The Coordinator-General

North Galilee Basin Rail Project

Terms of reference for an environmental impact statement

August 2013

Great state. Great opportunity.

Queensland Government

Contents

Introduction

The Coordinator-General has declared the North Galilee Basin Rail project to be a 'coordinated project' under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the Act, which requires a proponent to prepare an environmental impact statement (EIS) for the project. These terms of reference (TOR) set out the matters the proponent must address in an EIS for the project.

The Coordinator-General released the draft TOR for public and advisory agency comment from 13 July 2013 to 12 August 2013. A total of 24 submissions were received on the draft TOR, including 17 from state advisory agencies (5 of which made no comments) and regional councils, and seven from members of the public and other organisations. This TOR has been prepared having regard to submissions received.

This TOR must be read in conjunction with the *Preparing an environmental impact statement: Guideline for proponents*, which explains the following:

- the target audience for the EIS
- stakeholder consultation requirements
- document format
- copy requirements.

The guideline is available from **www.dsdip.qld.gov.au** or from the EIS project manager.

A full explanation of the EIS process under the SDPWO Act can be found at **www.dsdip.qld.gov.au/assessments-and-approvals/environmental-impact-statement-process.html**.

About the project

Adani Mining Pty Ltd (Adani) is the proponent for the North Galilee Basin Rail project (the project).

Adani proposes the construction and operation of an approximately 300-kilometre standard gauge rail line in Central Queensland, connecting the northern Galilee Basin to the Port of Abbot Point. The southern end of the rail line would connect with rail infrastructure being assessed as part of the Carmichael Coal Mine and Rail Project in the vicinity of Mistake Creek (west of Moranbah) and would run north to the Port of Abbot Point (near Bowen).

Operational capacity for the rail line will be in the order of 100 million tonnes per annum (Mtpa) to enable haulage of product coal from the proposed Carmichael Coal Mine and other third party users in the northern Galilee Basin.

Capital expenditure for the project is estimated at approximately AU$2.2 billion. The project is expected to require a peak workforce of up to 3800 people during construction over approximately two years. During operations, the project will require a workforce of approximately 125 people.

The project as presented in the project initial advice statement (IAS) (revision 0, dated 30 May 2013) consists of a broad (1000-metre-wide) investigative corridor, with the final rail alignment to be refined to a nominal 100-metre-wide corridor following consideration of environmental, social and geotechnical constraints.

For further information on the project, refer to the project IAS, which is available at: **www.dsdip.qld.gov.au/NGBR**

Australian Government assessment

On 27 June 2013, the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities (Commonwealth Environment Minister) determined the project constitutes a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cwlth) due to the project's potential impacts on matters of national environmental significance (MNES).

The Minister decided on 3 July 2013 to conduct a separate assessment process under the EPBC Act. The relevant controlling provisions under the EPBC Act are:

- World Heritage properties (sections 12 & 15A)
- National Heritage places (sections 15B & 15C)
- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)
- Commonwealth marine areas (sections 23 & 24A)
- Great Barrier Reef Marine Park (sections 24B & 24C)

This TOR does not relate to MNES.

Content of the EIS

The EIS should follow the format and content outlined in this TOR. Discuss any proposed change to the overall structure of the EIS documents with the EIS project manager.

For the purposes of the EIS process, ‘environment’ is defined in Schedule 2 of the SDPWO Act and includes social and economic matters.

Provide all geographical coordinates throughout the EIS in latitude and longitude against the Geocentric Datum of Australia 1994 (GDA94).

The detail at which the EIS deals with matters relevant to the project should be proportional to the scale of the impacts on environmental values. When determining the scale of an impact, consider its intensity, duration, cumulative effect, irreversibility, the risk of environmental harm, management strategies and offsets provisions.

Provide all available baseline information relevant to the environmental risks of the project. Provide details about the quality of the information provided, in particular: the source of the information; how recent the information is; how the reliability of the information was tested; and any uncertainties in the information.

Demonstrate how the construction, operation and decommissioning (to the extent known) of the project would be consistent with best practice environmental management. In general, the preferred hierarchy for managing likely impacts is: (a) to avoid; (b) to minimise/mitigate; and (c) if necessary, and possible, to offset.

The assessment and supporting information should be sufficient for the administering authority to decide whether an approval should be granted. Where applicable, sufficient information should be included to enable approval conditions to be drafted.

1. Executive summary

The executive summary should convey the most important and preferred aspects and options relating to the project in a concise and readable form. It should use plain English, avoid jargon, be written as a stand-alone document and be structured to follow the EIS. It should be easy to reproduce and distribute on request to those who may not wish to read or purchase the whole EIS.

The executive summary should include:

- the essential elements of the project description, including: title; proponent's name; a concise statement of the aims and objectives of the project; and detailed maps of the proposed location
- an outline of the need for the project, including the consequences of it not proceeding, a discussion of the alternative options considered and reasons for selecting the proposed development option
- a brief description of the project (pre-construction, construction, operational activities and decommissioning) and the existing environment, using visual aids where appropriate
- an overview of the principal environmental impacts predicted and the proposed mitigation strategies
- a summary of proponent's commitments
- the legal framework for the project, decision-making authorities and advisory agencies.

2. Glossary of terms

Provide a glossary of technical terms, acronyms, abbreviations and references.

3. Introduction

Clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. Include an overview of the structure of the document.

3.1. Project proponent

Describe the proponent's experience, including:

- the nature and extent of business activities
- experience and qualifications
- environmental record in Australia and internationally
- the proponent's environmental, health, safety and community policies.

3.2. Project overview

Briefly describe the key elements of the project with illustrations or maps. Summarise any major associated infrastructure requirements. Provide detailed project description as part of the requirements of Section 4 of this TOR (refer to page 5).

Briefly explain, using comparative analysis, how the project conforms to the objectives for 'sustainable development'—see the *National Strategy for Ecologically Sustainable Development* (Commonwealth of Australia 1992).

3.3. Project rationale

Describe the specific objectives and justification for the project, including its strategic, economic, environmental and social implications, technical feasibility and commercial drivers. Discuss the relative importance of the project in a regional, state and national context.

3.4. Relationship to other projects

Describe how the project relates to other major projects (of which the proponent should reasonably be aware) that have been, are being undertaken or that have been proposed or approved in the area potentially affected by the project. Projects for which information is publicly available and accessible prior to lodgement of the EIS for this project should be included in this assessment.

Discuss how any opportunities to co-locate existing or proposed infrastructure, enabling efficiency gains and mitigating environmental and property impacts, have been considered and adopted or rejected. Discuss the opportunities in sufficient detail to enable the reader to understand the reasons for preferring certain options or courses of action and rejecting others.

3.5. Project alternatives

Describe feasible alternatives including conceptual, technological and locality alternatives to the proposed project and the consequences of not proceeding with the project (including any impacts that would be avoided). Detail the criteria used to determine the alternatives and provide sufficient detail to convey why certain options or courses of action are preferred and why others are rejected (including the 'no action' option). Discuss the interdependencies of project components, particularly in regard to how any infrastructure requirements relate to the viability of the project.

3.6. The environmental impact assessment process

Provide an outline of the environmental impact assessment process, including the role of the EIS in the Coordinator-General's decision making process. The information in this section is required to ensure readers are informed of the process to be followed and are aware of any opportunities for input and participation.

Inform the reader how and when properly made public submissions on the EIS will be addressed and taken into account in the decision-making process.

3.7. Public consultation process

The public consultation process should provide opportunities for community involvement and education. It may include interviews with individuals, public communication activities, interest group meetings, printed material and other

mechanisms to encourage and facilitate active public consultation. The public consultation processes (community engagement) for all parts of the EIS should be integrated.

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

3.7.1. Consultation report

In addition to the statutory requirements for the proponent to undertake stakeholder consultation as per section 2.5 of *Preparing an environmental impact statement: Guideline for proponents* (Department of State Development, Infrastructure and Planning 2013a) including with resource tenure holders, an appropriate public consultation program is essential to the impact assessment process. The proponent should consult with local, State and Commonwealth government agencies, potentially affected local communities and interest groups.

