SHUTE HARBOUR MARINA PROJECT

Shute Harbour Marina Development Pty Ltd

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, May 2007

Terms of Reference

PREFACE

The Shute Harbour Marina project (the Proposal) was declared a "significant project" under Section 26(1)(a) of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) by the Coordinator-General (CG) on 24 July 2006. Matters considered by the CG in making this declaration included information in an Initial Advice Statement prepared by the proponent; relevant planning schemes and policy frameworks; infrastructure impacts; employment opportunities; environmental effects; complexity of local, State and Commonwealth requirements; level of investment; and the Proposal's strategic significance. The declaration initiates the statutory environmental impact assessment procedure of Part 4 of this Act, which requires the proponent to prepare an Environmental Impact Statement (EIS) for the Proposal. Declaration does not infer State Government backing of the project and does not confer a status of "State Significance".

The Department of Infrastructure (DI) is managing the environmental impact assessment process on behalf of the CG. The DI has invited relevant Australian, State and local government representatives and authorities to participate in the process as Advisory Agencies.

The first step in the impact assessment procedure is the development of a Terms of Reference (ToR) for the preparation of an EIS. The process involves the formulation of a draft ToR that is made available for public and Advisory Agency comment. The CG has had regard to all comments received on the draft ToR in finalising the ToR, which will be presented to the proponent. This document represents the final ToR for the proposal.

The proponent is to prepare an EIS to address these ToR. A public notice is to be placed in relevant newspapers once the EIS has been prepared to the satisfaction of the CG and available for review. The notice will state where copies of the EIS are available for inspection and how it can be purchased; that submissions may be made to the CG about the EIS; and the submission period. The proponent may be required to prepare a Supplementary EIS to address specific matters raised in submissions on the EIS.

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

The statutory impact assessment process under the SDPWO Act is also the subject of a bilateral agreement between the Queensland and the Commonwealth Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The proponents referred the Proposal to the Australian Minister for the Environment and Heritage in accordance with the provisions of the EPBC Act. The Australian Minister decided, on 27 July 2006, that the Proposal constituted a controlled action under Section 75 of the EPBC Act. The Part 3, Division 1, controlling provisions are:

- Sections 12 & 15A (World Heritage);
- Sections 18 & 18A (Listed Threatened Species and Communities);
- Sections 20 & 20A (Listed Migratory Species); and
- Sections 23 and 24A (Marine Environment)

However, it must be noted that the Australian Minister will undertake a separate approval process following release of the CG's Report. The Minister will then grant, or refuse, approval for the controlled action under section 133 of the EPBC Act. The Minister may attach conditions to an approval, in addition to those set by the CG, if approved, to mitigate impacts on matters of NES.

General EIS format

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

- maps, diagrams and other illustrative material to assist in the interpretation of the information;

- a list of persons, interest groups and agencies consulted during the EIS;
- a list of advisory agencies consulted with an appropriate contact; and
- the names of, and work done by, all personnel involved in the preparation of the EIS.

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

Relevance of EIS process to the project

The Proposal involves development that would require an application for development approval for material change of use and/or impact assessment under the *Integrated Planning Act 1997* (IPA). Consequently, the CG report may, under s.39 of SDPWO Act, state one or more of the following for the assessment manager:

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

Alternatively the CG report must state for the assessment manager:

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

Further, the CG report must:

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

The relationship between the 'significant project' process under the SDPWO Act and development approval process under the IPA is noted in sections 36 to 42 of the SDPWO Act. Some key points to note include:

- the information and referral stage and the notification stage of the Integrated Development Assessment System (IDAS) do not apply to development applications to the extent the application is for a material change of use, or requires impact assessment;
- there are no referral agencies under the IPA for the applications to the extent the application is for a material change of use, or requires impact assessment;
- a properly made submission about the EIS is taken to be a properly made submission about the application under IDAS;
- the CG's Report is taken to be a concurrence agency's response for the applications to the extent the application is for a material change of use, or requires impact assessment; and
- providing a development application has been made and to the extent the application is for a material change of use, or requires impact assessment, the decision stage does not start until the CG gives the Assessment Manager a copy of the CG's Report.

Further to the approvals that will be sought through the IDAS process, other approvals under a range of legislation including, but not limited to IPA and the *Environmental Protection Act 1994* (EP Act), are likely to be required.

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

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Abbreviations

The following abbreviations have been used in this document:

ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
ASS	Acid Sulfate Soils
CAMBA	China-Australia Migratory Bird Agreement
CPM Act	*Coastal Protection and Management Act 1995*
CG	The Coordinator-General of the State of Queensland
CHMP	Cultural Heritage Management Plan
DUAP	Department of Urban Affairs and Planning (NSW)
EIS	Environmental Impact Statement
EM Plan	Environmental Management Plan
EP Act	*Environmental Protection Act 1994* (Qld)
EPA	Queensland Environmental Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPP (Air)	Environmental Protection (Air) Policy 1997
EPP (Noise)	Environmental Protection (Noise) Policy 1997
EPP (Water)	Environmental Protection (Water) Policy 1997
HAT	Highest Astronomical Tide
IDAS	Integrated Development Assessment System
IAS	Initial Advice Statement, as defined by Part 4 of the *State Development & Public Works Organisation Act 1971*
IPA	*Integrated Planning Act 1997* (Qld)
JAMBA	Japan-Australia Migratory Bird Agreement
NC Act	*Nature Conservation Act 1992*
NES	National Environmental Significance
NR&W	Queensland Department of Natural Resources and Water
RE	Regional Ecosystem
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
WGS	World Geodetic System
ToR	Terms of Reference as defined by Part 4 of the *State Development and Public Works Organisation Act 1971*

