i-METT (Integrated Motorsport, Education, Tourism and Technology) Project

Terms of Reference for an Environmental Impact Statement

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

The Coordinator-General

September 2008

Queensland the Smart State

Queensland Government
Department of Infrastructure and Planning

Project and process information

Project proponent

The proponent for the i-METT project is i-METT Queensland Group Pty Ltd.

The contact details for the proponent are:
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Project summary

i-METT proposes to redevelop over 400 hectares of rural land, during a five year period, into a master planned development consisting of an integrated motorsport, education, tourism & technology precinct at Gilberton on the Gold Coast.

i-METT is a multifunctional project, centred around a mix of facilities and technologies. It is proposed to be developed on a botanic park foundation integrating a comprehensive urban village development. An international standard motorsport facility, hotel, theme park, television and technology facility, educational institute and museum, is to be incorporated into a village style complex. The project also has the capacity to consider community-based motorsport opportunities to cater for a growing number of enthusiasts both locally and regionally.

The precinct is expected to use computing, media, communications and control technologies and will have two principal aims:

- the first will be to cater for the paying public and house the botanic park, stadium, motor sport event facilities, educational institute, hotel, museum, television studios, control rooms and theme park; and
- the second will be to cater for automotive and precinct-associated-functions, by providing training, facilities and services to advance the use of up-to-date technologies in South East Queensland in particular, and Australia in general.

The Initial Advice Statement (IAS), prepared by the proponent, provides further information relating to the project.

Relationship with other projects

The Department of Infrastructure and Planning is undertaking a land use, economic development and infrastructure study (North East Gold Coast Study) jointly with the Gold Coast City Council and the Logan City Council for the area bounded by the Logan River, the M1 Motorway, the urban footprint boundary in the south and the coastline in the east. The outcomes of this study will feed into the review of the South East Queensland Regional Plan, due for completion in 2009.

The EIS must reference the North East Gold Coast study, discuss the relationship between the project and the study and take into account any outcomes of the study.

Administrative procedures for these terms of reference

On 15 February 2008, the Coordinator-General (CG) declared that the project is 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* (SDPWO Act). Pursuant to this Act, the CG establishes appropriate Terms of Reference (ToR) to guide the proponent through the necessary studies leading to the preparation of a comprehensive EIS for the project.

The Department of Infrastructure and Planning (DIP) is managing the EIS process on behalf of the CG. DIP has invited relevant Queensland and local government representatives and other relevant authorities to participate in the process as Advisory Agencies.

The first step in the impact assessment process is the development of ToR for an EIS for the project to satisfy the requirements of the SDPWO Act. A draft ToR was made available for public and Advisory Agency comment. In finalising the ToR, the CG had regard to all properly made submissions received on the draft ToR.

This document represents the 'final' ToR.

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 appear in relevant newspapers circulating in the district and state. The notice will provide: a description of the project, where copies of the EIS are available for inspection and the date for closure of submissions.

Arising from this review process, the proponent may be requested to provide a response to the comments received on the EIS and to make any consequential changes to the project to address the comments through a Supplementary EIS Report.

At the completion of the EIS phase, the CG will prepare a report evaluating the EIS and other relevant material, pursuant to Section 35 of SDPWO Act. In preparing this report, the CG may determine that the project may not proceed, may proceed without conditions or recommendations, or proceed subject to recommendations and specific conditions of development to manage adverse impacts associated with the project.

With respect to any subsequent development application for a material change of use or requiring impact assessment under the *Integrated Planning Act 1997* (IPA) for the project, the EIS process under Part 4, Division 4 of the SDPWO Act:

- replaces the information and referral stage and the notification stage under the Integrated Development Assessment System (IDAS) of the IPA;
- means that until the development approval applied for has effect, the CG's Report is taken to be the concurrence agency's response under IDAS (i.e. there are no concurrence agencies); and
- provides that properly made submissions received in relation to the EIS are taken to be 'properly made submissions' under the IPA.

The CG's Report may state for the assessment manager one or more of the following:

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

Alternatively, the report must state for the assessment manager:

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

Where another Act (for example *Environmental Protection Act 1994*) requires the preparation of an EIS, or similar statement to address the environmental effects of the project, this EIS can be taken as a statement satisfying those requirements. Where approval is required under

another Queensland Act, the CG's Report may recommend to the person, who will consider an approval required for the project, that:

- approval for the project be refused; or
- stated conditions are imposed on the approval.

Alternatively, the CG's Report may recommend that there are no conditions to be attached to any approval given under another Act.

Where the ToR are addressed for a particular stage of the process under Section 32 of the SDPWO Act, the proponent should identify the particular stage and the ToR addressed for that stage.

A copy of the CG's Report will be provided to the Planning Minister who is required to make a decision under section 1.4(e)(ii) of the South East Queensland Regional Plan Regulatory Provisions whether or not to exempt the proposed development from the Regulatory Provisions.

Results of consultation on these terms of reference

Submissions on the draft ToR were received from the following Agencies, as well as from private individuals, corporations and other groups:

- Queensland Department of Primary Industries and Fisheries; Mines and Energy; Housing; Employment and Industrial Relations; Tourism, Regional Development and Industry; Emergency Services; Sport and Recreation; Main Roads; and Natural Resources and Water;
- Queensland Transport; Queensland Treasury; Queensland Health; Queensland Police Service; and Environmental Protection Agency; and
- Gold Coast City Council.

The Project Manager for further enquiries is:

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Project Manager – i-METT Project

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Part A – Information and advice on the preparation of the Environmental Impact Statement (EIS)

1 Introduction

These Terms of Reference (ToR) for an EIS for the i-METT (Integrated Motorsport, Education, Tourism and Technology) Project ('the project') are in accordance with the requirements of the *State Development and Public Works Organisation Act 1971* (SDPWO Act).

These ToR identify those matters that should be addressed, as a minimum, in the EIS.

These ToR should not be interpreted as excluding from consideration any matters that: are currently unforeseen; may arise during ongoing scientific studies; or may arise from any changes in the nature of the project during the preparation of the EIS, the community consultation process and associated documentation.

The nature and level of investigations should be relative to the anticipated project benefits and likely extent and severity of impacts. The Coordinator-General (CG) may request additional information on any matter not adequately dealt with in the EIS. The proponent is required to contact relevant government agencies and peak bodies representing particular areas of interest in the wider community to clarify the required nature and level of investigations.

Reference to any culturally sensitive confidential information should be indicative only. Disclosure of any such information must be negotiated with traditional custodians. Other confidential information supplied by or to the proponent must be clearly identified and placed in discrete attachments to the main report, together with a statement of confidentiality.

An executive summary should be provided in the EIS and be available separately for public information.

2 EIS objectives

The objectives of the EIS are:

- to provide information about the project;
- to provide the justification of the project;
- to assess alternatives to achieve the project objectives stated in the IAS;
- to identify potential environmental, social and economic impacts and to ensure that any potentially adverse impacts are avoided or mitigated and managed where possible;
- to identify potential community benefits, including environmental, social and economic benefits;
- to identify all necessary licences, and planning and environmental approvals.

Potential direct, indirect and cumulative impacts of the project, during both its construction and operation, must be comprehensively identified and examined. For each potential impact identified in this study, strategies to avoid or to mitigate and manage the impact are required. The EIS should be a stand-alone and comprehensive document containing sufficient information to make an informed decision on the potential impacts and on the adequacy of the strategies identified to avoid or manage them. The document should provide:

- For interested bodies and persons:
  - a basis for understanding the project;
  - alternatives for the proposed project reference design;
  - the existing environment that it would affect, both on and off the site, and in relation to other major social and engineering infrastructure coordination;
  - the impacts that may occur;
  - the measures to be taken to mitigate all adverse impacts; and
  - possible legislative approvals and delivery mechanisms;

- For groups or persons with rights or interests in land:
  - an indication of project impacts on that land, including access, and measures to mitigate identified adverse impacts; and

- For the CG and Advisory Agencies, a framework against which to:
  - consider the economic, social and environmental aspects of the project in view of legislative and policy provisions and decide whether the project can proceed or not;
  - set conditions for approval, as appropriate, to seek to achieve economically, socially and environmentally sustainable development; and
  - where necessary, recommend an environmental management and monitoring program.

The proponent must identify and address, as fully as possible, the matters relevant to the project in addressing the ToR.

3 EIS preparation guidelines

The key principle is that there should be sufficient detail presented in the EIS to enable readers to identify and understand the benefits and to balance those against the impacts of the project on the natural, social, economic and built environment, including existing infrastructure. Readers are likely to include representatives of State and local governments, special interest groups and the general public. The EIS should contain sufficient information to avoid the need to search out previous or additional reports.

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

The level of analysis and detail in the EIS should reflect the level of significance of the expected benefits to and impacts on the environment.

The EIS should identify the anticipated life of the project and additional information on options for the on-going management of the project, where reasonable, taking into account the current planning phase of the project.

The EIS should identify reasonable economic and technically achievable measures to ensure that the adverse impacts of the project are limited to acceptable levels and that the benefits are captured.

The EIS should include analysis of any cumulative benefits and impacts on economic, social and environmental values directly caused by the project. The cumulative benefits and impacts of the project must be considered over time and in conjunction with other major projects, approved and known to be proceeding at the time of commencement of operations of the project.

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

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

All uncertainties in the assessment and assumptions made should be clearly stated. 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 should be presented.

The terms “describe”, “detail” and “discuss” should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate. Within these ToR the term “project” includes all activities and ancillary works undertaken on lands related to the project.

Should the proponent require any information about the project to remain confidential, such information should be made available, where appropriate, for the consideration of the Coordinator-General.

Copies of the prepared EIS should be lodged with the CG for distribution for comment and review during the public review period. In addition, an electronic version of the EIS is to be provided to the CG to be made available through the CG’s web site or through a link to a web site maintained by the proponent or its consultants. The final nature and number of EIS copies required to be submitted and made available, should be discussed and agreed with the CG at a relevant time during the EIS process. Copies of the EIS should also be prepared for distribution to relevant libraries and other key government offices. Documents are to be made available in both CD-ROM and hard copy format, at a cost not exceeding the cost of reproduction and should also be made available on-line where possible.

While every attempt has been made to ensure that these ToR address all of the major issues associated with this project, they are not necessarily exhaustive and should not be interpreted as excluding from consideration matters deemed to be significant or matters currently unforseen, that emerge as important or significant during scientific studies, from public consultation, or otherwise, during preparation of the EIS.

4 Advisory agency consultation

To facilitate the assessment process, the proponent (i-METT Queensland Group Pty Ltd) should consult with Advisory Agencies and other appropriate stakeholders as required during the EIS process. The purpose of this consultation will be in part to identify legislation, policies and methodologies relevant to the assessment of the proposed project.

Advisory Agencies should include but are not limited to:

Department of Communities (DoC) and Disability Services Queensland (DSQ)

Department of Education, Training and the Arts (DETA)

Department of Emergency Services (DES)

Department of Employment and Industrial Relations (DEIR)

Department of Housing (DoH)

Department of Infrastructure and Planning (DIP)

Department of Local Government, Sport and Recreation (DLGSR)

Department of Main Roads (DMR)

Department of Mines and Energy (DME)

Department of Natural Resources and Water (NRW)

Department of the Premier and Cabinet (DPC)

Department of Primary Industries and Fisheries (DPIF)

Department of Tourism, Regional Development and Industry (DTRDI)

Environmental Protection Agency (EPA)

Queensland Health (QH)

Queensland Police Service (QPS)

Queensland Rail (QR)

Queensland Transport (QT)

Queensland Treasury (Treasury)

Gold Coast City Council (GCCC)

All agencies consulted during the EIS process should be listed in the EIS.

5 General style and format

The EIS should be written so that any conclusions reached can be independently assessed. This means that all sources must be appropriately referenced. The EIS should be written in a format matching the ToR or include guidelines, preferably as an appendix, describing how the EIS responds to the ToR. The EIS is to include a draft outline of an Environmental Management Plan (EMP) as a framework for addressing potential environmental impacts during both the construction and operational phases of the project.

The EIS should also include appendices containing:

- a copy of the ToR;
- a consultation report that lists the persons and agencies consulted during the EIS; and
- the detailed specialist studies that support the main EIS document.

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

6 Terms of Reference glossary

The following abbreviations and terms have been used in this document:

CG - The Coordinator-General

CPM Act – *Coastal Protection and Management Act 1995*

DES - Department of Emergency Services

DIP - Department of Infrastructure and Planning

DMR - Department of Main Roads

DNRW - Department of Natural Resources and Water

DPIF - Department of Primary Industries and Fisheries

EIS - Environmental Impact Statement

EMP - Environmental Management Plan

EPA - Environmental Protection Agency

EPP - Environmental Protection Policy

IPA – *Integrated Planning Act 1997*

NC Act – *Nature Conservation Act 1992*

QT – Queensland Transport

The project – the i-METT project

SDPWO Act – *State Development and Public Works Organisation Act 1971*.