The EIS should describe the consultation that has taken place and how the responses from the community and agencies have been incorporated into the design and outcomes of the project.

Include, as an appendix, a public consultation report detailing how the public consultation plan was implemented, and how the results of consultation have been considered by the proponent in the EIS process.

3.8. Project approvals

Identify Commonwealth, state and local legislation, approvals and plans relevant to the planning, approval, construction and operation of the project.

Provide detail on the statutory approvals under State and Commonwealth law that will be required for the project to proceed and that will be assessed by the EIS process

Outline the project's consistency with the existing national, state, regional and local planning framework that applies to the project location. Refer to all relevant statutory and non-statutory plans, planning policies, guidelines, strategies and agreements.

Provide an outline of each ERA under the *Environmental Protection Act 1994* (EP Act) and associated activities that are to be carried out in connection with the project. If conditions for ERA approvals are being sought as an outcome from the EIS process, present a detailed description of each ERA in Section 5, Environmental values and management of impacts. Provide details of the impact on land, water, air, noise and any other identified environmental values, as well as a detailed description of the waste generated from each ERA and its quantity, characteristics, handling, storage, management and intended treatment and disposal.

Technical advice on requirements for applications for an environmental authority regarding impacts on air, land, water, waste and noise issues is available at: **www.business.qld.gov.au/business/running/environment/licences-permits/applying-environmental-authority/technical-information-requirements.**

4. Project description

Describe the project through its lifetime of pre-construction, construction, operation and potential decommissioning.

The EIS must describe and illustrate at least the following specific information about the proposed project:

- a rationale for the project explaining the selection of the preferred operating scenario, including details such as cost, environmental impacts, and the operational efficiencies of each option
- a description of the key components of the project including the use of text and design plans where applicable
- the proposed tenure for the project area and the legal implications/requirements of this tenure
- a summary of any environmental design features of the project
- the expected cost, timing, and overall duration of the project, including details of and justification for, any staging of the development.

4.1. Location

Describe, using maps at suitable scales, the regional and local context of all project components and associated infrastructure. Provide real property descriptions of the project. Maps should show:

- the precise location of the project components and associated infrastructure
- state-controlled and local roads in the vicinity of the project
- existing rail infrastructure in the vicinity of the project
- the relationship of the project to existing and proposed infrastructure at the Port of Abbot Point.

Describe and illustrate any existing mineral resource, petroleum (including coal seam gas), geothermal and greenhouse gas tenures and licences overlying and adjacent to the project site, and any proposed applications required for this project.

4.2. Construction phase

Provide a detailed staging plan and approximate timeframes for the project's construction activities.

Provide an estimate of the number and roles of persons to be employed during the construction phase of the project.

Provide the following information on the pre-construction and construction of the project, including detailed plans, drawings and maps.

Describe all pre-construction activities, including nature, scale and timing of:

- land acquisitions required, be it in full or as easements, leases
- vegetation clearing
- site access

- earthworks
- interference with watercourses and floodplain areas, including wetlands
- site establishment requirements for construction facilities, including access measures, movement of materials and equipment, and expected size, source and control of the construction workforce accommodation, services (water, sewerage, communication, energy, medical, waste disposal, recreation) and safety requirements
- temporary works
- upgrade, relocation, realignment, deviation of or restricted access to roads and other infrastructure
- equipment to be used.

Describe all the construction elements of the project, including:

- an indicative construction timetable, including expected commissioning and start-up dates and hours of construction
- major work programs for the construction phase, including an outline of construction methodologies
- construction equipment to be used
- construction inputs, handling and storage including an outline of potential locations for source of construction materials
- hazardous materials to be transported, stored and/or used on site, including environmental toxicity data and biodegradability
- clean-up and restoration of areas used during construction, including camp site(s) and storage areas.

4.3. Operational phase

Provide full details of the operation for all elements of the project, including:

- a description of the project site, including concept and layout plans of buildings, structures, plant and equipment to be employed
- nature and description of all key operational activities including maintenance activities
- the capacity of the project equipment and operations
- estimated numbers and roles of persons to be employed during the operational phase of the project.

4.4. Associated infrastructure

Detail, with the aid of concept and layout plans, requirements for new infrastructure or upgrading/relocating existing infrastructure to service the project. Consider infrastructure such as transportation (road/rail/air/ship), water supply and storage, energy supply, telecommunications, stormwater, waste disposal and sewerage.

Describe:

- all infrastructure required to be constructed, upgraded, relocated or decommissioned for the construction and/or operation of the project, such as resource extraction areas, access roads including connections to public roads and proposed road/rail interfaces and treatments, power supply, connection to sewerage or water supply
- the design and construction standards to be met, for example:
  - waterway crossings should be designed to meet the requirements of the *Fisheries Act 1994* and self-assessable codes for minor or temporary water barrier works)
  - referrable water supply dams should be designed with regard to the referable dam provisions (Chapter 4) of the *Water Supply (Safety and Reliability) Act 2008*.
- alternative approaches or the opportunity to obtain materials from alternative sources.
- proposed water storage or distribution infrastructure, including the process and criteria used to select the preferred design and construction techniques
- the design and construction standards to be met for any infrastructure.

4.5. Decommissioning and rehabilitation

Present a plan for decommissioning and rehabilitating the site.

Refer to infrastructure that is not intended to be decommissioned. In this situation, describe the entity to which the infrastructure is intended to be transferred.

5. Environmental values and management of impacts

Detail the environmental protection and mitigation measures incorporated in the planning, construction, rehabilitation, commissioning, operations and decommissioning of all facets of the project. Measures should prevent, or if not possible, minimise environmental harm and maximise environmental benefits of the project. Identify and describe preferred measures in more detail than other alternatives.

Where negative impacts of the project cannot be avoided or adequately minimised or mitigated, present proposals to offset impacts in accordance with the Queensland Government Environmental Offsets Policy (Environmental Protection Agency 2008b) or any replacement whole-of-government Environmental Offsets Policy.

The mitigation measures and monitoring programs, identified in this section of the EIS, should be used to develop management strategies for the project. For more information, refer to Section 9 (page 28).

5.1. Climate and natural hazards

Describe the climatic conditions that may affect management of the project. This includes a description of the vulnerability of the project area to seasonal conditions, extremes of climate (for example, cyclones) and natural or induced hazards (including

bushfire). Provide a risk assessment (as part of the requirements of Section 7.1 of this TOR) and management plan detailing these potential climatic threats to the construction and operation of the project, including planning for response to flood damage of project infrastructure.

5.1.1. Flood management

A desktop assessment of the rail line and surrounding catchments must be undertaken and the potential for flooding qualitatively described. The desktop assessment must also identify any high-risk watercourse crossing or floodplain locations that warrant further detailed quantitative assessment.

For these locations, a comprehensive flood study must be included in the EIS that includes:

- quantification of flood impacts on properties surrounding and external to the project site from redirection or concentration of flows
- identification of likely increased flood levels, increased flow velocities or increased time of flood inundation as a result of the development.

The EIS should describe the consultation that has taken place with landholders along the alignment regarding modelled impacts of the project on flooding. Include discussion of how the results of consultation has, or will be, considered by the proponent in the EIS process.

The flood study should address any requirements of local or regional planning schemes for flood affected areas. The study report should include details of all calculations along with descriptions of base data and any potential for loss of flood plain storage. Reference must be made to any studies undertaken by the local council in relation to flooding.

5.2. Land

Detail the existing land environment values for all areas associated with the project. Describe the potential for the construction and operation of the project to change existing and potential land uses of the project sites and adjacent areas.