PART A - INFORMATION AND ADVICE ON PREPARATION OF THE EIS

Purpose of the Terms of Reference

These ToR essentially outline the issues that should be considered in preparing the EIS. However, the ToR should not be interpreted as excluding from consideration any matters which are currently unforeseen, which may arise during ongoing scientific studies or which may arise from any changes in the nature of the project during the preparation of the EIS, the community consultation process and associated documentation. In such circumstances, these matters should be included in the EIS.

The ToR also provides the framework for the EIS, including information on the purpose and role of the EIS and the factors considered significant for the project. It indicates the types of studies and the data that should be provided in the EIS. All potentially significant impacts of the proposed development on the environment are to be investigated, and requirements for the mitigation of any adverse impacts are to be detailed in the EIS. Any prudent and feasible alternatives should be discussed and treated in sufficient detail. The reasons for selection of the preferred option should be clearly identified. The nature and level of investigations should be relative to the likely extent and gravity of impacts.

The EIS should address at least the requirements as set out in these ToR.

EIS Guidelines

The objective of the EIS is to identify potential environmental impacts and to ensure that those impacts are avoided where possible. Impacts must be examined fully and addressed so that the development is based on sound environmental protection and management criteria where such impacts are unavoidable.

The term environment refers to:

(a) ecosystems and their constituent parts, including people and communities;
(b) all natural and physical resources;
(c) the qualities and characteristics of locations, places and areas, regardless of size, that stimulate biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and
(d) the social, economic, aesthetic and cultural conditions which influence, or are affected by, the entities and attributes mentioned in paragraphs (a) to (c).

The EIS process followed will be as specified in the SDPWO Act.

An EIS should provide:

- a description of the relevant aspects of the existing social, economic, natural and built environment;
- a description of the development project and means of achieving the development objectives;
- definition and analysis of the likely impacts of the development on the environment;
- a framework against which Government decision-makers can consider the environmental aspects of the project and set conditions for approval to ensure environmentally sound development;
- a definition of all significant impacts and a consolidated list of measures proposed to mitigate adverse effects; and
- recommendations on the need for and contents of any environmental management plans and/or operational plans to mitigate adverse effects.

EIS Objectives and Key Issues

Objectives

The objectives of the EIS are as follows:

- to provide information on the project and development process to the community and decision makers;
- to comprehensively identify and evaluate all relevant issues associated with the project;

- to identify all potential environmental, cultural, social, transport and land use planning impacts of the preferred concept, and recommend infrastructure and facilities needs together with other design and operational measures required to minimise or compensate for adverse impacts and enhanced benefits;
- to consult with the community and relevant stakeholders in the process of identifying, assessing and responding to the impacts of the project;
- to identify all necessary licences, planning and environmental approvals including approval requirements pursuant to State and Commonwealth legislation; and
- to provide an input to the decision-making process, assisting with the determination of whether to accept or modify the project, approve it with conditions or carry out further studies.

Key Issues

The issues to be addressed as part of the EIS can be divided into the following categories:

- detailed project description including all proposed uses for land based and marina facilities, project justification and alternatives;
- overall net public benefit of proposal including additional public facilities, access and services;
- impacts on surrounding land uses and land use planning, including

    - adjacent leases and developments or public use of land;
    - navigation and recreational use of the coast; and
    - height and bulk of buildings relative to surrounding landscape and uses;

- economic issues, including impacts on economic diversity in terms of local and regional businesses (including Airlie Beach) during construction and operational phases;
- impacts on social issues, including;

    - duration of adverse impacts and disruption to the amenity and economy of the surrounding localities;
    - impacts of service personnel (immediate and on-going) on housing, transport and other services; and
    - impacts on flight paths and aircraft movement to and from nearby airport facilities;

- impact on traffic/transport and public access, including

    - provision for short and long term car parking;
    - impacts on Proserpine Shute Harbour Road;
    - marine operations including water usage/allocation (eg. designated mooring bouys, lease areas, transit lanes) within Shute Bay;
    - impacts on existing and future public access to foreshores and the nearby marine environment;
    - provision of public boating facilities;
    - impacts and proposed management of additional marine traffic on surrounding localities (including islands);

- impacts on the marine and terrestrial environment, including;

    - aquatic, marine and terrestrial ecosystems, their biological diversity, integrity of ecological processes and landscapes, and conservation of resources wilderness and similar natural places;
    - water quality, tidal currents and siltation;
    - areas of cultural heritage value or indigenous and non-indigenous significance;
    - air quality;
    - noise and vibration;
    - waste resources and management (including sewerage, trade waste, and boat sullage);
    - suitability and impacts on geology and soils; and
    - visual impacts (immediate and on-going);

- hazards, risks, safety and emergency; and
- cumulative effects of all key issues.