Study area – site location and surrounding areas impacted

ToR – Terms of Reference

VM Act – *Vegetation Management Act 1999*

PART B – Specific requirements – Contents of the EIS

Executive summary

The executive summary should be written as a stand-alone document, able to be reproduced on request for interested parties who may not wish to read the EIS as a whole. Though focused on the key issues, the structure of the executive summary should follow that of the EIS, allowing the reader to obtain a clear understanding of the project, its environmental, social and economic implications and management objectives. Using maps diagrams and photographs where appropriate, the summary should include:

- the title of the project;
- name and contact details of the proponent and the proponent's commitment to effective environmental management;
- a concise statement of the aims and objectives of the project;
- approvals required and the legal framework, decision-making authorities and involved agencies;
- a discussion of the background to, the need for, and the justification of the project, including the consequences of not proceeding with the project;
- a discussion of the alternative options assessed and the criteria leading to the choice of the project reference design;
- a brief description of the project for each of the pre-construction, construction and operational activities, and the existing environment into which the project will be placed;
- a brief discussion of the relationship between the project and other known major planning studies or projects in the vicinity of the study area;
- a summary of relevant, projected population, employment, travel and congestion indicators which will demonstrate the traffic and transport need for the project;
- an outline of the principal economic, social and environmental benefits and impacts predicted and proposed management strategies and commitments to minimise the significance of potentially adverse impacts; and
- a summary of the results of public consultation and public attitudes to the project.

Glossary of terms

A glossary of technical terms, acronyms and references 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. The introduction should define the audience for whom the EIS is intended and contain an overview of the structure of the document.

1.1 The proponent

This section is to describe the proponent in terms that are relevant to the proposed project and to outline the experience, the nature and extent of business activities, the environmental record and the environmental policies of the proponent.

1.2 Purpose of the EIS

The purpose and role of the EIS are to be outlined, including the EIS's role in providing inputs to the development of concepts and the preliminary design of the project, its purpose in guiding the project to compliance with regulatory requirements, and responding to the ToR. The objectives of the EIS should be to:

- provide public information on the need for and likely effects of the project on the natural, social and economic environment;
- set out acceptable standards and levels of impact (both beneficial and adverse) on environmental values; and
- demonstrate how these impacts can be managed.

The audience should be able to distinguish the EIS as the key environmental document providing information to decision-makers considering approvals for the project.

1.3 The EIS process

This section should provide an explanation of the legislative process under which the EIS is being produced, including timing and decisions to be made for relevant stages of the project.

The explanation should include a description of the EIS process in relation to a 'significant project' pursuant to the SDPWO Act, and any other government approvals or permits required as part of the project. It should include information on the relevant stages of the approvals process, statutory and public consultation requirements and any interdependencies that exist between the approvals sought.

The information in this section is required to ensure:

- relevant legislation is addressed;
- readers are informed of the process to be followed; and
- the Stakeholders are aware of any opportunities for input and participation.

Linkages between State and any Commonwealth legislation should be identified, where relevant.

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

1.4 The public consultation process

The EIS should report on the consultation program conducted with community members and other stakeholders through the study period. Where possible, the EIS consultation process should be consistent with the Queensland Government's "Engaging Queenslanders" guide. The full details of consultation should be provided in an appendix. Objectives for consultation should include:

- to ensure community members, businesses and organisations in the study area and other stakeholders have access to information to allow their informed consideration of the project's potential issues, benefits and impacts;

- to ensure the consultation process enables participation by people and organisations who have an interest (including but not limited to, residents and small businesses likely to be affected by the project) in the study's outcomes;
- to provide regular and transparent communication between the proponent and community members and stakeholders, throughout the study;
- to ensure community values, local knowledge and other input are considered in the assessment, design processes and development of mitigation measures;
- to demonstrate how the issues raised by stakeholders and the community generally are addressed; and
- to contribute to the development of a project that addresses community concerns and values, and maximises opportunities for local and regional community benefit.

Consultation commencing as early as possible in the EIS process is encouraged, with feedback provided to participants about outcomes.

As part of the consultation process, the proponent should consider the formation of a community reference group with relevant community representative associations and direct community representation, if appropriate. A summary of discussions/outcomes of this group should be included in the EIS.

The EIS should particularly report on consultation with direct stakeholders having an identifiable interest in the project outcomes.

The EIS should report the extent to which the public consultation program satisfied the requirements under the SDPWO Act.

The findings of the consultation program should be shown in the EIS, including the groups, agencies, and people who have been consulted, the issues they raised and the strategies, or proposed strategies, undertaken or proposed to address concerns or enhance particular benefits of the project.

1.5 Project approvals

1.5.1 Relevant legislation and policy requirements

The section should identify permits, licences and approvals required for the project.

This section must describe and list Commonwealth and state legislation and local policies relevant to the planning, approval, construction and operation of the project. Triggers for the application of each of these must be discussed and relevant approval requirements identified.

A brief explanation of the scope and legislative basis for the EIS must be provided, including the role of the EIS in the Government's decision making process and an explanation of the relationship between Part 4 of the SDPWO Act and the IDAS of the IPA with regard to the Project.

Relevant Australian Government legislation may include, among other things:

- *Environment Protection and Biodiversity Conservation Act 1999;*
- *Native Title Act 1993*;
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1994*; and
- other relevant Commonwealth obligations such as protection of World Heritage values, migratory animals (CAMBA, JAMBA and Bonn Convention) and wetlands of international importance (Ramsar).

Reference must also be made but not limited to the:

- *Environmental Protection Act 1994;*
- *Integrated Planning Act 1997;*
- *Land Act 1994;*
- *Marine Park Act 2004;*
- *Fisheries Act 1994 (and Fisheries Regulation 1995); and*
- other relevant Queensland laws.

Local Government planning controls, local laws and policies applying to the development must be described, and a list provided of the approvals required for the project and the expected program for approval of applications.

This information is required to assess how the legislation applies to the project, which agencies have jurisdiction, and whether the proposed impact assessment process is appropriate.

1.5.2 Planning processes and standards

This section is to 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 must refer to all relevant State and regional planning policies. Specific attention must be provided to demonstrating the project's consistency with the Gold Coast City Council Planning Scheme, relevant State Planning Policies (whether draft or final) including State Planning Policy 1/92 "Development and Conservation of Agricultural Land", the South East Queensland Regional Plan and the South East Queensland Infrastructure Plan and Program. The section must detail:

- any planning controls, by-laws and policies relating to the study area and adjacent lands;
- details of all licences, planning and environmental approvals required;
- regional strategies or plans that relate to the study area or Project (existing or in preparation);
- other plans such as the Gold Coast City Council's Regional Facilities and Development Plan 2006 and the Gold Coast City Council Off-road Motorcycle Plan 2002; and
- relationship to other significant developments (existing or proposed) in the study area or surrounding areas.

The EIS must address the compatibility of the proposal with the principles and policies of the South East Queensland Regional Plan and Regulatory Provisions. In regards to the Regulatory Provisions, due to the nature and scale of the proposal within the Regional Landscape and Rural Production Area, the EIS should include an assessment of the proposal against section 2.5(h) i.e. the 'locational requirements or environmental impacts' that necessitate its location outside the Urban Footprint and an overriding need in the public interest for the proposed development.

2 Background and project rationale

This section is to provide the justification for the project, feasible alternatives for the project, and a discussion of the consequences of not proceeding with the project.

2.1 Background

The background leading to the project proposal should be provided. It should include general information about the project in the local, regional and strategic context.

2.2 Project need and alternatives

This section must discuss all components of the proposal in the context of regional and local development and market potential, and the existence of similar developments at these levels.

The discussion needs to include identification and assessment of alternatives as well as demonstration of need from a social and economic perspective and demand from a market perspective.

2.2.1 Project justification

The justification for the project must be described, with particular reference made to the economic and social benefits, including employment and spin-off business development, which the project may provide. The status of the project should be discussed in a regional, State and national context.

The demonstration of need and demand must be a comprehensive assessment with consideration of relevant local, regional, state and national plans including the Gold Coast City Council Planning Scheme; the South East Queensland Regional Plan and Regulatory Provisions; and the South East Queensland Infrastructure Plan and Program.

The South East Queensland Regional Plan Regulatory Provisions state that the applicant for a material change of use must establish –

> *(a) the overall social, economic and environmental benefits of the material change of use weighed against–*
> *(i) any detrimental impact upon the natural values of the site; and*
> *(ii) conflicts with the desired outcomes of the Regional Plan, especially in relation to promoting consolidation of development within the Urban Footprint and preventing land fragmentation in the Regional Landscape and Rural Production Area or Investigation Area; and*
>
> *(b) that the community would experience significant adverse economic, social or environmental impacts if the material change of use proposal were not to proceed.*

This assessment should be included in the EIS to help determine if the material change of use could reasonably be located within the Urban Footprint and is in the public interest.

The detailed assessment should also include:

- an assessment of the demographic profile for the region and locally, provides the basis for arguing need based on community characteristics;
- estimated population and growth trends including age profiles;
- building investment;
- labour force, employment (by occupation and income);

- any other economic indicators to indicate support for the development;
- justification for the scale of the development proposed within the local, regional, national and international context;
- suitability for the location proposed;
- educational needs;
- short, medium and long term demands for community services (including Local and State Government services), employment access, and recreation that are not provided by the proposed development should be clearly identified along with their implications for future development in the area;
- the site in regional, national and international context – proximity to major centres, transport facilities – airstrips, train stations, road access;
- the site in the local context – role (size, facilities and services);
- justification for this project to proceed in view of potential world-wide oil shortages; and
- the impact on existing motor sport precincts and events in South East Queensland.

A comparative analysis of how the project conforms to the objectives for "ecological sustainable development" (see the National Strategy for Ecologically Sustainable Development (1992) available from the Australian Government Publishing Service) and other relevant policy instruments such as the "standard criteria" as defined by the EP Act should be presented here in the EIS. A life-of-project perspective should be shown. This information is required to demonstrate that sustainable development aspects have been considered and incorporated during the scoping and planning of the proposal.

The EIS should include details of compatible projects/activities which may be suitable for co-location within or nearby the proposed i-METT site. The EIS should provide details on how these may be progressed within the scope of the project.

The EIS should include an assessment of the extent to which the development of the project is consistent with the outcomes of the North East Gold Coast Study (currently being prepared by the Department of Infrastructure and Planning).

2.2.2 Alternatives to the project

The EIS must outline the basis for selection of the Gilberton location. It must describe any feasible alternatives to the project, as well as the alternative of not proceeding with the project. The assessment of alternatives needs to demonstrate that the Gilberton location is a suitable location for a multi-purpose facility of the proposed elements and scale considering the major costs and benefits, including environmental and social costs and benefits and the local and regional scale. These alternatives must be discussed in sufficient detail to make clear the reasons for pursuing the Gilberton option.

Alternatives considered may include:

- the 'no project' option;
- alternative locations;
- alternative master planning and site arrangements;
- larger or smaller scale development;
- locating separate elements of the proposal in alternative locations;
- alternatives for infrastructure and essential service provision, including the range of options considered for access, water, electricity, and waste management;
- use of land as a carbon sink;

- other options for diversification of sugar cane to support the sugar cane industry, e.g. mulches and garden products;
- alternative use of the land to support the local farmers, e.g. organic grains and industrial hemp.

The reasons for choice of the preferred option must be explained, including a comparison of the adverse and beneficial effects (both to the environment and community) used as a basis for selection, and compliance with government policy and with the principles and objectives of ecologically sustainable development (ESD).

This section must describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project. Alternatives must be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Comparative environmental impacts of each alternative must be summarised.

The interdependencies of the project components must be explained, particularly in regard to how each of any developments, or various combinations of components, and any infrastructure requirements relate to the viability of the components and the project as a whole. This section must include a description of and rationale for infrastructure associated including water supply, power, transport and storage infrastructure.

Reasons for selecting the preferred options must include technical, commercial, social and natural environment aspects.

3 Project description

The objective of this section is to describe the project through its lifetime. This information is required to allow assessment of all aspects of the life of the project including all phases of the project through planning, construction and long-term operation.

Describe in detail all components/precincts of the proposal.

3.1 Project development

The EIS is to provide a description of the locations that were assessed in the development of the project. Location options should be discussed in sufficient detail to enable an understanding of the criteria for the selection of the preferred location in terms of technical, commercial, social and/or environmental aspects.

The EIS is to provide and illustrate a description of each element of the project. Any major associated infrastructure requirements should also be summarised.

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

Relevant illustrations, maps, diagrams and drawings that show the location and context of the assessed options should be provided.

3.2 Location

3.2.1 The site

A brief overview of the project site must be presented, showing existing natural and human made features (including existing infrastructure and improvements) and relevant named locations. Maps and rectified aerial photographs must be included as necessary to illustrate the site.

Site context must also be discussed in terms of distances from nearby urban centres and other key locations of the region.

3.2.2 Regional context

The regional context of the project is to be described and illustrated on maps at suitable scales.