5.2.1. Land use and tenure

Description of environmental situation

Identify, with the aid of maps:

- land tenure, including reserves, tenure of special interest (such as protected areas and forest reserves), existing and proposed gas infrastructure, water pipelines, powerlines and transport corridors, including stock routes, local roads, state-controlled roads and rail corridors
- existing land uses and facilities surrounding the project, including reference to agricultural land uses current or likely to be undertaken in the project area as referenced in the *Queensland Agricultural Land Audit* (Department of Agriculture, Fisheries and Forestry 2013)

- location, boundaries, and area and size of the project footprint, including easement widths and access requirements
- distance of the project from residential areas (dwellings, residential allotments, mobile home/caravan parks or other residential premises) and recreational areas
- declared water storage catchments
- location of the project in relation to environmentally sensitive areas and any proposed buffers surrounding the project area (for construction and operation)
- areas covered by applications for native title claims or native title determinations, providing boundary descriptions of native title representative body(ies), and whether it is necessary to notify the representative body(ies) or if there is evidence that native title does not exist.

Potential impacts and mitigation measures

Describe the potential changes to existing and potential land uses due to the construction and operation of the project. In particular, describe the following:

- impacts on project site and adjacent land uses and human activities and strategies for mitigation, such as those required by state planning policies and local government planning schemes
- possible effect on town planning objectives and controls, including local government zoning and strategic plans
- constraints to potential developments and possibilities of rezoning adjacent to the development area
- management of the immediate environs of the project including construction buffer zones
- proposed land use changes in any areas of high conservation value and information on how easement widths and vegetation clearance in sensitive environmental areas will be minimised
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services
- any land units requiring specific management measures
- potential for native title rights and interests likely to be impacted upon by the project and the potential for managing those impacts by an Indigenous land use agreement or other native title compliance outcomes.

5.2.2. Scenic amenity and lighting

Description of environmental values

Describe, in general terms, the existing character of the landscape and the general impression that would be obtained while travelling through and around it. Outline existing landscape features, panoramas and views that have, or could be expected to have, value to the community. Include information such as maps and photographs.

Potential impacts and mitigation measures

Describe the potential beneficial and adverse impacts of the project on landscape character and visual qualities of the site and the surrounding area. Explain what measures will be undertaken to avoid or mitigate the identified impacts.

Provide an assessment of all potential impacts of the project's lighting, during all stages, with particular reference to objectives to be achieved and management methods and strategies to be implemented to avoid or mitigate, such as:

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

5.2.3. Topography, geology and soils

Description of environmental values

Provide maps locating the project in state, regional and local contexts. The topography should be detailed with contours at suitable increments, shown with respect to Australian Height Datum. Include significant features of the landscape and topography, and accompanying comments on the maps.

Describe the geological properties that may influence ground stability or the quality of stormwater leaving any area disturbed by the project. Where the geology is such that significant fossil specimens may be uncovered during construction/operations, address the potential for significant finds.

A desktop assessment of the soils environment should be undertaken with particular emphasis placed on identifying high risk sites which have the potential to be affected by the project. In these areas the soils must be described at a suitable scale, with particular reference to the expected physical and chemical properties of the materials that will influence erosion potential, stormwater run-off quality, rehabilitation and agricultural productivity of the land. Provide information on soil stability and suitability for construction of project facilities.

A desktop assessment should be undertaken to identify potential areas of acid sulfate soils. Where potential areas are identified, further investigations including field surveys should be undertaken in accordance with state planning policies and accepted industry guidelines.

Describe, map and illustrate soil types and profiles. Undertake an appraisal of the depth and quality of useable soil. Assess each soil's agricultural land suitability.

Provide an appraisal of geotechnical information on the soils' stability and suitability for construction of project facilities, including erosion potential, stormwater run-off quality, rehabilitation and agricultural productivity.

Identify any areas of land within the project study area identified as 'strategic cropping land or potential strategic cropping land' (SCL) as identified by the *Strategic Cropping Land Act 2011* (SCL Act) trigger maps.

For relevant sections of the project area, provide a map and description of relevant coastal geomorphology, characterised and supported by illustrative mapping.

Potential impacts and mitigation measures

Provide details of any potential impacts to the topography or geomorphology associated with the project and proposed mitigation measures.

Identify the possible soil erosion rate for all permanent and temporary landforms and describe the techniques used to manage the impact. Identify all soil types and outline the erosion potential (both wind and water). Include an assessment of likely erosion effects, especially those resulting from removing vegetation, and constructing retaining walls both on site and off site for all disturbed areas.

Identify erosion management techniques to be used. Provide details of an erosion monitoring program (including rehabilitation measures for erosion problems identified during construction), and detail acceptable mitigation strategies.

Discuss the potential for acid generation from disturbance of acid sulfate soils during earthworks and construction, and propose measures to manage soils and mitigate impacts for all site earthworks and construction activities. Should action criteria be triggered by acid generating potential as a result of testing potential areas, provide a site-specific acid sulfate soils management plan prepared in accordance with state planning policies and accepted industry guidelines.

Identify any areas within the project footprint likely to temporarily or permanently impact SCL and potential SCL. Where areas of identified SCL and potential SCL are likely to be permanently alienated by the project, address the requirements of the SCL Act as they apply to the components of the project, in consultation with the Department of Natural Resources and Mines to discuss undertaking the SCL assessment process defined by the SCL Act.

5.2.4. Land contamination

Description of environmental values

Detail any known or potential sources of contaminated land within or adjoining the project area, including the location of any potential contamination identified by landholders. Provide a description of the nature and extent of contamination at identified site(s).

Potential impacts and mitigation measures

Discuss the management of any contaminated land and potential for contamination from construction, commissioning, operation and decommissioning.

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 management of chemicals and fuels to prevent spills or leaks.

5.3. Coastal environment

Describe the existing coastal environment that may be affected by the project in the context of coastal values identified in the Queensland State of the Environment reports and environmental values as defined by the EP Act and environmental protection policies.

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* (Qld) (Coastal Act).

Assess the project's consistency with the relevant policies of the *Queensland Coastal Plan* (Department of Environment and Resource Management 2012a), including the Coastal Protection State Planning Regulatory Provision (SPRP) (Department of State Development, Infrastructure and Planning 2013b) and the State Policy: Coastal Management (Department of Environment and Resource Management 2011d).

Note that it is intended that the Coastal Protection SPRP will be replaced by the single State planning policy (single SPP) during 2013. Further information about the draft single SPP is available from the Department of State Development, Infrastructure and Planning at **www.dsdip.qld.gov.au/about-planning/state-planning-policy.html**.

5.4. Nature conservation

Detail the existing nature conservation values that may be affected by the proposal. Describe the environmental values in terms of:

- terrestrial and aquatic ecosystems and their interaction
- biological diversity, including habitat of endangered, vulnerable and near-threatened (EVNT) and special least-concern species
- integrity of existing ecological processes, including habitat of EVNT and special least-concern species
- integrity of landscapes and places including wilderness and similar natural places.

Surveys should be undertaken in those areas identified as key ecological areas during the desktop assessment. The survey effort should identify the existing flora and fauna values and the regional ecosystem associations that incorporate these values. The survey effort should be sufficient to identify, or adequately extrapolate, the floral and faunal values over the range of seasons, particularly during and following a wet season. The survey should account for the ephemeral nature of watercourses traversing the proposal area, and seasonal variation in fauna populations.

Wherever possible, seek the involvement of the local Indigenous community in conducting field observations and survey activities, to identify the traditional and contemporary Indigenous uses of species.

Also outline the proposed strategies to avoid, or minimise and mitigate, impacts on the identified values within the project's footprint.

Identify key flora and fauna indicators for ongoing monitoring where a clear need for ongoing management has been identified by the above assessment.

5.4.1. Sensitive environmental areas

Description of environmental values

On a map of suitable scale, identify areas that are environmentally sensitive within the study area in proximity to the project. This should include areas classified as having national, state, regional or local biodiversity significance, or flagged as important for their integrated biodiversity values. Refer to Queensland legislation and policies on threatened species and ecological communities. Areas regarded as sensitive with regard to flora, fauna and ecological processes should be identified and mapped.