The EIS will be required to consider in detail relevant issues under each of these categories and all other impacts on the physical and social environment. The information required is described in the following sections.

Results of Consultation on the draft Terms of Reference

Advertisements were placed in the 'Whitsunday Times' on Wednesday 25 October, 'The Guardian' on Thursday 26 October and the 'Courier Mail' and 'The Australian' newspapers on Saturday 28 October 2006, inviting public comment on the draft ToR for the Shute Harbour Marina Project. A similar notice was placed on the CG internet site.

The period for receipt of submissions closed on 27 November 2006, however late submissions were accepted until 11 December 2006. A total of 22 written submissions were received, including thirteen (13) from Government agencies. Copies of these have been forwarded to Shute Harbour Marina Development Ply Ltd.

The content of all submissions was reviewed and considered by the CG in finalising the ToR.

PART B - CONTENT OF THE ENVIRONMENTAL IMPACT STATEMENT

It is strongly recommended that the EIS follows the heading structure of these ToR to facilitate cross-referencing. This structure has been found through long experience to be the best option.

Executive Summary

The function of the executive summary is to convey the most important aspects and options relating to the proposed Shute Harbour Marina Project to the reader in a concise and readable form. The structure of the executive summary should follow that of the EIS, and focus strongly on the key issues and conclusions.

Glossary of terms

A glossary of technical terms, acronyms and abbreviations should be provided.

1 INTRODUCTION

The introduction provides reference to the location of Shute Harbour, explains why the EIS has been prepared and what it sets out to achieve. In particular, the introduction will address the level of detail of information required to meet the level of approval being sought. The project will undergo the assessment process under the SDPWO Act, Part 4 – Environmental Coordination for the Environmental Impact Assessment. The EIS will be tailored to meet the requirements for this process. The EIS should also define the audience to whom it is directed, and contain an overview of the structure of the document. Throughout the EIS, factual information contained in the document is to be referenced.

1.1 Project proponent

Provide details of the Proposal proponents, including details of any joint venture partners.

Provide details of any proceedings or other actions under a law of the Commonwealth or a State for the protection of the environment or the conservation and sustainable use of natural resources (an environmental law) against:

- the proponent; and
- the applicant(s) for any permit under an environmental law for the proposal.

Provide details of the proponent's environmental policy and planning framework.

1.2 Project description

A brief description of the key elements of the Proposal is to be provided and illustrated. Any major associated infrastructure requirements are also be summarised. Detailed descriptions of the Proposal are to follow in Section 3.

Provide a brief description of studies or surveys that have been undertaken for the purposes of developing the Proposal and preparing the EIS. This should include reference to relevant baseline studies or investigations undertaken previously.

1.3 Project objectives and scope

Provide a statement of the objectives which have led to the development of the Proposal and a brief outline of the events leading up to the Proposal's formulation, including alternatives, envisaged time scale for implementation and project life, anticipated establishment costs and actions already undertaken within the Proposal area.

Describe the current status of the Proposal and outline the relationship of the Proposal to other developments or

actions that may relate whether or not they have been approved. The consequences of not proceeding with the Proposal should also be discussed, incorporating an economic and social assessment.

1.4 The EIS process

The purpose of this section is to make clear the methodology and objectives of the environmental impact statement under the relevant legislation.

1.4.1 Methodology of the EIS

This section is to provide a description of the EIS process steps, timing and decisions to be made for relevant stages of the Proposal. This section must also indicate how the consultation process (which will be described in detail in section 1.5) would integrate with the other components of the impact assessment, including the stages, timing and mechanisms for public input and participation. The information in this section is required to ensure:

- relevant legislation is addressed;
- all key issues identified in the ToR are specifically addressed;
- readers are informed of the process to be followed; and
- stakeholders are aware of any opportunities for input and participation.

1.4.2 Objectives of the EIS

Having described the methodology of the EIS, provide a succinct statement of the EIS objectives. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The reader should be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the Proposal.

While the ToR provides guidance on the scope of the EIS studies, they should not be seen as exhaustive or limiting. It is important for proponents and their consultants to recognise that there cannot be perfect knowledge in advance of undertaking an EIS of what the EIS studies may find.

If it transpires during the preparation of the EIS that previously unforeseen matters not addressed in the ToR are found to be relevant to the assessment of impacts of the Proposal, those matters should be included in the EIS.

In addition, it is essential that the main text of the EIS addresses all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter should be raised for the first time in an appendix or the draft environmental management plan (EM Plan).

When considering whether an impact is or is not significant, the proponent is take account of both the intensity of the impact, the timeframe and longevity of the impact and the context in which it would occur.

The EIS is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the Proposal. As such the main text should be written in plain English avoiding jargon as much as possible. Additional technical detail may be provided in appendices. The main text should not assume that a reader would have a prior knowledge of the Proposal site. It should not be necessary for the reader to have visited the site to understand the issues involved in the Proposal.

In brief, the EIS objectives should be to provide public information on the need for and likely effects of the Proposal, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values, and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is a key aspect of the EIS.

The role of the EIS in providing the Proposal's draft EM Plan is also be discussed, with particular reference to the EM Plan's role in providing management measures that can be carried over into conditions that would attach to any approval(s) for the Proposal.