3.2.3 Local context

The local description of the project site must include real property descriptions. Maps at suitable scales must show the precise location of the project area, and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the Project area is or will be subject;
- the location and boundaries of the project footprint;
- the road network servicing the area including road names;
- the location of any proposed buffer areas or buffer zones surrounding the project's working areas;
- the local government boundary; and
- the location of environmentally sensitive receptors potentially affected by the development

such as residences, remnant vegetation on and off the site, natural water, erosion prone areas, wetlands, significant dune systems, extent of marine vegetation and essential habitat for rare and threatened species.

These features must be overlain on rectified aerial photographs (in separate outline and infill maps) to illustrate components of the project in relation to the natural and built features of the area.

3.2.4 Land tenure

Describe the Native Title status of the site.

Maps at suitable scales must be provided showing the precise location of the project area, and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the project area is or will be subject, including adjoining land tenure and/or legislative boundaries;
- the location and boundaries of the project footprint, including development necessarily occurring as a consequence of approval of the proposed development, showing all key aspects including excavations, stockpiles, areas of fill, crossings and built structures within waterways including all services infrastructure, plant locations, water storages, buildings, bridges, culverts, hardstands, car parks, etc;
- the location of any proposed buffers surrounding the working areas;
- lands identified for mitigation, either through retention in their current natural state or to be rehabilitated;
- details of any proposed road closures within the project area or adjacent to the project area; and
- provide details of any proposed areas set aside for public open space and proposed tenure and management arrangements for this land.

Sufficient survey data should be provided to accurately (0.5 metre) define the location of the boundaries and the area subject to development or set aside for conservation purposes, and to allow correction of the cadastre (DCDB) if required.

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

Details of the final tenure of the land following development including details of future reconfigurations, Community Title, Body Corporate Management and Conservation Covenants/Agreements, Reserves or Nature Refuges over the land and including a supporting plan, for the entire site. Such details should include:

- the nature and structure of any future reconfigurations or the tiered body corporate arrangements to be established for the various components of the development, including the private road system;
- further information concerning proposed legal arrangements for the governance of the site and the ability of the managing entity to:
  - manage the development, and manage the operational infrastructure and delivery of services at all stages through to completion of the project, including provision for ownership changes;
  - set standards and control the design and finish of structures and roads;
  - manage traffic;
  - manage the production of interpretative material and signage;
  - control and condition access to manage visitor impacts; and

- prevent future vegetation destruction, pollution and pest incursion into waterways;

- the general terms to form an agreement for the protection and maintenance of the private open space areas, and in particular, the areas to be retained under native vegetation; and
- a statement clearly defining the responsibility (if any) of Council or any other State agency in on-going maintenance of infrastructure established within or outside the area.

3.3 Construction

The nature of the project's construction at each stage must be described to the greatest extent possible. The description is required to describe the construction of each component of the project and associated facilities, including:

- expected size, source and control of the construction workforce accommodation, services (water, sewage, communications, power, recreation) and safety requirements;
- the types of construction equipment expected to be used and the numbers of plant to be transported onto the construction site;
- transport infrastructure requirements for construction and transportation/material logistics;
- location and construction material and equipment storage and servicing facilities;
- materials fabrication works (e.g. concrete batching plants), details of air, water and waste emissions;
- construction standards, techniques, and project management, including construction staging, and the location of sensitive residential and commercial premises during each stage of construction;
- the sources, quantities, transport and storage of construction materials on and off-site;
- the nature, scale and timings for earthworks, including any borrow pit or quarry requirements (and the potential to disturb acid sulfate soils);
- likely scenarios for origin and destination of inputs/supply source and likely transport routes;
- the nature, scale and timings for vegetation clearance, with cross-references to the vegetation types;
- an outline of overall environmental site management arrangements (dust and other air emissions, noise, runoff, erosion, earth stabilisation, aquifer dewatering, acid sulfate soils, spills, fire, disposal of wastes, effluent, heritage and cultural sites, emergencies, rehabilitation of construction areas);
- estimates of the quantity of freshwater required for construction purposes and the sources from which this water will be obtained;
- diversion of watercourses, watercourse crossings and arrangements for draining or directing or capturing overland flow during construction;
- if blasting is to be used, provide justification for this activity and a detailed management plan; and

- estimates of construction workers (permanent and temporary and dependants), contractors, movements, travel arrangements and composition, expected sources and local availability of employees.

Any staging of the project must be described and illustrated showing site boundaries, development sequencing and timeframes. The estimated numbers of people to be employed in the project construction phase must also be provided with a brief description of the skills required.

A detailed discussion of alternative construction methodologies and recommended methodologies, justified in terms of minimising adverse impacts on water quality, terrestrial biodiversity and the community must also be described.

3.4 Operations

The location and nature of the processes to be used should be described in the text and illustrated with maps, diagrams and artist's impressions as required. Operational issues to be addressed should include, but may not be limited to:

- a description of plant and equipment to be employed;
- the capacity of plant and equipment, and
- chemicals to be used.

Concept and layout plans should be provided highlighting proposed buildings, structures, plant and equipment.

Provide details about the scope, scale, type and frequency of events (including motor racing and other purposes) proposed for the facility. Provide details as to how these events will managed.

Identify the type of motor racing events the precinct will be capable of hosting.

3.5 Infrastructure requirements

3.5.1 Description of existing environment

Describe the current infrastructure in the vicinity of the project area. The matters to be considered include such infrastructure as roads, rail, bridges, jetties, ferries, tracks and pathways, dams and weirs, bore fields, power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

3.5.2 Potential impacts and mitigation measures

3.5.2.1 Transport – Road / Rail / Ship

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 must address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure.

Provide details of proposed use of rail for transport of materials, products or wastes to or from the project site.

Provide details of any shipping of products, the number if ships and their size.

New road infrastructure requirements

The EIS must detail any proposed new or alterations to road infrastructure required by the project. This includes access from the project to public roads, road realignments, grade-separated crossings, level crossings, road upgrades, bridges, access roads, and associated civil works. Details of the proposed timing of these works are also to be provided. Details of any future proposed infrastructure provisions identified by the Queensland Government or Gold Coast City Council which are related to the development or any of its activities are also to be provided.

Assessment of project traffic impacts on existing infrastructure

The EIS must provide sufficient information to make an independent assessment of how the State-controlled and local government road networks will be affected at the local and regional level.

The assessment of road impacts is to be presented in a Road Impact Assessment (RIA) section or separate report if necessary, prepared by the proponent in close consultation with the Queensland Department of Main Roads and other road authorities.

The RIA report is to provide full information about project-generated traffic for construction and operational phases such as:

- the expected volumes of project inputs and outputs (types and quantities) with reference to their origin, destination and routes used for transport, including plant, raw materials, wastes, hazardous materials, finished products and so on;
- the volume of traffic generated by workforce personnel, visitors and service vehicles; method of transport (including vehicle types and number of vehicles likely to be used); anticipated times at which movements may occur and likely routes; and
- details of vehicle traffic and transport of heavy and oversize/ indivisible loads (including types and composition); and the proposed transport routes including waterway crossings.

The RIA report will also:

- include details of methodology adopted such as:
  - a summary of consultation undertaken;
  - the agreed outcomes with relevant transport authorities regarding the scope of the RIA; and
  - the assessment process and impact mitigation strategies proposed to be adopted.
- be in accordance with Main Road's 'Guidelines for Assessment of Road Impacts of Development 2006', available on the Main Roads website: http://www.mainroads.qld.gov.au;
- clearly and logically detail all base data assumptions, including current condition of the road network and its performance;
- clearly describe the methodology used to assess impacts on the road network, justifying base data assumptions and certainty of results;
- describe potential impacts of project traffic on road safety, infrastructure (pavements, bridges and so on) and traffic efficiency (at intersections and mid-block) for both the construction and operational phase of the project;
- provide details on possible interruptions to traffic as a result of the project e.g. requirements for temporary access onto the road network for works or ongoing servicing of plant; and
- assess impacts on existing or proposed pedestrian and cycle networks.

Provide an assessment of any public transport requirements of the development in terms of existing transport networks and frequency of services and the requirement for provision of additional facilities within/near the development.

Mitigation of project traffic impacts

The RIA will also discuss how project impacts on the road network will be mitigated so as to maintain safety and efficiency.

Mitigation strategies are to be detailed in a Road-Use Management Plan, prepared by the proponent in close consultation with the Department of Main Roads and other road authorities.

The Road-Use Management Plan will:

- include details of methodology adopted such as:
  - a summary of consultation undertaken;
  - the agreed outcomes with relevant transport authorities regarding the scope of the RIA; and
  - the assessment process and impact mitigation strategies proposed to be adopted.
- consider Department of Main Roads future upgrades of the road network which may affect the study area;
- detail impact mitigation strategies, referencing relevant road authority standards and practices. (Any required road works should be designed and constructed in accordance to Department of Main Roads' "Road Planning and Design Manual 2004"); and
- provide timing and responsibilities for any required road works and additional transport infrastructure. (Traffic management issues for any required road works and any approvals under the *Transport Infrastructure Act (Qld) 1994* may be finalised in a Traffic Management Plan at the project pre-construction stage).

The Road-Use Management Plan is also to provide information on product spill contingency plans and the adequacy of equipment and facilities to deal with possible spills for the transport modes of the project if applicable. Indicate whether there is a need to update existing plans based on increase in frequency of traffic and volumes to be transported.

Road affects on the natural environment

Details of the impacts on the natural environment of any new roads, realignments or other road works should be provided.

Public transport

The EIS should:

- provide details of what bus infrastructure will be provided within the development and how the internal road network will cater for buses.
- provide details of the internal pedestrian and cycle networks and how these will connect with any surrounding pedestrian or cycle networks.
- demonstrate how public transport, walking and cycling will be encouraged within the precinct and be given priority over private vehicles.
- provide details of how public transport facilities can be provided onsite at little or no cost to taxpayers.
- provide details of how public transport usage will be encouraged for both employees and visitors to the site.
- provide an assessment of likely origins/destinations of transport trips (to ascertain total travel generation, degree of self-containment, trip characteristics, and so on).
- provide an estimate of the average daily public transport movements to the site on non-event days and an estimate of the average public transport movements to the site on event days.

- discuss the possibility of utilising a bus service or light rail service to provide access to the site from Ormeau Station or the future North Ormeau Station as an alternative to a new station.
- provide details of the arrangement for private vehicle parking on-site and an estimate of the number of private vehicle parks required.
- provide further details in relation to transport impacts of the proposal including:
  - the different uses within the site;
  - the hours of operation for each of the uses;
  - the expected sequencing of development;
  - an estimate of the population for both the entire development and each of the uses at any time;
  - a breakdown of the population of the site in terms of visitors vs. employees;
  - an indication of the demographics of people who will be using the site; and
  - how often each different type of event will occur and the expected population numbers on these days.
- provide details of the generation of additional vehicle kilometres travelled.
- provide information on the capacity of the existing transport system infrastructure and services to allow for the additional trips generated by the proposed development.
- assess the need for augmentation of existing infrastructure and services and/or provision of new infrastructure and services.
- assess the impacts on other parts of the transport network (including opportunity costs if State resources are diverted to serve this locality at the expense of resourcing infrastructure and services to other localities within the urban footprint).
- provide details of how the proposed light rail network would operate, what fare structure would be utilised, and who would be responsible for ongoing maintenance.
- provide details of who would be responsible for the construction and ongoing maintenance of the proposed new rail station.

The EIS should provide an assessment of the vulnerability of the development (and users of the development) to fuel price rises and potential supply disruptions (representative scenarios to be explored).

The EIS should provide an assessment of transport-related greenhouse gas emission implications during construction (including on and off site materials processing and transport). Refer also to Section 4.4.2 (greenhouse gas emissions and abatement).

The EIS should include a comprehensive transport analysis of the impact of the proposed new station required to service the site and on existing services within the Gold Coast rail corridor.

Provide details of any concessional public transport proposals (e.g. show entrance ticket for free travel).

Other transport modes

The EIS should discuss other modes of transport which may be used for the project, e.g. use of planes and helicopters for transporting personnel and broadcasting teams etc. Potential impacts from these modes should be discussed.

Provide details of airfields, storage and refuelling requirements.

3.5.2.2 Energy

Describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the proposal. The locations of any easements should be shown on the infrastructure plan. Energy conservation should be described in the context of any Commonwealth, State and local government policies.

3.5.2.3 Water supply and storage

Provide information on water usage by the project, including the quality and quantity of all water supplied to the site. In particular, the proposed and optional sources of water supply should be described (e.g. bores, any surface storages such as dams, weirs and rainwater tanks, municipal water supply pipelines).

Estimated rates of supply from each source (average and maximum rates) should be given. Any proposed water conservation and management measures should be described.

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.

Describe the implementation of integrated water cycle management principles and provisions. Reference is to be made to the Gold Coast Water Futures Strategy.

The EIS should address matters under the *Water Supply (Safety and Reliability) Act 2008* that are described in guidelines found under "Regulating the Water Industry" on the DNRW web site www.nrw.qld.gov.au.

3.5.2.4 Stormwater drainage

Describe the proposed stormwater drainage system and the proposed disposal arrangements, including any off-site services.