Potential impacts and mitigation measures

Discuss the impact of the project on species, communities and habitat of local, regional or state significance in sensitive environmental areas as identified above.

Demonstrate how the project would comply with the following hierarchy:

- avoiding impact on areas of remnant vegetation and other areas of conservation value including the habitat of listed species
- mitigating impacts through rehabilitation and restoration
- replacing or offsetting the loss of conservation values, where impacts cannot be avoided or mitigated.

Describe and explain any departure from 'no net loss' of ecological values.

Discuss the boundaries of the areas impacted by the project within or adjacent to a threatened ecological community, including details of footprint width. If the project area will impact upon an endangered ecological community, include reasons for the preferred alignment and the viability of alternatives.

Describe strategies for protecting Ramsar wetlands and discuss any obligations imposed by state or Commonwealth legislation or policies, or international treaty obligations (that is, China–Australia Migratory Bird Agreement (CAMBA), Japan–Australia Migratory Bird Agreement (JAMBA), Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)).

Describe and assess the potential impacts of any actions of the project that require an authority under the *Nature Conservation Act 1992* (NC Act), and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*. The assessment and supporting information should be sufficient for the administering authority to decide whether an approval should be granted, and to develop conditions.

Management practices proposed for the project should address the performance requirements of the relevant policies and regional vegetation management codes.

Where Queensland legislation or policy requires an offset for a significant residual impact on a particular natural environmental value, the offset proposal(s) shall be consistent with the relevant legislation and policy.

5.4.2. Terrestrial flora

Description of environmental values

Provide vegetation mapping for all relevant project sites, and for adjacent areas to illustrate interconnectivity. Mapping should also illustrate any larger scale interconnections between areas of remnant or regrowth vegetation where the project site includes a corridor connecting those other areas. Discuss any variances between site mapping and mapping produced by the Queensland Herbarium.

Highlight sensitive or important vegetation types, including any marine littoral and subtidal zone and riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types.

For each significant natural vegetation community likely to be impacted by the project, vegetation surveys should be undertaken at an appropriate number of sites, allowing for seasonal factors, and satisfy the following:

- the relevant regional vegetation management codes
- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database and HERBRECS
- the minimum site size should be 10 × 50 metres
- a complete list of species present at each site should be recorded
- the surveys to include species structure, assemblage, diversity and abundance
- the relative abundance of plant species present to be recorded
- any plant species of conservation, cultural, commercial or recreational significance to be identified
- specimens of species listed as protected plants under the Nature Conservation (Wildlife) Regulation, other than common species, are to be submitted to the Queensland Herbarium for identification
- the methodology in *Biocondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland: Assessment Manual* (version 2.1) (Eyre et al. 2011) and *Ecological Equivalence Methodology Guidelines* (version 1) (Department of Environment and Resource Management 2011a) for sites possibly requiring offset considerations under the Policy for Vegetation Management Offsets (version 3) (Department of Environment and Resource Management 2011b) or Queensland Biodiversity Offset Policy (version 1) (Department of Environment and Resource Management 2011c).

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

Potential impacts and mitigation measures

Describe the potential environmental impacts to the ecological values of the area arising from the construction, operation and decommissioning of the project including clearing, salvaging or removing vegetation. Discuss the indirect effects on remaining

vegetation. Consider short- and long-term effects and comment on whether the impacts are reversible or irreversible.

For all components of the project, discuss:

- the potential impacts that clearing vegetation will have on listed species and communities in the extent of the proposed vegetation clearing
- any management actions to minimise vegetation disturbance and clearance
- the ability of identified vegetation to withstand any increased pressure resulting from the project, and any measures proposed to mitigate potential impacts
- 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
- any post-construction monitoring and auditing programs
- the potential environmental harm on flora due to any alterations to the local surface and groundwater environment, with specific reference to impacts on riparian vegetation or other sensitive vegetation communities
- a description of any foreseen impacts which increase the susceptibility of ecological communities and species to the impacts of climate change.

Outline how these measures will be implemented through proposed management practices for the project.

Weed management strategies are required for containing existing weed species (for example, parthenium and other declared plants) and ensuring no new declared plants are introduced to the area. Refer to the local government authority's pest management plan and any strategies and plans recommended for the project area by Biosecurity Queensland. Discuss the strategies in accordance with provisions of the *Land Protection (Pest and Stock Route Management) Act 2002* in the main body of the EIS and in a pest management plan within the proposed management practices for the project.

5.4.3. Terrestrial fauna

Description of environmental values

Describe the terrestrial and riparian fauna occurring in the areas affected by the proposal, noting the broad distribution patterns in relation to vegetation, topography and substrate.

Fauna survey methodology should be in accordance with the *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland* (Eyre et al. 2012).

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

- species diversity and abundance of animals of recognised significance
- any species that are poorly known but suspected of being rare or threatened
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement

- the existence of feral or introduced animals of economic or conservation significance
- existence (actual or likely) of any species and communities of conservation significance in the study area, including discussion of range, habitat, breeding, recruitment feeding and movement requirements, and current level of protection (for example, any requirements of protected area management plans or threatened species recovery plans)
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- an estimate of commonness or rarity for the listed or otherwise significant species
- use of the area by migratory fauna
- records in a form compatible with the Wildlife Online database.

Identify any species listed by the NC Act occurring in the project area. Identify any species listed by the 'Back on Track' species prioritisation methodology (refer to: **www.ehp.qld.gov.au/wildlife/prioritisation-framework/index.html**).

Indicate how well any affected communities are represented and protected elsewhere in the bio-region where the project occurs. Specify the methodology used for fauna surveys. Provide relevant site data to the Department of Environment and Heritage Protection (DEHP) in a format compatible with the Wildlife Online database for listed threatened species (refer to: **www.ehp.qld.gov.au/wildlife/wildlife-online/index.html**).

Potential impacts and mitigation measures

Describe potential impacts on terrestrial fauna, relevant wildlife habitat and other fauna conservation values, including:

- impacts due to loss of range/habitat, food supply, nest sites, breeding/recruiting potential or movement corridors or as a result of hydrological change
- impacts on native species, particularly species of conservation significance
- cumulative effects of direct and indirect impacts
- threatening processes leading to progressive loss
- a description of any foreseen impacts that increase the susceptibility of ecological communities and species to the impacts of climate change.

Address any actions of the project or likely impacts that require an authority under the NC Act. Provide the following information on mitigation strategies:

- measures to avoid and mitigate the identified impacts. Any provision for buffer zones and movement corridors, nature reserves or special provisions for migratory animals should be discussed and coordinated with the outputs of the flora assessment
- details of the methodologies that would be used to avoid injuring 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
- strategies for complying with the objectives and management practices of relevant recovery plans

- measures to rehabilitate disturbed areas, which incorporate provision of nest hollows and ground litter, where appropriate.

Outline how these measures will be implemented in the proposed management practices for the project.

Address feral animal management strategies and practices. Refer to the local government authority's pest management plan and any strategies and plans recommended for the project area by Biosecurity Queensland. Discuss the strategies in accordance with the provisions of the *Land Protection (Pest and Stock Route Management) Act 2002.* Any pest management plan is to incorporate strategies to manage designated pests as defined by the *Public Health Act 2005*.

5.4.4. Aquatic biology and ecology

Description of environmental values

Describe the aquatic flora and fauna present, or likely to be present, in the areas affected by the project, including marine species.

Describe any wetlands listed by DEHP as areas of national, state or regional significance and detail their values and importance for aquatic flora and fauna species.

Fauna—turtles

Describe the turtle species that may use beaches near the proposed development area.

Undertake a desktop review of information on the turtle communities of the study area, particularly the green, hawksbill, loggerhead, olive ridley and flatback turtles, paying specific attention to any anecdotal or recorded information on turtle populations frequenting the port area and any known nesting sites.

Refer to studies of the turtle populations and consult the Department of National Parks, Recreation, Sport and Racing on historical data for the area, particularly on previously conducted nesting surveys.