1.4.3 Submissions

The reader should be informed as to how and when public submissions on the EIS will be addressed and taken into account in the decision-making process.

The reader should also be informed of the standing of any submission they may make in regard to any application submitted by the proponent for statutory approval.

1.5 Public consultation process

To facilitate the assessment process, the proponent is strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process. This should include consultation with relevant indigenous traditional owner groups and the indigenous community.

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

The public consultation program must provide opportunities for community involvement and education. It may include interviews with individuals, information sessions, key stakeholder briefings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern to local community and interest groups and should continue from project planning through construction, ongoing operation and maintenance. Refer to the Environmental Protection Agency (EPA) guideline Issue Identification and Community Consultation.

Consultation should not be limited to Advisory Agencies. Consultation with stakeholder groups such as Sunfish, Queensland Seafood Industry Association, Whitsunday Seagrass Watch, Whitsunday Tourism, Great Barrier Reef Charter Association, Mackay-Whitsunday Natural Resource Management Group, Central Queensland Land Council and Traditional Owner groups with interests in the area of the proposed development and all other stakeholders as identified in the earlier EIS process and the Whitsunday Community should also occur.

1.6 Project approvals

1.6.1 Relevant legislation and policy requirements

This section should explain the legislation and policies controlling the approvals process. Reference should be made to the:

- EP Act;
- IPA;
- *Coastal Protection and Management Act 1995* (CMP Act);
- *Fisheries Act 1994*;
- *Marine Parks Act 2004*;
- *Transport Operations (Marine Safety) Act 1994* and *Transport Operations (Marine Safety) Regulation 2004*;
- *Transport Operations (Marine Pollution) Act 1995* and *Transport Operations (Marine Pollution) Regulation 1995*;
- *Maritime Safety Queensland Act 2002*;
- *Transport Infrastructure Act 1994* and *Transport Infrastructure (SCR) Regulation 2006*;
- *Transport Planning and Coordination Act 1994*;
- *Transport Operations (Road Use Management) Act 1995*;
- *Land Act 1994* ; and
- other relevant Queensland laws.

Any requirements of the Commonwealth EPBC Act and the *Great Barrier Reef Marine Park Act 1975* (including the Whitsunday Plan of Management 1999), should also be included.

Identify all approvals required for the proposal, cross linked with their respective legislation (see also Appendix A2). The EIS should differentiate between the documents that must be considered when assessing and deciding applications (e.g. planning scheme, State Planning Policies, s1.2 of the IPA, resource allocations under the *Fisheries Act 1994* etc) and documents that may be relevant to addressing the matters that must be considered (e.g. WHAM Regional Plan etc).

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

Detail the likely application combinations and the assessment manager for those applications, including whether the Minister administering the IPA must decide the assessment manager.

List any concurrence agencies for the development applications, taking into consideration requirements of the SDPWO Act in relation to concurrence agencies. Details should also be included in relation to the volume of sand that will be required for the reclamation and the approval processes for allocation from the source.

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

1.6.2 Planning processes and standards

This section should discuss the Proposal's consistency with existing land uses or long-term policy framework for the area (e.g. as reflected in local and regional plans), and with legislation, standards, codes or guidelines available to monitor and control operations on site. This section should refer to all relevant State and regional planning policies and studies (whether draft or final) including the "*Shute Harbour Planning Study Interim Report – Issues and Directions (May 2007)*". This information is required to demonstrate how the Proposal conforms to State, regional and local plans for the area.

Existing and publicly available draft Whitsunday Shire Council planning schemes are to be consulted in this section. Specifically, provide planning grounds to justify the Proposal against the statements of intent for each preferred dominant land use designation of the Whitsunday Shire Council Transitional Planning Scheme – Strategic Plan, which applies to the subject site.

The section should 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) including Whitsunday Hinterland and Mackay Regional Plan; and
- relationship to other significant developments (existing or proposed) in the study area or surrounding areas.

1.7 Accredited process for controlled actions under Commonwealth legislation

The Proposal is a controlled action under the Commonwealth's EPBC Act and the Commonwealth has accredited the State's EIS process for the purposes of the Commonwealth's assessment under Part 8 of that Act.

The EIS must provide a stand-alone report as an appendix to the EIS that exclusively and fully addresses the potential impacts on the matters of National Environmental Significance (NES) that were identified in the 'controlling provisions' when the Proposal was declared a controlled action. These are also noted in the Preface of this ToR. Further guidance on the content of this stand alone report is provided at Appendix A3 of this ToR.

2 PROJECT NEED AND ALTERNATIVES

2.1 Project justification

The justification for the Proposal should be described, with particular reference made to the economic and social benefits, including employment and spin-off business development, which the Proposal may provide and make reference to the need for the development in context of any marina demand studies as well as other approved developments in the surrounding region that provide additional berths.

Provide a revised assessment of the Shute Bay site as a suitable marina location within the Whitsunday region in the context of the "Primary level constraints" listed in the Whitsunday Region Marina Demand Analysis (2001) if this analysis is used as justification for selection of the site for a marina development.

Justification must include a demonstration of demand for the various components of the Proposal such as marina berths, boat ramps and similar facilities, accommodation (permanent and tourist), retail and commercial facilities. Specifically provide justification for such a large number of berths for very large vessels. The status of the Proposal should be discussed in a regional, State and national context.