The EIS must detail the sources of stormwater and the quantity, quality and location of discharge to watercourses. Details should be provided to demonstrate that the proposed stormwater treatment systems will maintain natural drainage flow paths and flow volumes. The EIS must also detail the likely impact of drainage flows into water courses in terms of both hydrological and ecological implications on the aquatic and fisheries resources and any localised erosion and/or adverse impact at the discharge point and downstream. Provide details on the standard of stormwater treatment systems, including examples of quality improvement devices (sediment removal, gross pollutant traps) and potential discharge points (spread of flow and scour protection).

3.5.2.5 Sewerage

Describe, in general terms, the sewerage infrastructure required by the project. Provide detailed information on:

- the options proposed for wastewater treatment;
- the peak design capacity evaluation of the wastewater treatment system and associated infrastructure using equivalent persons;
- determination of the potential emergency effluent storage that would be required in an extended rain event (50 and 100 year ARIs);

- the proposed disposal and/or reuse of the treated effluent and the management of such use. Provide an irrigation plan detailing where the use of treated effluent is likely. Provide details of the likely impacts of treated effluent on groundwater quality;
- the siting and maintenance regime for the system; and
- treated effluent quality, particularly nutrient content; and treated effluent flow rates and volume available at different development stages.

If it is intended that industrial effluent or relatively large amounts of domestic effluent are to be discharged into an existing sewerage system, an assessment of the capacity of the existing system to accept the effluent should be provided in Section 4.5 '*Waste*'. For industrial effluent, this should include detail of the physical and chemical characteristics of the effluent(s).

3.5.2.6 Telecommunications

Describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

Provide details of proposed telecommunication facilities for the project. Locations of facilities, details of costs and proposed service providers are to be included.

3.5.2.7 Accommodation and other infrastructure

Describe any other developments directly related to the project not described in other sections, such as:

- camps, or temporary residential developments;
- fuel storage areas;
- equipment hardstand and maintenance areas
- provision of temporary parking; and
- technical workshops and laboratories.

3.6 Waste

3.6.1 Character and quantity of waste material

Provide an inventory of all wastes to be generated by the proposal during the construction, operational and decommissioning phases of the project. In addition to the expected total volumes of each waste produced, include an inventory of the following per unit volume of product produced:

- the tonnage of raw materials processed;
- the amount of resulting process wastes; and
- the volume and tonnage of any re-usable by-products.

Schematic diagrams should be provided for each distinct stage of the project (e.g. construction/site preparation, commissioning, operation and decommissioning) indicating the processes to be used and highlighting their associated waste streams (i.e. all waste outputs: solid, liquid and gaseous), including recycling efforts, such as stockpiling and reusing topsoil. The schematic diagrams, or an associated table, should cross-reference the relevant sections of the EIS where the potential impacts and mitigation measures associated with each waste stream are described. The physical and chemical characteristics of waste material from the process plant should be provided.

The proponent must demonstrate best practice waste management strategies including following conformance with the Environmental Protection (Waste) Policy: 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.

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

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

3.6.2 Air emissions

Describe in detail the quantity and quality of all air emissions (including particulates, fumes and odours) from the project during construction and operation. Particulate emissions include those that would be produced by any industrial process, or disturbed by wind action on stockpiles, or by transportation equipment (e.g. trucks, either by entrainment, loss of load or by dust from passage on unsealed roads) or from different types of motor racing vehicles.

The methods to be employed in the avoidance, mitigation and management of impacts from air emissions should be described in section 4.5.

3.6.3 Solid waste disposal

The proposed location, site suitability, dimensions and volume of any landfill, including its method of construction, should be shown.

Methods to be employed to prevent leachate from sites where solid waste has been deposited need to be identified and documented. These must include physical, impermeable barriers that are established as part of any waste disposal site.

3.6.4 Liquid waste

Describe the origin, quality and quantity of wastewater and any immiscible liquid waste originating from the project. Particular attention should be given to the capacity of wastes to generate acid, and saline or sodic wastewater. A water balance for the proposal is required to account for the estimated usage of water.

The EIS may need to consider the following effects:

- groundwater from excavations;
- rainfall directly onto disturbed surface areas;
- run-off from roads, plant and industrial areas, chemical storage areas;
- drainage (i.e. run-off plus any seepage or leakage);
- seepage from waste storages;
- water usage for:
  - process use,
  - dust suppression, and
  - domestic purposes;
- water/other liquids used for cleanups after accidents;
- cleaning of pit areas;
- oil spills and leakages on site;
- evaporation;
- domestic sewage treatment - disposal of liquid effluent and sludge; and

- water supply treatment plant - disposal of wastes.

3.7 Financial Feasibility

This part of the EIS may be confidential.

This section must detail the financial feasibility of the project, including details of costs of development and ongoing maintenance and operational costs; the capacity of the proponents to satisfactorily develop the project; fair pricing structures and cash-flow projections; estimated losses in income due to climatic conditions and both natural and human induced hazards; applicable commercial and Government fees; financial assurances and Joint Venture arrangements; and Foreign Investment Review Board issues.

The EIS should specify the sources of funding for the project, including that from private, industry and government funds.

An assessment of financial feasibility will be based on industry knowledge and experience to incorporate maintenance and long term costs and on demonstration that the staging of the development will deliver all infrastructure commitments necessary to support the accommodation, tourism and commercial elements of the development in good time. This assessment will be tailored to meet design criteria identified in the engineering component of this project.

An estimate of Financial Assurance based on assessment of the maximum cost to effect full rehabilitation/remediation of the site and any offsite disturbances using the services of third parties at any stage of construction should be provided. Include itemised costs for design, implementation, monitoring, and validation with CPI indexing over the expected construction life of the proposal plus three years.

4 Environmental, social and economic values and management of impacts

Detailed descriptions of the existing environment should be provided followed by an assessment of the potential impacts on this environment during the construction and operational phases. Information is required to show that measures have been taken to avoid and minimise potential adverse impacts of the proposal. The formulation and adoption of environmental protection measures to avoid or mitigate adverse impacts is also required. Baseline information, including from other relevant studies, should be used and referenced where appropriate.

Environmental offsets should be proposed to counterbalance any remaining loss of environmental values, consistent with the specific-issue offset policies under the framework of the *Queensland Government Environmental Offset Policy 2008*.

4.1 Climate

4.1.1 Description of existing environment

Describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect air quality within the region of the proposal. Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the proposal site. The vulnerability of the area to natural or induced hazards, such as floods and bushfires, should also be addressed. The relative frequency, magnitude and risk of these events should be considered.

4.1.2 Potential impacts and mitigation measures

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS including:

- impacts of extreme rainfall events, winds, storm surge, cyclones rising sea levels on transport infrastructure for the proposal in Section 3.5.2.1;
- impacts of extreme weather on construction and prospective events should be addressed in Sections 3.3 and 3.4.
- impacts of rainfall on soil erosion should be addressed in Section 4.2;
- 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 4.3 with regard to contamination of waterways and in Section 4.5 with regard to the design of waste containment systems; and
- impacts of winds, rain, humidity and temperature inversions on air quality should be addressed in Section 4.4.

4.1.3 Climate change adaption

Climate change, through alterations to weather patterns and rising sea level, has the potential to impact in the future on developments designed now. The EIS must provide an assessment of the project's vulnerabilities to climate change and describe adaptation strategies, based on best practice for the activity including:

- a risk assessment of how changing patterns of rainfall and hydrology, temperature, extreme weather and sea level (where appropriate) may affect the viability and environmental management of the project;

- the preferred and alternative adaptation strategies to be implemented; and
- commitments to undertaking, where practicable, a cooperative approach with government, other industry and other sectors to address adaptation to climate change.

The State government recognises that predictions of climate change and its effects have inherent uncertainties. However, the proponent must incorporate adaptation to climate change in their EIS and project design.

4.2 Land

4.2.1 Description of existing environment

This section describes existing environmental values of the land area (including seabed where applicable) that may be affected by the project. It must also define and describe the objectives and practical measures for protecting or enhancing land-based environmental values and characteristics In addition, it should describe how nominated quantitative standards and indicators may be achieved, and how they will be monitored, audited and managed.

4.2.1.1 Topography/geomorphology

Maps must be provided locating the project in both regional and local contexts. The topography of the project site must be detailed with contours at suitable increments, shown with respect to Australian Height Datum (AHD) and showing slope for all development areas on land. The topographic maps should clearly show any 5 metre AHD contour line. Significant features of the locality must be included on the maps. Such features would include any locations subsequently referred to in the EIS (e.g. the nearest noise sensitive locations and view points) that are not included on other maps in Section 3.1.

4.2.1.2 Geology

The EIS must provide a description, map and a series of cross-sections of the geology of the project area relevant to the project components. Geological properties that may influence ground stability (including seismic activity, if relevant), occupational health and safety, or the quality of wastewater leaving any area disturbed by the project must be described. In locations where the age and type of geology is such that significant fossil specimens (such as of dinosaurs or their tracks) may be uncovered during construction/operations, the EIS must address the potential for significant finds.

4.2.1.3 Soils

A soil survey of the sites affected by the project must 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 must also be provided on soil stability and suitability for construction of project facilities.

An acid sulfate soil investigation, that meets the standards set out in "*Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998*" Ahern, Ahern and Powell or any subsequent updates as they become available, must be undertaken. If an investigation based on relaxation in the sampling and analysis required under those guidelines is proposed, written agreement to any changes in the investigation standard from the Queensland Acid Sulfate Soils Investigation Team (of Department of Natural Resources and Water) must be provided. If any previous partial investigations have already been conducted then these must be provided as appendices to a document synthesising the overall results of all these investigations clearly. Any additional work required to bring investigative work up to the

standard detailed above must be performed and included in the overall investigation. The ASS Investigation must clearly define the extent of all potential and actual acid sulfate soils (if any) on the site and must adequately characterise (in the context of a preliminary approval as agreed with QASSIT) all soil horizons within the areas to be excavated and the areas that may be drained. The basis for defining the areas that may be drained must be clearly stated.

Maps which show areas and extent of good quality agricultural land as defined in the guideline "Identifying Good Quality Agricultural Land" under State Planning Policy 1/92 should be provided.

4.2.1.4 Land use

This section should describe the existing land uses, both within and impacting on and impacted by the proposal and the planning framework of the proposed works. The following issues should be addressed:

- land uses within the study area and areas potentially affected by the project;
- the regional patterns of development throughout the study area with particular regard to the SEQ Regional Plan;
- various tenures of the study area, including registered Native Title claims if any;
- the identification of each land parcel, including the segment/parcel of each affected road reserve and whether these road reserves are State Controlled Roads under the *Transport Infrastructure Act 1994* directly affected by surface works;
- planning designations within and adjacent to the study area as per Gold Coast City Council's Planning Scheme and associated local plans, policies and land use designations;
- likely future land use by reference to the SEQ Regional Plan and other local and regional planning documents, including the SEQ Regional Infrastructure Plan and Program 2007 – 2026, Integrated Regional Transport Plan for South East Queensland and Transport 2007 and the North East Gold Coast Study; and
- requirements for the project under relevant State Planning Polices (SPP).

Maps at suitable scales showing existing land uses and tenures, and the proposal location, should be provided for the entire proposal area and surrounding land that could be affected by the development. The maps should identify areas of conservation value and marine areas in any locality that may be impacted by the proposal. The location of existing dwellings, and the zoning of all affected lands according to any existing town or strategic plan should be included. Provide a land suitability map of the proposed and adjacent area, and setting out land suitability and current land uses, e.g. for growing sugar cane, grazing of native and improved pastures and horticulture. Land classified as Good Quality Agricultural Land in the Department of Natural Resources and Water land classification system is to be shown in accordance with the planning guideline, The Identification of Good Quality Agricultural Land, which supports State Planning Policy 1/92.

4.2.1.5 Landscape character

This section must describe in general terms the existing character of the landscape that will be affected by the project. It must comment on any changes that have already been made to the natural landscape since European settlement. It must 'set the scene' for the description of particular scenic values in the following section on visual amenity. The difference being that this section describes the general impression of the landscape that would be obtained while travelling through and around it, while the visual amenity section addresses particular panoramas and views (e.g. from constructed lookouts, designated scenic routes, etc.) that have amenity value.

The landscape character of the property and its surrounds must be described in the context of landscape ecology and incorporate the concepts of patch-corridor-matrix in describing the pattern of existing vegetation. In addition, the character of the landscape with respect to physical landform patterns and elements and to the characteristics of the land surface must be described using the Australian standard definitions and concepts espoused in the "*Australian Soil and Survey Field Handbook*" (McDonald *et al* 1990).

4.2.1.6 Visual amenity

This section should 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 is to 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, view sheds, existing viewing outlooks, ridgelines and other features contributing to the amenity of the area, including assessment from private residences in the affected area along the route;
- 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; and
- the value of existing vegetation as a visual screen.