Use this information to develop recommendations on the most appropriate management measures to be adopted to minimise the risk of turtle injury or death.

Potential impacts and mitigation measures

Discuss the potential impacts of the project on the aquatic species and ecosystems and describe proposed mitigation actions, including:

- proposed location, type and design of waterway barrier works (temporary and permanent) that would impact on aquatic resources, particularly fish movement, with an appropriately scaled map
- proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that would restrict free movement of aquatic fauna
- alternatives to waterway crossings where possible

- measures to avoid fish spawning periods, such as seasonal construction of waterway crossings and measures to facilitate fish movements through water crossings
- offsets proposed for unavoidable, permanent loss of fisheries habitat
- methods to minimise the potential for introducing or spreading weed species or plant disease
- monitoring aquatic biology health, productivity and biodiversity in areas subject to direct discharge.

Address any actions of the project or likely impacts that require an authority under the relevant legislation, including the NC Act and/or the Fisheries Act. Outline how these measures will be implemented through proposed management practices for the project.

Provide details of the management methods which would avoid or minimise impacts on birds, marine mammals, turtles and fish, including migrations and marine plant propagation commensurate with the risk and severity of predicted impacts. In particular, present a discussion of existence (actual or likely) of any species and communities of conservation significance in the study area, including discussion of range, habitat, breeding, recruitment feeding and movement requirements, and current level of protection (for example, any requirements of protected area management plans or threatened species recovery plans, including, but not restricted to direct references to all relevant turtle species included in the *Recovery Plan for Marine Turtles in Australia* (Commonwealth of Australia 2003).

Outline how these measures will be implemented through proposed management practices for the project.

5.5. Water resources

5.5.1. Description of environmental values

Describe the existing resources and environmental values of surface water and groundwater as described under the EP Act (section 9) and the Environmental Protection (Water) Policy 2009 that may be affected by the project, including:

- physical, chemical and biological characteristics of existing surface and groundwater within the area that may be affected by the project
- existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses
- baseline details on water assets, including environments supported by those assets.

Describe the environmental values of the surface waterways and groundwater of the affected area in terms of:

- physical integrity, fluvial processes and morphology, including riparian zone vegetation and form, if relevant
- any proposed impoundment, extraction, use or loss of surface water or groundwater
- hydrology of waterways and groundwater
- sustainability, including both quality and quantity

- dependent ecosystems
- existing and other potential surface and groundwater users.

5.5.2. Potential impacts and mitigation measures

Assess the project's potential impacts on water resource environmental values identified in the previous section. Define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of objectives will be monitored, audited and managed. Include the following:

- potential impacts on the flow and the quality of surface and groundwater from all phases of the project, with reference to their suitability for the current and potential downstream uses and discharge licences
- an assessment of all likely impacts on groundwater depletion or recharge regimes
- potential impacts of surface water flow on existing infrastructure, with reference to the EPP (Water) and the *Water Act 2000*
- chemical and physical properties of any wastewater (including stormwater at the point of discharge into natural surface waters), and its potential environmental harm to terrestrial and aquatic ecosystems, flora and fauna
- an assessment of the potential to contaminate surface and groundwater resources and measures to prevent, mitigate and remediate such contamination.

Assess the hydrological impacts of the proposal on surface water and water courses, particularly with regard to stream diversions, scouring and erosion, and changes to flooding levels and frequency of flooding, both upstream and downstream of the project. If flooding levels will be affected, modelling of afflux should be provided and illustrated with maps.

Describe the options for supplying water to the project considering water resource availability and impacts on water users, and assess the consequential impacts in relation to any water resource plan and resource operations plan that may apply.

Identify any approval or allocation that would be needed under the Water Act.

Strategies should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained to nominated water quality objectives. Describe the monitoring programs that will assess the effectiveness of management strategies for protecting water resources during the construction, operation and decommissioning of the project. Outline how these strategies are incorporated into appropriate sections of proposed management practices and management plans.

5.6. Air quality

5.6.1. Description of environmental values

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 Environmental Protection (Air) Policy 2008 (EPP (Air)).

Discuss the existing local and regional air shed environment, including:

- background levels and sources of particulates
- any pollutants (including greenhouse gases)
- any baseline monitoring results, sensitive receptors.

Data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies.

5.6.2. Potential impacts and mitigation measures

Consider the following air quality issues and their mitigation:

- an inventory of air emissions from the project expected during construction and operational activities (including source, nature and levels of emissions)
- ground level predictions should be made at any site that includes the environmental values identified by the EPP (Air), including any sites that could be sensitive to the effects of predicted emissions
- dust and odour generation from construction activities, especially in areas where construction activities are adjacent to existing road networks or are in close proximity to sensitive receivers
- climatic patterns that could affect dust generation and movement
- vehicle emissions and dust generation along major haulage routes (including coal dust associated with rail haulage) both internal and external to the project site
- human health risk associated with emissions from project activities
- impacts on terrestrial flora and fauna.

Detail the best practice mitigation measures together with proactive and predictive operational and maintenance strategies that could be used to prevent and mitigate impacts.

Discuss potential air quality impacts from emissions, with reference to the National Environmental Protection (Ambient Air Quality) Measure 2003 (Cwlth) and the EPP (Air).

5.7. Greenhouse gas emissions

5.7.1. Description of environmental situation

Provide an estimate of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO_2 equivalent' terms for:

- scope 1 emissions
- scope 2 emissions.

Briefly describe method(s) by which estimates were made.

Use the *National Greenhouse Accounts (NGA) Factors* (Commonwealth of Australia 2012) as a reference source for emission estimates, supplemented by other sources where practicable and appropriate. As a requirement of the NGA factors, estimates should include the loss of carbon sink capacity of vegetation due to clearing and impoundment.

5.7.2. Potential impacts and mitigation measures

Discuss the potential for greenhouse gas abatement measures, including:

- the proposed measures (alternatives and preferred) to avoid and/or minimise direct greenhouse gas emissions
- how the preferred measures minimise emissions and achieve energy efficiency
- any opportunities to further offset greenhouse gas emissions through indirect means including sequestration and carbon trading.

5.8. Noise and vibration

5.8.1. Description of environmental values

Describe the existing noise and vibration environment that may be affected by the project in the context of the environmental values defined by the Environmental Protection (Noise) Policy 2008 (EPP (Noise)). Refer to the following documents:

- *Noise Measurement Manual* (Environment Protection Agency 2000)
- *Guideline: Noise and vibration from blasting* (Environmental Protection Agency 2006)
- *Guideline: Planning for Noise Control* (Environmental Protection Agency 2004)
- *Australian Standard AS 2187.2-2006 Explosives – Storage and Use, Part 2 Use of Explosives* (Standards Australia 2006).

Identify sensitive noise receptors adjacent to all project components and estimate typical background noise and vibration levels based on surveys at representative sites. Discuss the potential sensitivity of such receptors and nominate performance indicators and standards.

5.8.2. Potential impacts and mitigation measures

Describe the impacts of noise and vibration generated during the pre-construction, construction, operational and decommissioning phases of the project. Noise and vibration impact analysis should include:

- the levels of noise and vibration generated, including noise contours, assessed against current typical background levels, using modelling (such as Environmental Noise Model or SoundPLAN) where appropriate

- impact of noise, including low frequency noise (noise with components below 200 Hz) and vibration at all potentially sensitive receivers (for example, residences, social and public infrastructure, such as health, recreational and educational facilities, roads) compared with the performance indicators and standards nominated above in Section 5.8.1
- impact on terrestrial, avian and aquatic fauna
- proposals to minimise or eliminate these effects
- mitigation options for sensitive receptors that are otherwise unable to achieve a satisfactory internal noise level for the preservation of health and wellbeing as identified within the EPP (Noise).

In the evaluation of predicted noise and vibration impacts, consider the *Rail Infrastructure Noise Guideline* (Environment Protection Agency (NSW) 2013).