This section must also provide a detailed critique of the justification for the Proposal in the context of the "*Shute Harbour Planning Study Interim Report – Issues and Directions (May 2007)*".

2.2 Alternatives to the project

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

Alternatives should examine reconfigured options with different accommodation forms and densities to determine the optimum configuration for the development that minimises impacts to Shute Bay (particularly the reclamation of tidal lands as opposed to increased land based development, and impacts to water processes and sedimentation patters within the impacted area) while also ensuring no significant net increase in demand for marina facilities will occur in the region.

Provide a comparative analysis of the alternative configurations in the context of the "*Shute Harbour Planning Study Interim Report – Issues and Directions (May 2007)*".

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

Reasons for selecting the preferred option should include technical, commercial, social and natural environment aspects.

3 DESCRIPTION OF THE PROJECT

The objective of this section is to provide a detailed description of the Proposal through its lifetime of construction and operation. This information is required to allow assessment of all aspects of a project including all phases of the Proposal from planning, construction and through operation. It also allows further assessment of which approvals may be required and how they may be managed through the life of the Proposal.

3.1 Overview of project

Provide an overview of the Proposal to put the Proposal into context. Provide a description of the key

components of the Proposal. Provide the expected project cost and overall expected project duration and timing.

Summarise the employment benefits from the Proposal from the construction and operations phases. Provide a summary of any environmental design features of the Proposal.

3.2 Ecological sustainable development

Provide a comparative analysis of how the Proposal conforms to the objectives for "ecological sustainable development" (see the National Strategy for Ecologically Sustainable Development (1992) available from the Australian Government Publishing Service).

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

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.

3.3 Location

3.3.1 Regional context

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

3.3.2 Local context

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

- the location and boundaries of land tenures, in place or proposed, to which the Proposal area is or will be subject;
- the location and boundaries of the Proposal footprint (including any access channels etc);
- the road network servicing the area including road names;
- the location of any proposed buffer areas or buffer zones surrounding the Proposals' working areas;
- the local government boundary; and
- the location of environmentally sensitive receptors on and off the site potentially affected by the development such as residences, National Park, Marine Park (State and Commonwealth) and World Heritage areas, high value marine and terrestrial ecosystems and existing commercial and recreational coastal facilities.

These features should be overlain on rectified air photograph enlargements (in separate outline and infill maps) to illustrate components of the Proposal in relation to the natural and built features of the area.

The location and boundaries of the Proposal footprint and the location of any proposed buffer areas or buffer zones surrounding the Proposal's working area should be provided in latitude and longitude with minutes to three decimal points to World Geodetic System (WGS) 1984 datum, shown on a marine chart. Planned developments and existing marine infrastructure including infrastructure below Highest Astronomical Tide (HAT) is also to be shown on a marine chart to the same level of detail.

3.4 Construction

The extent and nature of the Proposal's construction phase should be described. The description should include sources of construction materials, proposed modes of transport for the construction materials, the type and methods of construction, the construction equipment to be used and the items of plant and materials to be transported onto the construction site and impacts on the transport network, amenity and economy of nearby

localities likely to be affected by such activity. Any staging of the Proposal should be described and illustrated showing site boundaries, development sequencing and timeframes. The estimated numbers of people to be employed in the Proposal construction phase should also be provided with a brief description of the skills required, whether these skills are currently available in the area and where those people may be accommodated and how they will be transported to the site.

3.4.1 General construction methods and program

Provide a detailed construction schedule and construction staging plan(s) showing the staging of the development and location of environmental controls at all stages (eg. sheet piling, silt curtains). This should include/address any restrictions on other uses and users and any dangers to other users.

Provide a detailed discussion of the methods of construction of:

- breakwaters, bunds and revetments;
- the marina basin and access channel; and
- piles and floating pontoons; including information on:

    - location and timing of placement of sheet piling and rock-armoured revetments;
    - excavation and dredging, rehandling and disposal areas;
    - water quality management including the location, design, and timing of deployment of silt curtains and other management measures:
    - the type of equipment to be used;
    - any 'securing' that may be required during extreme weather conditions such as cyclones; and
    - reclamation and the stabilisation methods for reclamation using dredge spoil.

Provide a detailed cut and fill balance model that identifies the source of construction materials, in particular source of fill material and quantities of material from each source.

Provide a detailed discussion of alternative construction methodologies and recommended methodologies, justified in terms of minimising adverse impacts on coastal processes, water quality, marine and terrestrial biodiversity and the community. If blasting is to be used, provide justification for this activity and a detailed management plan including and assessment of potential impacts on the existing Proserpine Shute Harbour Road reserve or its users. The management plan must provide mitigation measures including a detailed traffic management plan.