4.2.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing the land-based environmental values and characteristics identified through the studies outlined in the previous section. It must describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

4.2.2.1 Land use

This section should identify and discuss potential impacts of the project (construction and operation) on existing and likely future land use including:

- on future land uses, having regard to planning instruments;

- effect of the project on broader land use and settlement patterns in the context of the SEQ Regional Plan, Gold Coast City Council's Planning Scheme and associated local plans, policies and land use designations and the outcomes of the North East Gold Coast Study ;
- effect of the project on achieving the desired intent of the SEQ Regional Plan, Gold Coast City Council's Planning Scheme, policies under the City Plan and special area designations (such as 'heritage precincts') and emerging urban renewal or future land use opportunities arising through the neighbourhood planning process.

As the proposed development potentially impacts on good quality agricultural land, then an assessment of the potential for land use conflict is required, as well as the identification of any "overriding need (for the development) in terms of benefit to the community" (from State Planning Policy 1/92). Investigations must follow the procedures set out in the planning guideline "The Identification of Good Quality Agricultural Land", which supports State Planning Policy 1/92.

The EIS should address impacts on existing residential, agricultural, commercial, open space and sensitive place activities in the study area that will or are likely to arise from the project's implementation. This assessment should include:

- consideration of necessary land acquisitions, proposed tenure (easements, leases etc.) and land use implications. Consideration of future tenure should include implications for State Land, for example Trust Land (reserves), Unallocated State Land, volumetric leases, volumetric easements, and local roads;
- any Native Title requirements necessary under the *Native Title Act 1993* (Cwth) for land acquisition, construction purposes, or other project activities and impacts;
- identification of specific land use restoration proposals, if any;
- arrangements for property access and associated street closures or widening;
- land use impacts from amenity mitigation measures such as exclusion zones and the construction of noise barriers adjacent to residential areas or other areas where sensitive places are located and the effectiveness of construction buffer zones in preventing noise impacts at sensitive places;
- impacts on surrounding land uses and human activities and strategies for the minimisation of such impacts, especially with respect to places of significant value to the community;
- potential linkages and integration with surrounding facilities and open space to service the existing local community and possible new communities;
- potential issues involved in proximity and/or co-location of other infrastructure services along the study area;
- implications of the SEQ Regional Plan designation as "Regional Landscape and Rural Production Area" in terms of transport impacts of servicing the proposed project; and
- potential impacts of changed settlement pattern (high intensity activities outside the urban footprint) on urban consolidation and transport integration.

Discussion should also include an assessment of any suggested land use and associated area designation changes that would mitigate the impacts of the project on surrounding land holdings, in particular land uses to compliment the ultimate planning for the transport corridor.

4.2.2.2 Land disturbance

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

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

Proposals for the reinstatement of the creeks must be provided if the diversion of creeks during construction or operations is expected. Where temporary dams and roads and other infrastructure are to be constructed, works programs for the management of these structures after the completion of the project must be given. A contour map of the area must be provided (if relevant). Also, the drainage and seepage control systems and any long-term monitoring plans must be described.

An ASS management plan must be prepared for any works that have the potential to disturb ASS. Management of acid sulfate soils must be based on the ASS assessment in accordance with the "*Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998*" or any subsequent updates as they become available, and management and monitoring plans prepared in consultation with officers of the Department of Natural Resources and Water and the EPA. Reference must be made to the *Soil Management Guidelines* (Dear *et al*. 2002), *Instructions for the Treatment and Management of Acid Sulfate Soils* (EPA 2001), the State Planning Policy 2/02, Planning and Managing Development involving Acid Sulfate Soils (e.g. identification and management and format of environmental management plans) and the State Coastal Management Plan 2001. Assess the likely effectiveness of the proposed mitigation measures and the likely consequences for the surrounding environment.

If geological conditions are conducive, the proponent must consider the possibility that significant fossil specimens (such as of dinosaurs or their tracks) may be uncovered during construction/operations and propose strategies for protecting the specimens and alerting the Queensland Museum to the find.

The EIS should provide details on the amount of fill which may be required, sources of supply and how it will be tested for contaminants and pests (such as fire ants).

4.2.2.3 Land contamination

A preliminary site investigation (PSI) of the site consistent with the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (available from the EPA website) must be undertaken to determine background contamination levels. The results of the PSI must be summarised in the EIS and provided in detail in an appendix.

If the results of the preliminary site investigation indicate potential or actual contamination, a site investigation, and remediation and/or validation works must be undertaken and the results submitted to the Environmental Protection Agency – Contaminated Land Unit (CLU), in accordance with the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (DEH, 1998).

In short, the following information may be required in the EIS:

- mapping of any areas listed on the Environmental Management Register or Contaminated Land Register under the EP Act;
- identification of any potentially contaminated sites not on the registers which may need

remediation; and

- a description of the nature and extent of contamination at each site and a remediation plan and validation sampling.

The EIS must address management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from Project activities. The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland can be downloaded from the EPA website at: www.epa.qld.gov.au/environment/business/contaminated).

Methods proposed for preventing, recording, containing and/or remediating any contaminated land must be outlined. Intentions must be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the land and product storage areas after Project completion.

Proponents must refer study projects to the EPA for review prior to commencement (consult with the Contaminated Land Section in the Queensland EPA).

4.2.2.4 Soil ersoion

For all permanent and temporary landforms, possible erosion rates and management techniques must be described. For each soil type identified, erosion potential (wind and water) and erosion management techniques must be outlined. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during construction, must also be outlined and acceptable mitigation strategies provided.

The report must include an assessment of likely erosion effects, especially those resulting from the removal of vegetation, and construction of retaining walls both on-site and off-site for all disturbed areas such as:

- the site, including buildings;
- access roads or other transport corridors;
- any waste dumps; and
- dams, banks and creek crossings.

Summarise methods proposed to prevent or control erosion with regard to (a) the Soil Erosion and Sediment Control - Engineering Guidelines for Queensland Construction Sites (Institute of Engineers Australia (Qld Division) 1996); (b) the EPA Guideline – EPA Best Practice Urban Stormwater Management: Erosion and Sediment Control; c) preventing soil loss in order to maintain land capability/suitability; and (d) preventing degradation of local waterways.

4.2.2.5 Landscape character

Describe the potential impacts of the project on the landscape character of the site and the surrounding area. Particular mention must be made of any changes to the broad-scale topography and vegetation character of the area and vegetation clearing.

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

4.2.2.6 Visual amenity

This section should analyse and discuss the visual impact of the proposal 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, from the air 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.

The EIS should address the potential impacts of proposed changes to the visual appearance of the area on rural amenity for the local residents and visitors to the area.

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

4.2.2.7 Lighting

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 terrestrial and marine fauna and residents;
- the potential impact of increased vehicular traffic; and
- changed habitat conditions for nocturnal terrestrial and marine fauna and associated impacts.

Provide details of expected night use of the facility, e.g. number of night activities per year, types and hours of lighting.

Provide details on the proposed energy sources for lighting and the associated greenhouse implications (address greenhouse issues in 4.4.2.2).

4.3 Water Resources

4.3.1 Description of existing environment

This section describes the existing environment for water resources that may be affected by the proposal in the context of environmental values as defined in such documents as the *Environmental Protection Act 1994*, Environmental Protection (Water) Policy 1997 (EPP(Water)), ANZECC 2000, Queensland Water Quality Guidelines 2006, and the South East Queensland Healthy Waterways Strategy 2007-2012. 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 provide sufficient information for a decision to be made on the application. Similarly, waterway barrier works may need approval under the *Fisheries Act 1994*, and if so should be addressed in the EIS.

4.3.1.1 Surface water quality

Watercourses affected by the project are to be identified with an outline of the significance of these waters to the catchment system to which they contribute. Included within this identification should be sufficient information for the proponent and DNRW to determine whether waterways are identified as *'watercourses'* under the *Water Act 2000*.

An assessment is required of existing water quality in surface waters and/or wetlands likely to be affected by the project. If appropriate, the assessment should provide the basis for a long-term monitoring program. The water quality should be described from available information, including seasonal variations or variations with flow, where applicable data are available. A relevant range of physical, chemical and biological parameters should be considered to gauge the potential for environmental harm on any affected watercourse or wetland system.

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

- values identified in the EPP (Water);
- sustainability, including ongoing maintenance of quality;
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form; and
- comparability with any Water Resource Plans, South East Queensland Healthy Waterways Strategy 2007-2012, Land and Water Management Plans and other local authority stream management initiatives relevant to the catchment, to the extent any of the above are relevant.

Where known or specified, the water quality objectives associated with environmental values for local catchments and watercourses should be described so that impacts from any proposed releases resulting from construction or operation of the project can be identified, along with measures proposed to mitigate expected impacts.

4.3.1.2 Groundwater

The EIS should review the quantity, quality and significance of groundwater in the study area and adjacent areas, together with groundwater use that may be affected by the project. The depth and extent of groundwater and flow direction should be identified where possible. All groundwater facilities and resources within the influence of the project should be identified and recorded, with details such as drilling logs, groundwater levels and yields provided.

The review of the significance of groundwater in the study area should also include an analysis of the extent of any aquifer with which the project may interfere or from which water may be removed.

The groundwater assessment should take into account the potential to intercept acid sulphate soils, and the findings of the survey for contaminated land sites within or near the study area.

The environmental values of the groundwater 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; and
- the reliability of recharge areas for the groundwater.

4.3.1.3 Flood potential

Provide details 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 proposal. Flood studies should include a range of annual exceedance probabilities for affected waterways, where data permits.

Cross-reference to 4.1 Climate.

4.3.2 Potential impacts and mitigation measures

Assess 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. Describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Water management controls should be described, addressing surface and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby marine, surface and groundwater should be discussed, along with the proposal for the diversion of affected creeks, and the stabilisation of those works. Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction and operation of the proposal.

4.3.2.1 Surface water

The EIS must address any proposed modifications or impacts to waterways both on and adjacent to the site, including infrastructure required for road crossings, drainage, pipelines and if any waterway barriers (both temporary and permanent) are required. Timeframes for any temporary waterway barriers must be nominated. This section must address the infrastructure associated with any lagoons and lakes.

The potential environmental impacts caused by changes in the flow and the quality of perennial and ephemeral waters and excavations, placement of materials or destruction of vegetation within and beside waterways or extraction of quarry material from within waterways associated with all phases of the project must be discussed. Particular reference must be given to their impacts on the current and potential downstream uses, including water and sediment input requirements of any affected waterway, riverine or lacustrine area, wetland, estuary, littoral zone, and any marine, riparian and aquatic biological uses (e.g. impact on migration and breeding patterns of native terrestrial and aquatic species). Potential impacts on the Moreton Bay Marine Park should be discussed in the EIS.

The need or otherwise for licensing and permitting of any diversions, water impoundments, extraction of quarry materials or the excavation, placement of fill or destruction of native vegetation within any watercourse, lake or spring under the *Water Act 2000* and the *Fisheries Act 1994* must be discussed. The location and extent of watercourses both longitudinal and lateral, water and quarry material allocations, water sources and the type and location of infrastructure associated with any crossings of or stormwater outlets into such features must be established in consultation with Department of Natural Resources and Water. Survey plans depicting the ground levels within waterways and lines depicting the locations of the top of the high and low banks of these features for the purposes of such permits must be provided.

The hydrological impacts of the project must be assessed, particularly with regard to stream diversions, crossings, scouring and erosion, both upstream and downstream of the project (including off-site where required for infrastructure crossings), for both permanent or temporary works. Assessment of impacts on the flow and the quality of perennial and ephemeral waters and effects on associated ecosystems must include an assessment of the likely effects on mangrove and other estuarine habitats and fish passage as a result of any temporary diversion

of existing water courses. The potential environmental impacts caused by water quality changes within near coastal freshwater environments due to any changes in the interactions between the freshwater hydrological regime and/or changes to the penetration of seawater over or through coastal dunes into brackish waterways resulting from the project must also be discussed.

Where it is proposed that creeks be diverted, the EIS must detail how rehabilitation will affect both the physical and ecological condition of the creek's bed and banks and the quality of water in it. Furthermore, the EIS must describe the monitoring that will be undertaken after construction, and who will have responsibility for management measures and corrective action, to ensure that rehabilitated creeks do not degrade.

Provide details of seawater quality monitoring at points of outflow and water quality within any near coastal lakes that have the potential to be affected by the project. Quality characteristics discussed must be those appropriate to the downstream and upstream water values that may be affected. Chemical and physical properties of any waste water (including concentrations of constituents) at the point of entering natural surface waters must be discussed along with toxicity of effluent constituents to flora and fauna.

Provide details on the proposed road network and design of bridges and culverts and their potential impacts as barriers or impediments to water flows and to wildlife movement or mitigations (either permanently or seasonally) and to any special habitat requirements of significant aquatic species, especially fish (e.g. for breeding purposes).

Having regard for the requirements of the EPP (Water), the EIS must present the methods to avoid stormwater contamination and the means of containing, recycling, reusing, treating and disposing of stormwater.

The EIS must identify any water quality changes associated with the development arising from nutrients, chemicals, or biophysical changes such as pH, turbidity, etc. The Australian and New Zealand Environment and Conservation Council (ANZECC, 2000) National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters, Queensland Water Quality Guidelines 2006 and the EPP (Water) must be used as a reference for evaluating the effects of various levels of contamination.