Night-time surface works

Provide details of any night-time surface work proposed. Specifically include:

- the reasons why night-time work may be undertaken (for example, to avoid peak traffic periods, or to undertake work in a rail corridor)
- the likely duration of work (if known)
- the proposed hours of the work
- the nature of the work to be undertaken
- the likely impact on residents and the associated mitigation measures to be undertaken by the proponent
- the methods that will be used to communicate with affected residents.

5.9. Waste

5.9.1. Waste generation

Identify and describe all sources, likely volumes and quality (where applicable) of waste associated with pre-construction, construction, operation and decommissioning of all aspects of the project. Refer to regulated waste listed in Schedule 7 of the Environmental Protection Regulation 2008 (Qld). Describe:

- waste generated by delivery of material to site(s)
- all chemical and mechanical processes conducted on the construction sites that produce waste
- the amount and characteristics of solid and liquid waste produced on site by the project
- hazardous materials to be stored and/or used on site, including environmental toxicity data and biodegradability.

5.9.2. Waste management

Detail the proposed management of solid and liquid waste. Assess the potential impact of all waste generated during construction and operation, with regard for best practice

waste management strategies, the Environmental Protection (Waste Management) Policy 2000 and *the Environmental Protection (Waste Management) Regulation 2000* (Qld). Provide details of each type of waste in terms of:

- the options available for avoidance and minimisation
- operational handling and destination of all waste including storage
- on-site treatment methods proposed for any waste
- methods of disposal (including the need to transport waste off site for disposal) proposed to be used for any trade, liquid or solid waste
- the potential level of impact on environmental values
- measures to ensure stability of the waste storage areas and impoundments
- methods to prevent seepage and contamination of groundwater from stockpiles, storage areas and impoundments
- measures to minimise attraction of vermin, insects and pests
- options available for using recycled materials
- market demand for recyclable waste (where appropriate)
- decommissioning of the construction site.

5.10. Transport

Present a transport assessment for each project-affected mode (road, rail and air) as appropriate for construction and operational phases of the project. The assessment report should provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by project transport at the local and regional level e.g. local roads and state-controlled roads.

5.10.1. Existing infrastructure

Describe the extent, condition and capacity of the existing transport infrastructure on which the project will depend.

5.10.2. Transport activities and routes

Freight

Provide a summary of all the freight tasks (inputs and outputs, including wastes) associated with all phases of the project.

Traffic generation

For each mode of transport and for the construction and operational phases of the project, provide traffic generation information on:

- existing background traffic including volumes, composition, peak traffic and peak times along the transport routes to and from the project
- background traffic growth for the transport routes for all stages of the project life
- the construction of any project-related plant and utilities within or impacting on the jurisdiction of any transport authority

- the stages, timing and duration of each stage/phase and how these impact on the transport-related infrastructure
- comparison of the traffic situation and road conditions with and without the project
- expected volumes of project inputs and outputs of transported raw materials, plant, construction materials and operational equipment, waste, hazardous goods and finished products for all phases of the project
- the movements of project inputs and outputs through the local and regional transport network (including number and type of vehicles, mode, volume, composition, trip timing and routes)
- traffic generated by workforce personnel including visitors (volume, composition, timing and routes)
- likely heavy, oversize and indivisible loads (volume, composition, timing and routes) highlighting any vulnerable bridges and structures along proposed routes.

Describe:

- access locations (existing and proposed) to state-controlled roads
- locations of proposed road-crossing points.

5.10.3. Potential impacts

Impact assessment reports should include details of the adopted assessment methodology (for impacts on roads: the road impact assessment report in accordance with the *Guidelines for Assessment of Road Impacts of Development*) (Department of Main Roads 2006). Assessment of traffic impacts is to include the transport arrangements for permanent and temporary workforce associated with all phases of the project.

Assess project impacts on:

- local and state-controlled road networks, including key road and road/rail intersections, at all project stages. Any impact to level crossings should be assessed using the Australian Level Crossing Assessment Model (ALCAM)
- existing rail infrastructure, with particular reference to any rail crossings and infrastructure at the Port of Abbot Point
- capacity, safety, local amenity, efficiency and condition of transport operations, services and assets from either transport or project operations, including an assessment of pavement life of the road network as a result of the project. Refer, where relevant, to the *Queensland Road Safety Action Plan 2013–2015* (Department of Transport and Main Roads 2013)
- possible interruptions to transport operations
- the nature and likelihood of product-spill to both land and marine environments during transport, if relevant
- driver fatigue for workers travelling to and from regional centres and key destinations

- any existing or proposed strategies for public passenger transport and active transport and address, where relevant, requirements of Part 2A of the Transport Planning and Coordination Act
- access to transport for people with a disability
- transport and handling of hazardous substances and dangerous goods
- the cumulative impact of this project adding to the impact of other known proposed or current major projects impacting on the road network.

5.10.4. Infrastructure alterations

Detail:

- any proposed alterations or new transport-related infrastructure and services required by the project (as distinct from impact mitigation works) including the potential need for interface agreements with rail transport operators and/or road authorities, where rail or road crossings are required
- construction of any project-related plant and utilities, within or impacting on the jurisdiction of any transport authority.

5.10.5. Transport impact management strategies

Discuss and recommend how identified impacts will be mitigated so as to maintain safety, efficiency and condition of each mode. These mitigation strategies are to be prepared in close consultation with relevant transport authorities (including local government).

Findings of studies and transport infrastructure impact assessments should be an input into preparing a transport management plan.

Road/rail management planning

Outline:

- procedures for assessing and agreeing on the scope of required mitigation works with road/rail corridor managers (for example, maintenance or upgrades), including any associated works, such as sourcing water and gravel
- strategies to minimise the effects of project transport on existing and future public road or rail corridors
- steps to be taken to prevent access from public roads/rail corridors to the project sites
- strategies to maintain safe access to public road/rail reserves to allow road/rail/pipeline maintenance activities
- process for decommissioning any temporary access to road/rail reserves, for example, stockpile sites.

Findings of studies and transport infrastructure impact assessments should be an input into preparing a draft road-use management plan. Conditions of approval for transport management impacts should also be detailed in the proposed management practices.

5.11. Indigenous cultural heritage

Unless an exemption applies under section 86 of the *Aboriginal Cultural Heritage Act 2003*, a Cultural Heritage Management Plan (CHMP) must be prepared in accordance with the requirements of Part 7 of that Act. The gazetted *Cultural Heritage Management Plan Guidelines* may assist in the development of the CHMP. The EIS project manager must be made aware of the progress of the CHMP approval process and of any related issues that should be addressed in the Coordinator-General's EIS evaluation report.

5.12. Non-Indigenous cultural heritage

Include a cultural heritage study/survey that describes non-Indigenous cultural heritage sites and places, and their values. Any such study should be conducted by an appropriately qualified cultural heritage practitioner.

Provide an assessment of any likely effects on sites of non-Indigenous cultural heritage values. Provide strategies to mitigate and manage any negative impacts on non-Indigenous cultural heritage values and enhance any positive impacts.

As a minimum, investigation, consultation, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care.

6. Social and economic

The construction and operation of the project should aim to meet the following objectives:

- avoid or mitigate adverse social and economic impacts arising from the project
- capitalise on opportunities potentially available to affected communities.

In accordance with the Coordinator-General's *Social impact assessment guideline*, (Department of State Development, Infrastructure and Planning 2013c) describe the likely social impacts (positive and negative) on affected communities taking into account proposed mitigation measures. The proponent should consult the office of the Coordinator-General about the application of social impact assessment, as it will vary on a case-by-case basis, depending on the duration and extent of potential impacts. The assessment should include, but not be limited to, the following key elements:

- community and stakeholder engagement
- workforce management
- housing and accommodation
- local business and industry content
- health and community wellbeing.

Describe the likely impacts (positive and negative) of the project on the economies materially impacted by the project. The analysis should describe both the potential and direct economic impacts including estimated costs, if material, on industry and the community.