3.4.2 Dredging

Provide a detailed discussion of the dredging requirements, including:

- the timing of capital and maintenance dredging and spoil disposal in terms of avoiding or minimising impacts on turtles, dugongs, cetaceans, and fish behaviour (including migrations) and on marine plant propagation. The likely duration and frequency of maintenance dredging and spoil disposal needs are to be examined in the same context;
- the location, area and volume of dredging required within Shute Bay for the proposed marina and boating access channel and the methods and sites for disposal/rehandling via land or sea including dredging requirements for shipping/waterborne transport required for construction;
- all alternatives to the proposed methods of dredged spoil disposal;
- access to the disposal areas, the dimensions of disposal areas (both capital and maintenance) as well as any proposed tenure stipulations of any land to be designated dredge spoil disposal/rehandling areas;
- dimensions and capacity of dredge spoil rehandling areas and how they cater for the expected quantities of maintenance dredge spoil (allowing for bulking of materials by water) over the anticipated maintenance dredging intervals (including visual and access impacts);
- dredging methods and the methods of minimising dredging plumes,the impacts on turtles and dugongs and associated visual and other environmental impacts;;
- water quality contaminant release level/criteria at which reclamation, dredging and other construction activities must cease if the release level/criteria are exceeded;
- the potential rate of sedimentation within the marina and access channels through appropriate

hydrodynamic modelling techniques;
- the expected amount of maintenance dredge spoil generated within the marina and access channels and the expected frequency of maintenance dredging;
- any buffering facilities that will be provided between spoil areas and adjoining areas;
- where a secondary use is proposed for areas designated as spoil areas (eg. future maintenance dredging spoil area / park), provide details of the proposed tenures and the expected timeframe for when the secondary uses could expect to commence;
- arrangements to be put in place for long term management of maintenance dredging operations, long term dredge spoil disposal & rehandling facility and how the dredge spoil site is to be managed, including details of the party responsible for the long-term maintenance dredging operations. If this party is not the proponent, provide a copy of written acceptance of responsibility for maintenance dredging from the other party;
- provisions for maintenance dredging in the event of a major cyclone/extreme conditions;
- how dredging plumes, dredged material releases to waters and loss of depth in the marina and access channel due to siltation is to be managed by the proponents; and
- expected life of the dredge spoil rehandling area and future dredge spoil disposal options once capacity has been reached.

3.5 Infrastructure requirements

This section should provide descriptions, with concept and layout plans, of requirements for constructing, upgrading or relocating all infrastructure in the vicinity of the Proposal area. The matters to be considered include such infrastructure as roads, bridges, jetties, ferries, tracks and pathways, power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

3.5.1 Road

Describe arrangements for the transport of equipment, products, wastes, personnel and patrons during both the construction phase and operational phases of the Proposal. The description should address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure. The investigation should be based on only one access point to Proserpine Shute Harbour Road from the development.

Information should be provided on road transportation requirements on public roads (both State and local) for both construction and operations phases, including:

- the volume, composition (types and quantities), origin and destination of goods to be moved including construction materials, raw materials, wastes, and hazardous materials;
- the volume of traffic generated by workforce personnel, visitors and service vehicles (including public transport needs);
- method of movement (including vehicle types and number of vehicles likely to be used);
- the area, location and management of short and long term car parking requirements by workforce personnel and visitors;
- anticipated times at which movements may occur;
- details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition);
- the proposed transport routes; and
- need for upgrading/widening of Proserpine Shute Harbour Road, the road reserve, and increased road maintenance.

Describe site specific roadwork relating to road access to the development and the method of providing for public passenger transport and pedestrian/cyclist access to and from the development along the Proserpine Shute Harbour Road (both directions).

Department of Main Roads' Guidelines for the Assessment of Road Impacts of Development Proposals must be referred to when assessing road impacts.

3.5.2 Shipping/Waterborne Transport

Provide details of the impacts and management of infrastructure requirements for the proposed transport of fill and other materials to the site by coastal barge including

- the location of any proposed infrastructure;
- details of the type of infrastructure;
- whether the infrastructure will be temporary or will remain as part of the site development;
- the type, length and draft of vessels (barges);
- proposed anchoring points;
- details of whether the vessels can access the site given the existing water depths or whether there is need for dredging of an access channel.

Provide a marine traffic study of Shute Bay and adjoining waters, complete with marine traffic safety and management requirements, risk analysis and mitigation plans. The following is to be considered:

- known future developments such as a third barge ramp and proposed four lane boat ramp;
- the development's quay lines;
- impacts on current marine activity between the marina opening to Low Rocks and the southern channel;
- whole of waterway risk including barge operations, marina traffic and recreational boating;
- risk mitigation for integration of regular and ad hoc vessel operations at the existing harbour and bay infrastructure;
- numbers of sand supplement barges operated by the proponent, their size and barge scheduling;
- risk mitigation and management for all vessel operations in the northern half of the Bay and including the southern channel;
- impact of the development on adjacent land holders water access requirements;
- requirements to enhance the Bay as a "safe haven/cyclone access" for the general boating public and to "increase public safety";
- required channel depths to provide for under keel clearance of 10% of a vessels draft for manoeuvring and 0.6M for berthed vessels;
- requirements to ensure that training of bare boat charter hirers does not occur in the waters of Shute Bay from the proposal;
- provision for review of oil spill kits supplied by proponents and training for vessel operators in the marina;
- the displacement of buoy mooring authority holders to other locations and how this can be mitigated (where necessary);
- all waterborne activities with the Bay and proposed channels; and
- protection of existing marine infrastructure including aids to navigation.

Provide details on how and where vessels will be serviced and maintained without a marine service facility included in the development i.e. boatyard hardstand.