Options for mitigation and the effectiveness of mitigation measures must be discussed with particular reference to sediment, acidity, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

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

4.3.2.2 Groundwater

The EIS is to include an assessment of the potential for environmental impacts to be caused by the project's effect on any existing groundwater regime.

The impact assessment should consider the impacts of the project on groundwater resources; define the extent of the potential area within which groundwater resources are likely to be affected, and the significance of the project to groundwater depletion or recharge. The assessment should take into account the potential impact of the project on any affected groundwater regime including possible alteration of porosity or permeability of any land disturbed. The assessment of these potential impacts should specify any conditions for taking of groundwater. The assessment should also identify any groundwater-dependent ecosystems that may be impacted and the nature of any such impact. Proposed groundwater monitor regimes and any proposed mitigation methods, including the make-up of any reduction in supply from groundwater resources, should be described.

Potential for draw-down of known and potentially contaminated groundwater should be investigated and, if relevant, the identification of measures to manage significant contaminant migration to adjacent and previously uncontaminated sites should be carried out.

4.3.2.3 Flood management

Based on the modelling of the existing potential for flooding in the study corridor a second round of modelling should be undertaken addressing the "project in place" scenario. The risk of flooding should be assessed in design flood events to allow incorporation of this design criterion into the reference design.

The potential impacts of the proposed project on regional flood levels, appropriate locations for construction sites and workshops, transport infrastructure and effects on adjoining properties are to be assessed based on this hydraulic modelling. Where potentially significant impacts are identified their avoidance or mitigation is to be achieved through revised design or other appropriate management measure to be identified in the EIS.

Any flood mitigation structures which could potentially hold water, interfere with flow, or from which water would potentially be taken, must be identified. The potential impact of the project on flooding should be assessed to include the effect of these changes on water availability in areas licensed under the *Water Act 2000*, as well as any changes to seasonal water availability.

Cross-reference to 4.1 Climate.

4.4 Air quality and greenhouse gases

4.4.1 Description of existing environment

4.4.1.1 Air quality

This section describes the existing air environment and environmental values and characteristics that may be affected by the project.

A description of the existing air shed environment must be provided having regard for particulates and gaseous and odorous compounds and local meteorology conditions including air temperature, wind speed and direction, atmospheric stability, mixing depth and other parameters necessary for input into later studies or for the modelling of air quality within the air shed.

4.4.2 Potential impacts and mitigation measures

4.4.2.1 Air quality

Potential air quality impacts from emissions, from all events (including motor racing events), transport, potential aviation activities must be discussed with reference to the National Environmental Protection Measures (NEPM) for ambient air quality (1998), the Environmental Protection (Air) Policy 1997 and relevant Australian Standards.

The assessment of the project's impact on air quality must include a discussion of at least the following matters:

- features of the project designed to suppress or minimise emissions, including dusts and odours; and
- a potential dust and odour emissions during both construction and operation conditions.

Describe the objectives and practical measures for protecting or enhancing environmental values and characteristics for air. Describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

The objectives for air emissions must be stated in respect of relevant standards (ambient and ground level concentrations), relevant guidelines, and any relevant legislation.

4.4.2.2 Greehouse gas emissions and abatement

The EIS must:

- provide a discussion of potential emissions during construction for each relevant greenhouse gas from construction equipment and plant, delivery of construction equipment, worker transport-related activities, with total emissions expressed in 'CO2 equivalent' terms;
- provide a discussion of expected operational emission sources (including motor racing activities, aviation and related activities, transport to events, transport of goods and services to the site and waste etc from the site) and emissions expressed in 'CO2 equivalent' terms;
- estimate emissions from upstream activities associated with the construction of the proposed project (including fossil fuel based electricity consumed) and the operational life of the project; and
- briefly describe method(s) by which estimates were made.

The emissions may be estimated using the methodology contained in the National Greenhouse Accounts (NGA) Factors, Department of Climate Change (January 2008), or the most recent version.

The EIS must also propose and assess greenhouse gas abatement measures. The EIS must include:

- a description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from construction activities of the project;
- an assessment of how the preferred measures minimise emissions and achieve energy efficiency;
- an indication of how the preferred measures for emission controls and energy consumption compare with practice in the relevant sector of industry with a view to achieving best practice environmental management;
- a description of any opportunities for further offsetting greenhouse gas emissions (including motor racing and other operational gas emissions) through indirect means; and
- an assessment of the implications of transport-related emissions trading (including stationary power for electrified transport in relation to the proposed light rail link).

Direct means of reducing greenhouse gas emissions could include such measures as minimising clearing at the site (which also has imperatives besides reducing greenhouse gas emissions).

Whilst recognising that the EIS process will identify environmental aspects and appropriate mitigation options, the environmental management plan in the EIS should include a specific module to address greenhouse abatement. That module should include:

- 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;
- commitment to energy efficiency opportunity assessment and technology review, including undertaking periodic energy assessments with a view to progressively improving energy efficiency;
- voluntary initiatives such as the national Greenhouse Challenge Plus program; and
- commitments to monitor, assess and report on greenhouse emissions from relevant activities and the success of mitigation measures in accordance with the *National Greenhouse and Reporting Act*.

4.5 Waste

This section must complement other sections of part 4 of the EIS by providing technical details of waste treatment and minimisation, with proposed emission, discharge and disposal criteria, while other sections describe how those emissions, discharges and disposals would impact the relevant environmental values and characteristics. The purpose of this format is to concentrate the technical information on waste management into one section in order to facilitate its transfer into the EM Plan.

4.5.1 Description of existing environment

This section describes the existing environment values that may be affected by the project's wastes. Refer to each of the waste streams described in section 3.6 and provide references to environmental values and characteristics described in other sections of part 4 of the EIS.

4.5.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values and characteristics from impacts by wastes, describes how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives will be monitored, audited and managed.

Assess the potential impact of all wastes to be generated 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 and characteristics;
- proposed discharge/disposal criteria for liquid and solid wastes;
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or dredge spoil must be given;
- expected frequency and nature of discharges into waterways from emergency sewerage outfalls or the failure of sewerage infrastructure particularly at crossings of waterways and major drainage paths;
- market demand for recyclable waste (where appropriate) must be addressed; and

- waste minimisation techniques/processes proposed.

Having regard for the Environmental Protection (Waste) Policy, the EIS must indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during all phases of the project. The EPA draft guidelines covering aspects of waste management under this EPP must also be addressed.

Waste minimisation and treatment, and the application of cleaner production techniques, must also be applied to gaseous wastes, particularly particulates and carbon dioxide. Particular attention must be paid to measures that will maximise energy efficiency and minimise internal energy consumption in the project.

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

4.6 Noise and vibration

4.6.1 Description of existing environment

This section describes the existing environment values that may be affected by noise and vibration from the project.

The locations of sensitive sites must be identified on a map at a suitable scale. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997.

Comment must 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).

If the proposed activity could adversely impact on the noise environment, the daily variation of background noise levels at nearby sensitive sites must be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the night. Monitoring methods must adhere to accepted best practice methodologies, relevant Environmental Protection Agency guidelines and Australian Standards, and any relevant requirements of the Environmental Protection (Noise) Policy 1997. Baseline monitoring should also be described with reference to AS1055– Description and Measurement of Environmental Noise (1997).

4.6.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values and characteristics from impacts by noise and vibration, describes how nominated quantitative standards and indicators may be achieved for noise and vibration management, and how the achievement of the objectives will be monitored, audited and managed. The assessment of noise impacts must (where relevant) 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 likely noise impacts upon existing residents from both construction and operation of the project must be detailed. Details should include of the types of events (motor racing, concerts etc) proposed to be staged at the site, expected noise levels of these events, timing of events should be provided. The EIS must provide details of how noise levels will be monitored (in accordance with EPA) and addressed if unacceptable noise levels are reached.

The potential environmental impact of noise and vibration at all potentially sensitive places, in particular, any place of work or residence must be assessed in terms of noise objectives and standards to be achieved. Particular consideration must be given to emissions of low-frequency noise; that is, noise with components below 200Hz and noise emissions from special events such as motor races. The assessment must also include environmental impacts on terrestrial and marine animals and avifauna, particularly migratory species. Proposed strategies and measures for the minimisation or elimination of impacts must be provided, including details and illustrations of any screening, lining, enclosing or bunding.

Information must 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 general amenity and fauna, particularly migratory marine fauna. The magnitude, duration and frequency of any vibration must be discussed. A discussion must be provided of measures to prevent or minimise environmental nuisance and harm. Blasting noise and vibration limits are provided in section 61 of the Environmental Protection Regulation 1998. Reference must also be made to the Queensland EPA Guideline: "*Noise and vibration from blasting*".

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

4.7 Nature conservation

4.7.1 Description of existing environment

This section describes the existing environment values for nature conservation that may be affected by the proposal.

Describe the environmental values of nature conservation for the affected area in terms of:

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

A discussion should be presented on the nature conservation values of the areas likely to be affected by the proposal. The flora and fauna communities which are rare or threatened, environmentally sensitive localities including the marine environment, waterways, riparian zone,

and littoral zone, rainforest remnants, old growth indigenous forests, wilderness and habitat corridors should be described. The description should include a plant species list, a vegetation map at appropriate scale and an assessment of the significance of native vegetation, from a local and regional and state perspective. The description should indicate any areas of state or regional significance identified in an approved biodiversity planning assessment (BPA) produced by the EPA (e.g. see the draft Regional Nature Conservation Strategy for SE Qld 2001-2006).

The EIS should identify areas where connectivity of remnant vegetation (of the same pre-clearing RE type) is protected and enhanced. This should include the rehabilitation of degraded habitats that occur on the site.

The EIS should identify issues relevant to sensitive areas, or areas, which may have, low resilience to environmental change. Areas of special sensitivity include the marine environment and wetlands, wildlife breeding or roosting areas, any significant habitat or relevant bird flight paths for migratory species, bat roosting and breeding caves including existing structures such as adits and shafts, and habitat of threatened plants, animals and communities. The capacity of the environment to assimilate discharges/emissions should be assessed. Proposal proximity to any biologically sensitive areas should be described.

Areas regarded as sensitive with respect to flora and fauna have one or more of the following features (and which should be identified, mapped, avoided or effects minimised):

- important habitats of species listed under the *Nature Conservation Act 1992* as presumed extinct, endangered, vulnerable or rare;
- regional ecosystems listed as 'endangered' or 'of concern' under State legislation;
- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas;
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species;
- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA);
- sites adjacent to nesting beaches, feeding, resting or calving areas of species of special interest; for example, marine turtles and cetaceans;
- sites containing common species which represent a distributional limit and are of scientific value or which contains feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance;
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
  - natural vegetation in good condition or other habitat in good condition (e.g. wetlands); and/or
  - degraded vegetation or other habitats that still supports high levels of biodiversity or acts as an important corridor for maintaining high levels of biodiversity in the area;
- a site containing other special ecological values, for example, high habitat diversity and areas of high endemism;
- ecosystems which provide important ecological functions such as: wetlands of national, state and regional significance; coral reefs; riparian vegetation; important buffer to a protected area or important habitat corridor between areas;
- sites of palaeontologic significance such as fossil sites;
- sites of geomorphological significance, such as lava tubes or karst;

- protected areas which have been proclaimed under the NC Act and *Marine Parks Act 1982* or are under consideration for proclamation; and/ or
- areas of major interest, or critical habitat declared under the NC Act or high nature conservation value areas or areas vulnerable to land degradation under the *Vegetation Management Act 1999* (VM Act); and
- Reference should be made to both State endangered species legislation.

The Queensland VM Act and the findings of any regional vegetation management plan should also be referenced.

The occurrence of pest plants and animals in the project area should be described.

Key flora and fauna indicators should be identified for future ongoing monitoring. Surveys of flora and fauna need to be conducted throughout the year to reflect seasonal variation in communities and to identify migratory species.

The EPA's guidelines for "Fauna and Flora Assessment in EIA" provide further details. The EPA should be consulted on the scope of any biological studies before they are undertaken.

4.7.1.1 Terrestrial flora

For terrestrial vegetation a map at a suitable scale should be provided, with descriptions of the units mapped. Sensitive or important vegetation types should be highlighted, 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. The existence of rare or threatened species should be specifically addressed. The surveys should include species structure, assemblage, diversity and abundance. 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 location of any horticultural crops in the vicinity of the site should be shown. The existence of important local and regional weed species should also be discussed.

Vegetation mapping should provide vegetation mapping for all relevant project sites including new transport infrastructure, port facilities and irrigation land if relevant. Adjacent areas may also require mapping.

The terrestrial vegetation communities within the affected areas should be described at an appropriate scale (maximum 1:10,000) with mapping produced from aerial photographs and ground truthing, showing the following:

- location and extent of vegetation types using the EPA's regional ecosystem type descriptions in accordance with the Regional Ecosystem Description Database [REDD] available at the EPA's website;
- location of vegetation types of conservation significance based on EPA's regional ecosystem types and occurrence of species listed as protected plants under the Nature Conservation (Wildlife) Regulation 1994 and subsequent amendments, as well as areas subject to the VM Act;
- areas and extent of remnant vegetation as defined by the VM Act;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges);
- any plant communities of cultural, commercial or recreational significance should be identified; and
- location and abundance of any exotic or weed species.