The assessment should identify opportunities to capture the economic benefits of the project, including:

- strategies for ensuring local suppliers of goods and services receive full, fair and reasonable opportunity to tender for work throughout the life of the project through adopting policies such as the Queensland Resources and Energy Sector Code of Practice for Local Content administered by Queensland Resources Council
- employment strategies for local residents including members of Indigenous communities and people with a disability
- opportunities to support the tourism industry
- any recruitment and training programs to be offered.

7. Hazard and risk

7.1. Hazard and risk assessment

Describe the potential hazards and risks to people and property that may be associated with the project, which may include but are not restricted to:

- identifying potential hazards, accidents, spillages, fire and abnormal events that may occur during all stages of the project, including possible risk of occurrence
- identifying all hazardous substances to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards, natural events (for example, cyclone, storm surge, flooding, bushfire) and implications related to climate change
- assess how the project may potentially affect hazards away from the project site (for example changing flooding characteristics).

Undertake a preliminary risk assessment for all components of the project, as part of the EIS process in accordance with relevant standards.

Provide details on the safeguards that would reduce the likelihood and severity of hazards, consequences and risks to persons, within and adjacent to the project area(s).

Present a comparison of assessed and mitigated risks with acceptable risk criteria for land uses in and adjacent to the project area(s).

7.2. Health and safety

Describe the existing health and safety values of the community, workforce, suppliers and other stakeholders in terms of the environmental factors that can affect human health, public safety and quality of life, such as air pollutants, odour, lighting and amenity, dust, noise and water.

Define and describe the objectives and practical measures for protecting or enhancing health and safety community values.

Assess the cumulative effects on public health values and occupational health and safety impacts on the community, workforce and regional health services from project

operations and emissions. Recommend any practical monitoring regimes in this section.

Include relevant consultation undertaken with the appropriate regional health service providers and emergency management authorities.

7.3. Emergency management plan

The development of emergency and evacuation planning and response procedures is to be determined in consultation with state and regional emergency service agencies, including commitments to consult with Local and District Disaster Management Groups.

Provide an outline of the proposed integrated emergency management planning procedures (including evacuation plans, if required) for the range of situations identified in the risk assessment developed in this section. This includes strategies to deal with natural disasters during operation and construction including identification of key stakeholders.

8. Cumulative impacts

Summarise the project's cumulative impacts and describe these impacts in combination with those of existing or proposed project(s) publicly known or advised by the office of the Coordinator-General to be in the region, to the greatest extent practicable. Assess cumulative impacts with respect to both geographic location and environmental values. In particular, address cumulative impacts in sensitive environmental areas identified in section 5.4.1 of this TOR (refer to page 13).

Explain the methodology used to determine the cumulative impacts of the project, detailing the range of variables considered (including relevant baseline or other criteria upon which the cumulative aspects of the project have been assessed, where applicable).

9. Commitments and management practices

Provide a consolidated list detailing all proponent commitments to implement management measures (including any monitoring programs) relevant to the project and its potential impacts. Commitments to environmental performance may be included in the Coordinator-General's evaluation report as conditions, to ensure the commitments are met.

Provide detail of the management practices proposed to prevent or minimise adverse impacts associated with each phase of the project. The management practices must address discrete project elements and provide life-of-project control strategies.

Management practices must be based on investigations undertaken during the EIS process and the findings presented in the EIS document; management practices proposed should be commensurate with the risk and severity of predicted impacts. Proposed management practices may be collated to produce a consolidated management plan.

Detail how the project area will be rehabilitated after each relevant activity ceases.

Include details of any site management plan that relates to the proposed project area, including performance criteria and implementation strategies.

10. Conclusions and recommendations

Make conclusions and recommendations with respect to the project, based on the studies presented, mitigation measures and management practices proposed, and conformity of the project with legislative and policy requirements.

11. References

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

12. Appendices

Provide the following as appendices to the EIS:

- final TOR for this EIS
- TOR cross-reference table, which links the requirements of each section/Section of the TOR with the corresponding section/Section of the EIS, where those requirements have been addressed
- a list of the project approvals required by the project
- the consultation report, as described in Section 3.7 (page 3)
- a list of the relevant qualifications and experience of the key study team members and specialist sub-consultants
- a glossary of technical terms
- a list of abbreviations
- any reports of specialist studies undertaken as part of the EIS
- a copy of the proponent's corporate environmental policy and planning framework document
- a list of all commitments made by the proponent in the EIS, with cross-references to the relevant section in the EIS
- a copy of the proponent's land acquisition protocols.

Acronyms and abbreviations

Acronym/abbreviation	Definition
CAMBA	China–Australia Migratory Bird Agreement
CHMP	cultural heritage management plan
Coastal Act	*Coastal Protection and Management Act 1995* (Qld)
DEHP	Department of Environment and Heritage Protection, Queensland
EIS	environmental impact statement
EP Act	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPP	environmental protection policy (water, air, waste, noise)
ERA	environmentally relevant activity
JAMBA	Japan–Australia Migratory Bird Agreement
MNES	matters of national environmental significance (under the EPBC Act)
Mtpa	million tonnes per annum
NC Act	*Nature Conservation Act 1992* (Qld)
NGA	National Greenhouse Accounts
NT agreement	native title agreement
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SCL Act	*Strategic Cropping Land Act 2011* (Qld)
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
The proponent	Adani Mining Pty Ltd
TOR	terms of reference

Glossary

Term	Definition
afflux	A flow to or toward an area.
Australian Height Datum	A mapping system applied to Australia, which uses a datum, or agreed level, from which the heights of naturally occurring features can be measured; this level, to which the value of zero is given, is equivalent to the mean sea level for 1966–68 at thirty tide gauges around the coast of the Australian continent.
biodiversity	Biodiversity is short for 'biological diversity'. It describes the natural diversity of native wildlife, together with the environmental conditions necessary for their survival and includes: a) regional diversity, that is, the diversity of the landscape components of a region, and the functional relationships that affect environmental conditions within ecosystems b) ecosystem diversity, that is, the diversity of the different types of communities formed by living organisms and the relations between them c) species diversity, that is, the diversity of species d) genetic diversity, that is, the diversity of genes within each species.
community	An assemblage of interdependent populations of different species (plants and animals) interacting with one another, and living in a particular area.
controlled action	A proposed action that is likely to have a significant impact on a matter of national environmental significance; the environment of Commonwealth land (even if taken outside Commonwealth land); or the environment anywhere in the world (if the action is undertaken by the Commonwealth). Controlled actions must be approved under the controlling provisions of the EPBC Act.
controlling provision	The matters of national environmental significance, under the EPBC Act, that the proposed action may have a significant impact on.
coordinated project	A project declared as a 'coordinated project' by the Coordinator-General, under section 26 of the SDPWO Act.
Coordinator-General	The corporation sole constituted under section 8A of the *State Development and Public Works Organisation Act 1938* and preserved, continued in existence and constituted under section 8 of the SDPWO Act.
CORVEG	Queensland Herbarium's site based floristic dataset containing field survey data
ecosystem	A biophysical environment containing a community of organisms.
ephemeral	Transitory, short-lived.