3.5.3 Energy

The EIS should describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the Proposal including the incorporation of energy efficient design principles. The locations of any easements should be shown on the infrastructure plan. Energy conservation should be briefly described in the context of any Commonwealth, State and local government policies. If upgrading of electricity supply infrastructure is required, provide details of the intended route with respect to existing property boundaries.

3.5.4 Water supply and storage

The EIS should provide information on the proposed water usage by the Proposal, including the quality and quantity of all water supplied to the site during the construction and operational phases. In particular, the proposed sources of water supply should be described (eg bores, dams, weirs, municipal water supply pipelines, surface storages etc) given the implication of any approvals required under the *Water Act 2000*.

Estimated rates of supply from each source (average and maximum rates) should be given. Any proposed water conservation and management measures should be described including water saving landscaping and on-site effluent re-use.

Determination of potable water demand should be made for the Proposal, 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. If upgrading is required provide details of the intended route with respect to existing property boundaries.

Impacts on council's reticulated water supply network and any alternative on-site water storage for fire fighting and other emergency purposes should also be detailed.

3.5.5 Stormwater drainage

A description should be provided of the proposed stormwater drainage system, and the proposed disposal and management arrangements, including any off site services throughout construction and for operation of the final development.

Provide detailed information to demonstrate best practice stormwater management including:

- an assessment of changes in stormwater hydrology that would result from the development;
- an estimation of the concentration and load of suspended sediment, nitrogen and phosphorus predicted to be exported from the development compared with pre-development;
- an assessment of the impact of the development on cross and longitudinal drainage and recommend appropriate drainage treatment and structures to accommodate a Q50 event for the realigned/existing Proserpine Shute Harbour Road; and
- details of quality improvement devices (sediment removal, gross pollutant traps, flow velocity reduction), and design of any discharge points, to demonstrate that stormwater can be effectively managed and discharged without causing localised erosion and/or adverse impact on the marine environment adjoining the development for all reasonably anticipated rainfall events.

3.5.6 Telecommunications

The EIS should describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure. If upgrading is required provide details of the intended route with respect to existing property boundaries.

3.5.7 Accommodation and other infrastructure

A description should be provided of any other developments directly related to the Proposal and assessment of impacts not described in other sections, such as:

- location of site offices and construction camps;
- new permanent or temporary fuel storage areas (eg diesel, petrol, oil, etc);
- new permanent or temporary chemical storage areas;
- equipment hardstand and maintenance areas;
- technical workshops or laboratories;
- long and short term car parking facilities; and
- boat ramp and barge facilities (temporary and on-going).

The method of operation of these areas and how these sites are to be accessed should also be addressed.

3.5.8 Transport Infrastructure Demand

Detail the current level of demand for transport infrastructure within the Proposal vicinity including public passenger transport, courtesy coaches, recreational boating and commercial marine operations.

Quantify the (foreseeable) future demand for transport infrastructure within the vicinity of the Proposal for the scenarios of with and without the Proposal.

Provide details of any proposals (eg contributions to a third party) to mitigate/offset any increase in demand, if the future demand for specific transport infrastructure (eg public boat ramps) would exceed the capacity of current infrastructure facilities due to the construction of the proposal.

[Note: Facilities for scheduled public passenger transport should be separate from facilities for courtesy coaches.]

3.6 Waste Management

3.6.1 Character and quantities of waste materials

Provide an inventory of all wastes (types and volumes) generated by the proposal during construction and operational phases of the Proposal.

The development of waste management measures must have regard for best practice waste management strategies and the Environmental Protection (Waste) Policy, the Proposal's strategy for waste avoidance, reuse, recycling, treatment and disposal should be described in the appropriate sub-section below.

Cleaner production waste management planning should be detailed especially as to how these concepts have been applied to preventing or minimising environmental impacts.

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

Air emissions

Describe the quantity and quality of all air emissions (including particulates, fumes and odours) from the Proposal during construction and operation. Particulate emissions include those that would be produced by any construction or industrial process at the site or disturbance by wind action on spoil stockpiles or by transportation equipment. Monitoring at sensitive receptors should be undertaken and dust suppression and mitigation measures proposed to address these results.

The methods to mitigate impacts from air emissions should be described in section 4.5.

Solid waste disposal

The proposed waste minimisation strategies, recycling and re-use of solid waste and location and suitability of any landfill to receive solid waste from construction and operational phases of the proposal as a last resort should be identified.

Provide detailed information on sullage and vessel pump out stations.

Liquid waste

A description should be presented of the origin, quality and quantity of wastewater and any immiscible liquid waste originating from the Proposal. Particular attention should be given to the capacity of wastes to generate acidic, saline or sodic conditions. 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;
- drainage (i.e. run-off plus any seepage or leakage);
- seepage from other waste storages;
- wastewater from:

- dust suppression
- domestic purposes;
- evaporation;
- boat sullage treatment and disposal, and impacts on council's sewerage treatment facilities; and
- domestic sewage treatment; and

- surface and groundwaters that leave the site should not be degraded. Current and future water quality should be maintained at levels that are acceptable for users downstream of the site

Management of waste

The proposed management of these wastes should be detailed with consideration given to the suitability of available waste disposal options (with particular regard to proposed waste minimisation, recycling and re-use strategies). Particular attention should be given to the capacity of wastes to generate acidic, saline or sodic conditions.