Within each defined (standard system) vegetation community, a minimum of three sites (numbers should be discussed with the EPA) should be surveyed for plant species, preferably in both summer and winter, as follows:

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

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

4.7.1.2 Terrestrial fauna

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

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that are poorly known but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement;
- the existence of feral or exotic animals;
- existence of any 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); and
- use of the area by migratory birds, nomadic birds, fish and terrestrial fauna.

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

4.7.1.3 Aquatic biology

If no biota surveys/studies have previously been conducted in and downstream of the project area, the aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways and/or associated lacustrine and marine environments. The description of the fauna and flora present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area, and/or those in any associated lacustrine and marine environment;
- any rare or threatened marine species, particularly the dugong and its habitat;
- aquatic plants;
- aquatic and benthic substrate; and
- habitat downstream of the project or potentially impacted due to currents in associated lacustrine and marine environments.

4.7.2 Potential impacts and mitigation measures

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

The EIS should address any actions of the project or likely impacts that require an authority under the NC Act, and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*.

The discussion should cover all likely direct and indirect environmental harm due to the project on flora and fauna particularly sensitive areas as listed below. Terrestrial and aquatic (marine and freshwater) environments should also be covered, if applicable. Also include human impacts and the control of any domestic animals introduced to the area.

Strategies for protecting any rare or threatened species should be described, and any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations (i.e. JAMBA, CAMBA) should be discussed. Emphasis should be given to potential environmental harm to benthic and intertidal communities, seagrass beds and mangroves.

Strategies for collecting and preserving any significant fossils should be described.

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

Information is required to show that measures have been taken to avoid and minimise potential adverse impacts of the proposal on nature conservation and biodiversity values. Any remaining loss of environmental values should be identified. Environmental offsets should be described that counterbalance the remaining loss of environmental values.

Proposed environmental offsets should be consistent with the requirements are set out in specific-issue offset policies under the framework of the Queensland Government Environmental Offset Policy 2008. Relevant specific-issue policies that should be addressed are:

- Vegetation management - Policy for Vegetation Management Offsets, September 2007, Department of Natural Resources and Water;
- Marine fish habitat - Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss, 2002, Department of Primary Industries and Fisheries;
- Koala habitat - Offsets for Net Benefit to Koalas and Koala Habitat, 2006, Environmental Protection Agency; and

And any subsequent specific-issue policies prepared under the Queensland Government Environmental Offset Policy 2008 framework.

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

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

Weed management strategies are required for containing existing weed species (e.g. parthenium and other declared plants) and ensuring no new declared plants are introduced to the area. Feral animal management strategies and practices should also be addressed. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a feral animal species. Reference should be made to the local government authorities pest management plan when determining control strategies. The strategies for both flora and fauna should be discussed in the main body of the EIS and provided in a working form in a Pest Management Plan as part of the overall EM plan for the project.

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

4.8 Cultural heritage

4.8.1 Description of existing cultural heritage values

This section describes the existing cultural heritage values that may be affected by the project. Describe the environmental values and characteristics of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.

A cultural heritage study (including archaeological surveys) may be required that will describe indigenous and non-indigenous cultural heritage sites and places, and their values.

4.8.1.1 Indigenous cultural heritage

An Indigenous cultural heritage study is a specific process under the *Aboriginal Cultural Heritage Act 2003* (ACHA) the sole purpose of which is to have an area/object recognised and recorded on the Aboriginal Cultural Heritage Register. A requirement of the Act is that a Cultural Heritage Management Plan (CHMP) is an essential element of any EIS. All work must be conducted by a suitably qualified expert that is agreed upon between the parties and must include the following:

- notification, as required by the ACHA, to the Chief Executive of DNRW, Gold Coast City Council (only if owner or occupier of the subject land), and the registered Native Title Claimants, who are the Aboriginal Parties under the ACHA;
- endorsement of those Aboriginal Parties who respond to the notification;
- consultation with the Aboriginal Parties about their involvement in the development of the CHMP, and about outcomes;
- compliance with the Duty of Care Guidelines and the CHMP Guidelines as gazetted;
- seeking approval of the CHMP from the Chief Executive, DNRW, through the EIS process;
- liaison with the Aboriginal Parties concerning:
  - places of significance to that community (including archaeological sites, natural sites, story sites etc;
  - appropriate community involvement in field surveys;
- any requirements by communities and /or informants relating to confidentiality of site data must be highlighted. Non-Indigenous communities may also have relevant information;
- a search of both the Cultural Heritage register and the Cultural Heritage database;
- a systematic survey of the proposed development area to locate and record Indigenous cultural heritage places;
- significant assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values; and
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations.

4.8.1.2 Non-indigenous cultural heritage

The cultural heritage study must be conducted by a suitably qualified expert and will require:

- a permit to conduct the research and survey will be required under the provisions of the Queensland *Heritage Act 1992*. The EPA regional manager must be consulted for the provision of general advice including the appropriate conduct of cultural heritage surveys and the necessary permit;
- a systematic survey of the proposed development area to locate and record non-Indigenous cultural heritage places;
- significance assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values;
- consultation regarding non-indigenous cultural heritage values within the study area with relevant community groups (e.g. historical society, museum organisation, and conservation groups); and

- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations.

4.8.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing cultural heritage environmental values and characteristics, describes how nominated quantitative standards and indicators may be achieved for cultural heritage management, and how the achievement of the objectives will be monitored, audited and managed.

The environmental impacts to cultural heritage values in the vicinity of the project must be managed under a CHMP developed specifically for the project. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the project sites. It is usual practice for the CHMP to be based on information contained in archaeological and/or anthropological reports on the survey area and cultural reports and/or information from affiliated traditional owners. The CHMP must address and include the following:

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

The development of the CHMP must be negotiated between the relevant parties i.e. the project proponent and the relevant Aboriginal party.

Any collection of artefact material as part of a mitigation strategy will need to be done by a suitably qualified expert as agreed between the relevant parties.

Provide a cultural heritage management plan for non-indigenous cultural heritage values if significant values are identified.

4.9 Social environment

4.9.1 Description of existing social values

Describe the social values for the affected area in terms of the integrity of social conditions, including amenity and liveability, harmony and well-being, sense of community, access to recreation, and access to social and community services and infrastructure.

The social amenity and use of the project area and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential purposes must be described. Provide details on:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community;
- local community values, vitality and lifestyles;
- recreational, commercial, tourism, indigenous, cultural, leisure and sporting facilities and activities in relation to the affected area;
- health and educational facilities;
- current property values;
- number of properties directly affected by the project; and
- number of families affected by the project, this must include not only property owners but also families of workers either living adjacent the site or workers where the area is their primary employment.

This section should describe employment in local industries such as the sugar industry, including businesses involved in providing inputs and downstream processing of sugar, mulch and ethanol; and the social impacts of possible closure of the mill due to the potential loss of land currently in the production area due to the proposal.

Social, economic and cultural values are not as easily separated as physical and ecological values. Therefore, it may be necessary for some material in this section to be cross-referenced with in section 3.4 Construction, 3.6.2 Infrastructure (Transport), 4.2 Land (Visual amenity), 4.6 Noise and vibration, 4.8 Cultural Heritage, 4.10 Public health and safety, and Section 4.12 Economic environment.

4.9.2 Potential impacts and mitigation measures

This section is to define and describe the objectives and practical measures for protecting or enhancing social values, describes 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 social impact assessment of the project must consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the project's impact, both beneficial and adverse, on the local community. The impacts of the project on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages of the development. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The social impact assessment must include sufficient data to enable State authorities, such as Queensland Health, Department of Communities and Education Queensland, to plan for the continuing provision of public services in the region of the project. Proponents of projects that are likely to result in a significant increase in population of an area must consult the relevant management units of the State authorities and summarise the results of the consultations in the EIS. The summary must discuss how the impacts of population increase on public services, particularly health, emergency services and education, would be mitigated.

The social impact assessment of the project is to be carried out in consultation with the Department of Communities. The assessment of impacts must describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts must be considered both at the regional and local level.

The EIS must address the following matters:

- an assessment of impacts (including noise; increased traffic and loss of open buffer space) on local residents, businesses, educational facilities; current land uses and existing lifestyles and enterprises and how these impacts will be mitigated;
- a baseline analysis of the existing housing market with emphasis on:
  - the size of the private rental market in the area (including boarding houses, caravan parks, backpacker hostels, hotel and motel accommodation);
  - vacancy rate of rental accommodation (including assessment of seasonal fluctuations, median rents for the area;
  - the availability and median cost of housing for purchase in the area; and
  - the level of social housing in the area (including rental housing administered by community housing organisations and public housing, and constraints and opportunities for new housing construction in the area including the capacity of the local land development and housing construction industries to provide new housing). (The Department of Housing can supply relevant information on the housing market.);
- employment opportunities which may be created and lost through the development.
- impacts of both construction and operational workforces and associated contractors on housing demand, community services and community cohesion is to be addressed. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed. Impacts on the housing sector must include;
  - impacts on housing prices and rent as well as any deterioration in housing affordability by low-income groups including temporary workers;
  - cumulative impacts on the local and regional housing market due to the presence of other existing or proposed major projects in the area, as well as cumulative impacts due to seasonal employment factors; and
  - impact of the construction phase of the project on the local and regional residential development and housing construction industry;
- existing housing market, particularly rental accommodation which may be available for the project workforce;
- development of an accommodation management strategy, where necessary, in consultation with the Department of Housing;
- comment on how much service revenue and work from the project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the project;
- an assessment of impacts on local and state labour markets, with regard to the source of the workforce. This information is to be presented according to occupational groupings of the workforce. In relation to the source of the workforce, information is required as to whether the proponent, and/or its contractors, is likely to employ locally or through other means and whether there are initiatives for local employment opportunities;

- impacts of both construction and operational workforces and associated contractors on housing demand, community services and community cohesion. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed;
- identify and take account of relevant demographic, social, cultural and economic profiles;
- identify any new skills and training to be introduced in relation to the project. Adequate provision must be made for apprenticeship and worker training schemes. If possible, the occupational skill groups required and potential skill shortages anticipated must be indicated;
- provide comment on how much service revenue and work from the project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the project;
- potential changes in the valuation of surrounding properties;
- impacts on existing local residents' values and aspirations;
- proposed level of access by local groups to the community facility primarily from a scheduling and affordability perspective. Level of community engagement on this issue and agreed outcomes should also be addressed; and
- in regard to affected Indigenous and non-Indigenous communities respectively, particular attention must be paid to the effects on:
  - the ability of both indigenous and non-indigenous people, to live in accordance with their own values and priorities;
  - the use of and access to culturally important areas and landscapes;
  - the access to existing human and commercial services and housing;
  - the ability to participate in regional and local employment and training opportunities; and
  - the new project workforce and their families.

For the construction and operational phases of the development, describe the effects of the project on local and regional residents, including land acquisition and relocation issues and property valuation and marketability, community services and recreational activities.

Discuss the potential environmental impacts on the amenity of adjacent areas used for cropping, grazing, forestry, recreation, industry, education, aesthetics, and scientific or residential purposes. Describe the implications of the project for future developments in the local area including constraints on surrounding land uses.

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

- primary, secondary and tertiary educational sectors;
- improved appreciation of conservation areas; and
- environmental education for the general public.

For identified impacts to social values, suggest mitigation and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes must also be recommended.

4.10 Public health and safety

4.10.1 Description of existing public health and safety community values

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

Consideration must also be given to health and safety aspects of erosion control structures and water storages or other structures that may impact on public health and safety especially for children in and near waterways and drainage infrastructure.

4.10.2 Potential impacts and mitigation measures

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

The EIS must 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 (in particular motor vehicle emissions). Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders must be detailed in terms of health, safety, quality of life from factors such as air emissions, odour, dust and noise.

Map(s) must 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 should discuss impacts of any potential nuisance and criminal activity on local residents which may occur as a result the proposal. Strategies for managing these potential issues should also be addressed in the EIS.

The EIS must address the project's potential for providing disease vectors. Measures to control mosquito and biting midge breeding must be described (including the potential impacts to the receiving environment). Any use of recycled water must 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 must 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 must also be recommended in this section.

Any health or safety issues associated with the feral pigs that frequent the site must be assessed, e.g. attacks, disease.

Practical monitoring regimes must also be recommended in this section.

4.11 Hazard and risk

4.11.1 Description of existing environment

This section describes the potential hazards and risk that may be associated with the project. The level of detail in this section should be appropriate to the level of approval being sought.

Detail the environmental values and characteristics likely to be affected by any hazardous materials and actions incorporated in the project. The degree and sensitivity of risk must be detailed.

An analysis is to be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the project on sensitive areas and resources such as forests, water reserves, State and local Government controlled roads, places of residence and work, and recreational areas.