endangered	A species is endangered if: • there have not been thorough searches conducted for the wildlife and the wildlife has not been seen in the wild over a period that is appropriate for the life cycle or form of the wildlife, or • the habitat or distribution of the wildlife has been reduced to an extent that the wildlife may be in danger of extinction, or • the population size of the wildlife has declined, or is likely to decline, to an extent that the wildlife may be in danger of extinction, or • the survival of the wildlife in the wild is unlikely if a threatening process continues.
erosion	The process by which rocks are loosened, worn away and removed from parts of the earth's surface.
fluvial	Of, relating to, or inhabiting a river or stream.
groundwater	Water found underground in porous rock or soil strata.
habitat	The biophysical medium or media occupied (continuously, periodically or occasionally) by an organism or group of organisms.
listed species	A plant or animal included in a schedule of vulnerable, rare or endangered biota, such as the schedules in the EPBC Act or the Nature Conservation (Wildlife) Regulation 2004 (Qld).
mitigation	The effort to eliminate or reduce impacts.
morphology	Form and structure of organisms without consideration of function.
native species	A species that is indigenous to Australia or an external territory, or periodically or occasionally visits.
native wildlife	Any taxon or species of wildlife indigenous to Australia.
natural environment	The complex of atmospheric, geological, and biological characteristics found in an area in the absence of artefacts or influences of a well-developed technological human culture.
proponent	The entity or person who proposes a coordinated project. It includes a person who, under an agreement or other arrangement with the person who is the existing proponent of the project, later proposes the project.
regional ecosystems	Regional ecosystems were defined by Sattler and Williams (1999) as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.
regrowth	A young, usually even-aged forest stand that has regenerated after disturbance.
rehabilitation	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat.
remnant vegetation	Vegetation, part of which forms the predominant canopy of the vegetation: • covering more than 50 per cent of the undisturbed predominant canopy • averaging more than 70 per cent of the vegetation's undisturbed height • composed of species characteristic of the vegetation's undisturbed predominant canopy.
riparian	Pertaining to, or situated on the bank of, a body of water, especially a watercourse such as a river.
riparian zone	Located alongside a watercourse.

run-off	The amount of rainfall which actually ends up as stream flow, also known as rainfall excess.
sediment	Any usually finely divided organic and/or mineral matter deposited by air or water in non-turbulent areas.
sensitive receptor	Those locations or areas where dwelling units or other fixed, developed sites of frequent human use occur.
terrestrial	Pertaining to land, the continents, and/or dry ground. Contrasts to aquatic.
water asset	Water, or the rights or other claims to water, which the water report entity either holds, or for which the water report entity has management responsibilities, and from which an individual or organisation that is a water report entity, or a group of stakeholders of a physical water report entity, derives future benefits (as defined in Exposure Draft of Australian Water Accounting Standard 1 (2010)—Water Accounting Standards Board)

References

Commonwealth of Australia 1992, *National Strategy for Ecologically Sustainable Development*, Ecologically Sustainable Development Steering Committee, Canberra, viewed 7 June 2012, <http://www.environment.gov.au/about/esd/publications/strategy/index.html>.

——2003, *Recovery Plan for Marine Turtles in Australia*, Marine Species Section, Approvals and Wildlife Division, Environment Australia, Canberra, viewed 5 June 2012, <http://www.environment.gov.au/coasts/publications/turtle-recovery/index.html>.

——2012, *National Greenhouse Accounts (NGA) Factors—July 2012*, Department of Climate Change and Energy Efficiency, Canberra, viewed 7 January 2013, <http://www.climatechange.gov.au/publications/greenhouse-acctg/national-greenhouse-factors.aspx>.

Department of Agriculture, Fisheries and Forestry 2013, *Queensland Agricultural Land Audit,* Department of Agriculture, Fisheries and Forestry, Brisbane, viewed 16 August 2013, <http://www.daff.qld.gov.au/environment/queensland-agricultural-land-audit>

Department of Environment and Resource Management 2011a, *Ecological Equivalence Methodology Guideline: Policy for Vegetation Management Offsets*, version 1, Department of Environment and Resource Management, Brisbane, viewed 26 March 2013, <http://www.ehp.qld.gov.au/management/environmental-offsets/pdf/ecological-equivilance-methodology.pdf>.

——2011b, Policy for Vegetation Management Offsets, version 3, Department of Environment and Resource Management, Brisbane, viewed 6 September 2012, <http://www.ehp.qld.gov.au/management/environmental-offsets/pdf/policy-for-vegetation-management-offsets.pdf>.

——2011c, Queensland Biodiversity Offset Policy (version 1), Department of Environment and Resource Management, Brisbane, viewed 6 September 2012, <http://www.ehp.qld.gov.au/management/environmental-offsets/pdf/biodiversity-offset-policy.pdf>.

——2011d, State Policy: Coastal Management, Department of Environment and Resource Management, Brisbane, viewed 6 September 2012, <http://www.ehp.qld.gov.au/coastalplan/pdf/qcp-web-coastal-management.pdf>.

——2012a, *Queensland Coastal Plan*, Department of Environment and Resource Management, Brisbane, viewed 6 September 2012, <http://www.ehp.qld.gov.au/coastalplan/pdf/qcp-web.pdf>.

Department of Main Roads 2006, *Guidelines for Assessment of Road Impacts of Development*, Department of Main Roads, Brisbane, viewed 26 March 2013, <http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Guidelines-for-assessment-of-road-impacts-of-development.aspx>.

Department of State Development, Infrastructure and Planning 2013a, *Preparing an environmental impact statement: Guideline for proponents,* Department of State Development, Infrastructure and Planning, Brisbane, viewed 19 August 2013, <http://www.dsdip.qld.gov.au/resources/guideline/cg/eis-guideline-for-proponents.pdf>.

——2013b, *Coastal Protection State Planning Regulatory Provision: Protecting the coastal environment*, Department of State Development, Infrastructure and Planning, Brisbane, viewed 19 August 2013, <http://www.dsdip.qld.gov.au/resources/factsheet/planning/coastal-protection-sprp.pdf >.

——2013c, *Social impact assessment guideline*, Department of State Development, Infrastructure and Planning, Brisbane, viewed 19 August 2013, <http://www.dsdip.qld.gov.au/resources/guideline/social-impact-assessment-guideline.pdf>.

Department of Transport and Main Roads 2010, *Queensland Road Safety Action Plan 2013–2015*, Department of Transport and Main Roads, Brisbane, viewed 16 August 2013, <http://www.tmr.qld.gov.au/Safety/Road-safety/Strategy-and-action-plans.aspx>

Environmental Protection Agency 2000, *Noise Measurement Manual*, 3rd edn, Department of Environment and Resource Management, Brisbane.

——2004, *Guideline: Planning for Noise Control*, Environmental Protection Agency, Brisbane, viewed 6 September 2012, <http://www.ehp.qld.gov.au/register/p01369aa.pdf>.

——2006, *Guideline: Noise and vibration from blasting*, Environment Protection Agency, Brisbane, viewed 26 March 2013, <http://mines.industry.qld.gov.au/assets/explosives-pdf/noise-vibration-blasting.pdf>.

——2008b, Queensland Government Environmental Offsets Policy, Environmental Protection Agency, Brisbane, viewed 6 September 2012, <http://www.ehp.qld.gov.au/register/p02501aa.pdf>.

Environment Protection Agency (NSW) 2013, *Rail Infrastructure Noise Guideline*, Environment Protection Agency, viewed 20 June 2013, <http://www.environment.nsw.gov.au/resources/noise/20130018eparing.pdf>.

Eyre, TJ, Ferguson, DJ, Hourigan, CL, Smith, GC, Mathieson, MT, Kelly, AL, Venz, MF and Hogan, LD, 2012, *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland*, Department of Science, Information Technology, Innovation and the Arts, Brisbane, viewed 29 November 2012, <http://www.ehp.qld.gov.au/ecosystems/biodiversity/fauna-survey.html>.

Eyre, TJ, Kelly, AL, Neldner, VJ, Wilson, BA, Ferguson, DJ, Laidlaw, MJ and Franks, AJ 2011, *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland: Assessment Manual*, version 2.1, Department of Environment and Resource Management, Biodiversity and Ecosystem Sciences, Brisbane, viewed 17 July 2012, <http://www.ehp.qld.gov.au/ecosystems/biodiversity/pdf/biocondition_manual.pdf>.

Standards Australia 2006, *Explosives – Storage and Use*, *Part 2 Use of Explosives* (AS 2187.2-2006), Standards Australia, Sydney.

The Coordinator-General
PO Box 15517, City East Qld 4002
tel 13 QGOV (13 74 68)
fax +61 7 3225 8282
info@dsdip.qld.gov.au

www.dsdip.qld.gov.au