Additional issues to be discussed include:

- security issues (during construction and once operational);
- identification of types of dangerous goods to be used both during the construction and during operational stages including any additional onsite refuelling storage, procedures to minimise adverse environmental impacts;
- an assessment of fire risks, including bushfire risk, and discuss fire control and management proposals along with details of fire safety measures for treatment of hazardous material spills;
- development and implementation of emergency plans, procedures and notifications and the identification and provision of emergency services and resources both on and off-site;
- information on access points to the airstrip for accidents and/or Medivac retrievals during the construction and operational stage, including alternative access in the event of gridlock during construction;
- a description of relationships with disaster control organisations including command and control; and
- measures to reduce the risk of hazardous incidents affecting the public and environment.

4.11.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting people and places from hazards and risk, describes how nominated quantitative standards and indicators may be achieved for hazard and risk management, and how the achievement of the objectives will be monitored, audited and managed.

The EIS must provide a discussion of the classes of substances listed in the Australian Dangerous Goods Codes that are expected to be held on-site. Details must be provided, to the greatest extent possible, of:

- safeguards proposed on the transport, storage, use, handling and on-site movement of the materials to be stored on-site;
- the capacity and standard of bunds to be provided around the storage tanks for classified dangerous goods and other goods likely to adversely impact upon the environment in the event of an accident; and
- the procedures to prevent spillages, and the emergency plans to manage hazardous situations.

The proponent must develop an integrated risk management plan for the whole of the life of the project including construction and operation phases. The plan must include a preliminary hazard analysis (PHA), conducted in accordance with appropriate guidelines for hazard analysis (e.g. HAZOP Guidelines, NSW Department of Urban Affairs and Planning (DUAP)). The assessment must outline the implications for and the impact on the surrounding land uses, and must involve consultation with Department of Emergency Services, Queensland Fire and Rescue Authority, and Queensland Ambulance Service. The preliminary hazard analysis must incorporate, where appropriate:

- all relevant majors hazards both technological and natural;
- the possible frequency of potential hazards, accidents, spillages and abnormal events occurring;
- indication of cumulative risk levels to surrounding land uses;
- life of any identified hazards;
- a list of all hazardous substances to be used, stored, processed, produced or transported;
- the rate of usage;
- description of processes, type of the machinery and equipment used;
- potential wildlife hazards such as crocodiles, snakes, and disease vectors;
- public liability of the State for private infrastructure and visitors on public land; and
- potential hazards and risks associated with transport of public internal and external to the site.

The plan must include the following components:

- operational hazard analysis;
- regular hazard audits;
- fire safety, emergency response plans;
- qualitative risk assessment; and
- construction safety.

Where relevant, each of these components must be prepared in accordance with the relevant NSW DUAP Hazardous Industry Planning Advisory Paper (HIPAP).

Describe the possible risks of a single access road (entrance and exit) for the proposed development, e.g. access by emergency vehicles if the road is blocked as a result of a natural disaster.

Report on consultation with Emergency Management Queensland (EMQ) regarding the proposed utilisation of the onsite airstrip for helicopter evacuation in relation to emergency response issues.

State Planning Policy 1/03 - Mitigating the adverse impacts of flood, bushfire and landslide must be addressed.

4.11.3 Emergency management plan

Preliminary information on the design and operation of proposed safety/ contingency systems to address terrorist attack, fire prevention/protection, leak detection/ minimisation, release of contaminants should be presented for the whole project. In addition, an assessment of businesses and residences that may be affected in the event of an emergency should be undertaken, including strategies to mitigate the impact on these businesses.

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

An outline of the proposed emergency management procedures is to be provided (including evacuation plans) for the range of situations identified in the above risk assessment as providing measurable risks, including strategies to deal with contingencies such as hydrocarbon/ oil spills and natural disasters during operations.

In regard to fires, the EIS should address:

- fire management systems to ensure the retention on site of fire water or other fire suppressants used to combat emergency incidents;
- building fire safety measures for any construction or permanent accommodation;
- details of any emergency response plans and bushfire mitigation plans under the SPP 1/03;
- on-site fire fighting equipment provided and the level of training of staff who will be tasked with emergency management activities;
- detailed maps showing the plant outline, potential hazardous material stores, incident control points, fire fighting equipment, etc.; and
- an outline of any dangerous goods stores associated with the plant operations, including fuel storage and emergency response plans.

The EIS should present outlines of emergency planning and response strategies to deal with relevant incidents above, which have been determined in consultation with State and regional emergency service providers.

The EIS should present plans for involvement of the relevant State agencies (such as the Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland) in relation to emergency medical response and transport and first aid matters.

4.12 Economic environment

4.12.1 Description of existing economic character

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

- the sugar industry, including sugar, ethanol and mulch production and electricity co-generation; and
- economic performance (including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular commodity prices for sugar and ethanol).

The economic impact statement must include estimates of the opportunity cost of the project

and the value of ecosystem services provided by natural or modified ecosystems to be disturbed or removed during development.

4.12.2 Potential impacts and mitigation measures

The function of this section is to define and describe the objectives and practical measures for protecting or enhancing economic values and to describe how nominated quantitative standards and indicators may be achieved for economic management, and how the achievement of the objectives will be monitored, audited and managed.

The effect on local and State labour markets must be discussed with regard to the source of the workforce. This information must be presented according to occupational groupings of the workforce. In relation to the source of the workforce, clarification is required as to whether the proponent, or contractors, are likely to employ locally or through other means and whether there are initiatives for local employment opportunities. The impacts of both construction and operational workforces and associated contractors on housing demand must be addressed. The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the project must be discussed.

Any new skills and training to be introduced in relation to the project must be identified. Adequate provision must be made for apprenticeship and worker training schemes. If possible, the occupational skill groups required and potential skill shortages anticipated must be indicated.

An economic analysis, including a cost-benefit analysis, must be presented from national, state, regional and local perspectives as appropriate to the scale of the project. The general economic benefits from the project must be described.

At a level of detail appropriate to the scale of the project, the analysis is to consider:

- the significance of this project on the local and regional economic context;
- the long and short-term beneficial (e.g. job creation) and adverse (e.g. loss of production impact on the sugar mill, distillery and mulching operation and the local farmers) impacts that are likely to result from the development;
- the potential, if any, for direct equity investment in the project by local businesses or communities;
- the cost to all levels of government of any additional infrastructure provision;
- implications for future development in the locality (including constraints on surrounding land uses and existing industry);
- the potential economic impact of any major hazard identified in section 4.11 (Hazard and risk);
- the distributional effects of the project including proposals to mitigate any negative impact on disadvantaged groups;
- the value of lost opportunities or gained opportunities for other economic activities anticipated in the future;
- impacts on local property values;
- potential impact on other local industries (e.g. local driver training facility);
- the economic benefit provided to the tourism industry and potential economic benefits which may flow to general business and industry in the local area;
- potential impact of the project on the South East Queensland motor sport industry (including facilities, racing teams and supporting services);

- potential for the proposed technology precinct and training facilities to offer complementary facilities to support other industry sectors (e.g. engine maintenance for the aviation industry);
- restrictions in motorsports activities due to greenhouse implications and the potential shortage of oil.

Consideration of the impacts of the project in relation to energy self-sufficiency, security of supply and balance of payments benefits may be discussed. Attention must be directed to the long and short-term effects of the project on the land-use of the surrounding area and existing industries, regional income and employment and the state economy. The scope of any studies must be referred to the relevant State government agencies for input before undertaking the studies.

Potential impacts and mitigation measures should include measures for protecting or enhancing the economic values of existing industries likely to be impacted or displaced by the proposal (e.g. the sugar industry).

For identified negative impacts to economic values, suggest mitigatory and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes must also be recommended.

4.13 Cumulative impacts

The purpose of this section is to provide a clear and concise summary of the cumulative impacts (i.e. the additional impacts on population, workforce, accommodation, housing, use of community infrastructure and services) detailed in prior sections, and to provide a description of these cumulative impacts both in isolation and in combination with other known, existing or proposed project(s), to the greatest extent practicable.

The methodology which has been used to determine the cumulative impacts of the project should also be presented, detailing the range of variables considered, including where applicable, relevant baseline or other criteria upon which the incremental aspects of the project have been assessed.

5 Environmental Management Plan

The environmental management plan (EM Plan) must be developed from the mitigation measures detailed in part 4 of the EIS. Its purpose is to set out the proponent's commitments to environmental management. That is, how environmental values and characteristics will be protected and enhanced. Separate EM Plans must address discrete project elements and must provide life-of-proposal control strategies in accordance with agreed performance criteria for specified acceptable levels of environmental impacts.

Although the EM Plan is an integral part of the EIS and must be capable of being read as a stand-alone document without reference to other parts of the EIS, the EM Plan must not raise any issues or proposed mitigation measures not already addressed in the body of the EIS.

The aims of an EM Plan are to provide:

- commitment by the proponent to achieve best practice environmental management;
- 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 as a minimum standard;
- an integrated plan for comprehensive monitoring and control of impacts;
- local and State authorities, stakeholders and the proponent with a common focus for approvals conditions and compliance with policies and conditions; and
- the community with evidence that the environmental management of the project is acceptable.

EM Plans must commit to protect, enhance and manage identified environmental values and characteristics. The commitments must contain the following components for performance criteria and implementation strategies:

- environmental protection objectives for enhancing or protecting each relevant value;
- indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved;
- environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective; and
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
  - continuous improvement;
  - environmental auditing;
  - monitoring;
  - reporting;
  - staff training; and
  - a rehabilitation program for land proposed to be disturbed under each relevant aspect of the proposal.

It is expected that all EM Plans will be prepared in accordance with the EPA Guideline "Site-based management plans" and its recommended structure for EM Plans. The general contents of the EM Plan must comprise:

- the proponent's commitments to acceptable levels of environmental performance, including environmental objectives, i.e. levels of expected environmental impacts, performance standards and associated measurable indicators, performance monitoring and reporting;
- impact prevention or mitigation actions to implement the commitments; and
- corrective actions to rectify any deviation from performance standards.

Through the EM Plan, the EIS's commitments to environmental performance can be used as regulatory controls through conditions to comply with those commitments. Therefore, the EM Plan is a relevant document for project approvals, environmental authorities and permits, and may be referenced by them.

Arrangements must be in place to support the "best practice environmental management and design" components of the project so that there are no impacts on environmental protection measures should the property market fail to meet expectations.

6 Proponent's environmental record

Pursuant to the State Development and Public Works Organisation Regulation 1999, i-METT Queensland Group Pty Ltd needs to provide details of any Australian proceedings relating to an environmental law against it, its parent company or members of the Board of Directors. i-METT Queensland Group Pty Ltd must supply information regarding any applicants for permits under an environmental law for the project. Furthermore, details of i-METT Queensland Group Pty Ltd's environmental policy and planning framework must be incorporated into the EIS.

7 Conclusion and recommendations

The EIS must make conclusions and recommendations with respect to the proposal, based on the studies presented, the environmental management plans and conformity of the proposal with legislative and policy requirements.

8 References

References should be presented in a consistent and recognised format.

9 Recommended appendices

9.1 Terms of reference for this EIS

A copy of the final ToR must be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the ToR at least must be bound with the main body of the EIS for ease of cross-referencing. A summary, cross-referencing specific items of the ToR to the relevant section of the EIS, must also be provided in Section 4.13 of the EIS. For this purpose the ToR must be line numbered.

9.2 Cross-reference with the terms of reference

This section provides a cross reference of the findings of the relevant sections of the EIS, where the potential impacts and mitigation measures associated with the project are described, with the corresponding sections of the ToR.

9.3 Development approvals

A list of all the approvals (including local law approvals) required by all phases of the project must be presented (in the expected sequencing of applications) along with their corresponding regulating legislation and the approving authority.

9.4 Study team

The qualifications and experience of the study team and specialist sub-consultants and expert reviewers must be provided.

9.5 Consultation report

The summary Consultation Report appendix for an EIS must commence by including the details of affected and interested persons (as described by the EP Act), and the statement of planned consultation with those persons. It must describe how 'interested' and 'affected persons,' and any 'affected parties' were identified.

A further list must be provided that includes the state and local government agencies consulted, and the individuals and groups of stakeholders consulted.

The Consultation Report appendix must summarise the methods and 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 must include the methodology used in the community consultation program including criteria for identifying stakeholders and the communication methods used and when the consultation was undertaken.

The Department of Communities is able to provide advice on community engagement principles, frameworks and processes. There are a number of Departmental publications which can be used to inform the development and implementation of appropriate methodologies in any community engagement process. Community engagement guides and resources can be found on the department of Communities website: *www.communities.qld.gov.au* or *www.getinvolved.qld.gov.au*. Officers at the Department of Communities, Far North Queensland Region, are able to provide advice regarding appropriate community engagement strategies.

9.6 Research

Any proposals for researching alternative environmental management strategies or for obtaining any further necessary information must be outlined in an appendix.

9.7 Specialist studies

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

9.8 List of proponent commitments

A list of all commitments made by the proponent in the EIS (in addition to the performance criteria stipulated in the EM Plan) must be provided along with a reference to the relevant section in the EIS.