3.7 Financial feasibility

This part of the EIS may be confidential if requested by the proponent.

This section shall detail the financial feasibility of the Proposal and alternatives (including existing and proposed lease areas), including details of costs of development and ongoing maintenance and operational costs; the capacity of the proponents to satisfactorily develop the Proposal; fare 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.

An assessment of financial feasibility will be based on industry knowledge and experience to incorporate maintenance and long term costs. 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 VALUES AND MANAGEMENT OF IMPACTS

The functions of this section are:

- to describe the existing environmental values of the area which may be affected by the Proposal. Environmental values are defined in section 9 of the EP Act, environmental protection policies and other documents such as the ANZECC 2000 guidelines, Queensland Water Quality Guidelines 2006, State Coastal Management Plan, Draft Mackay-Whitsunday Regional Coastal Management Plan and South East Queensland Regional Water Quality Management Strategy. Environmental values may also be derived following recognised procedures, such as described in the ANZECC 2000 guidelines. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS;
- to describe the potential adverse and beneficial impacts of the Proposal on the identified environmental values. Any likely environmental harm on the environmental values should be described;
- to describe any cumulative impacts on environmental values caused by the Proposal, either in isolation or by combination with other known existing or planned sources of contamination or activities.
- to present environmental protection objectives and the standards and measurable indicators to be achieved; and
- to examine viable alternative strategies for managing impacts. These alternatives should be

presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives should be discussed.

This section should detail the environmental protection measures incorporated in the planning, construction, operations, rehabilitation and associated works for the Proposal. Measures should maintain environmental values outside the area subject to development; minimise environmental impact and maximise socio-economic and environmental benefits of the Proposal. Preferred measures should be identified and described in more detail than other alternatives.

Environmental protection objectives may be derived from legislative and planning requirements which apply to the Proposal including Commonwealth strategies, State planning policies, local authority strategic plans, environmental protection policies under the EP Act, and any catchment management plans prepared by local land care groups. Special attention should be given to those mitigation strategies designed to protect the values of any sensitive areas and any identified ecosystems of high conservation value within the area of possible project impact.

This section should address all elements of the environment, (such as land, water, coast, air, waste, noise, nature conservation, cultural heritage, social and community, health and safety, economy, hazards and risk) in a way that is comprehensive and clear. To achieve this, the following issues should be considered for each environmental value relevant to the Proposal:

- environmental values affected: describe the existing environmental values of the area to be affected including values and areas that may be affected by any cumulative impacts (refer to any background studies in Appendices - such studies may be required over several seasons). It should be explained how the environmental values were derived (e.g. by citing published documents or by following a recognised procedure to derive the values);
- impact on environmental values: describe quantitatively the likely impact of the Proposal on the identified environmental values of the area. The cumulative impacts of the Proposal must be considered over time or in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts. In particular, any requirements and recommendations of the relevant State planning policies, environmental protection policies, national environmental protection measures and integrated catchment management plans should be addressed;
- cumulative impacts on the environmental values of land, air and water and cumulative impacts on public health and the health of terrestrial, aquatic and marine ecosystems, must be discussed in the relevant sections;
- where impacts from the Proposal will not be felt in isolation to other sources of impact, it is recommended that the proponent develop consultative arrangements with other industries in the Proposal's area to undertake cooperative monitoring and/or management of environmental parameters. Such arrangements should be described in the EIS;
- environmental protection objectives: describe qualitatively and quantitatively the proposed objectives for enhancing or protecting each environmental value. Include proposed indicators to be monitored to demonstrate the extent of achievement of the objective as well as the numerical standard that defines the achievement of the objective (this standard must be auditable). The measurable indicators and standards can be determined from legislation, support policies and government policies as well as the expected performance of control strategies. Objectives for progressive and final rehabilitation and management of contaminated land should be included;
- control strategies to achieve the objectives: describe the control principals, proposed actions and technologies to be implemented that are likely to achieve the environmental protection objectives; include designs, relevant performance specifications of plant, equipment and structures. Details are required to show that the expected performance is achievable and realistic;
- monitoring programs: describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting projects;
- auditing programs: describe how progress towards achievement of the objectives will be measured, reported and whether external auditors will be employed. Include scope, methods and frequency of auditing proposed;
- management strategies: describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented eg. continuous improvement framework including details of corrective action options, reporting (including any public reporting), monitoring, staff training, management responsibility pathway, and any environmental management systems

and how they are relevant to each element of the environment; and
- information quality: information given under each element should also state the sources of the information, how recent the information is, how any background studies were undertaken (eg intensity of field work sampling), how the reliability of the information was tested, and what uncertainties (if any) are in the information.

It is recommended that the EIS follows the heading structure shown below and distinctions should be made between the different phases of the Proposal (ie. construction, operational etc). The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the EM Plan for the Proposal (see Section 5).

4.1 Land

4.1.1 Description of environmental values

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

4.1.1.1 Topography/geomorphology/bathymetry

Maps should be provided locating the Proposal in both regional and local contexts. The topography of the Proposal site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum. Significant features of the locality should 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 4.1. Commentary on the maps should be provided highlighting the significant topographical features, specifically:

- all levels between HAT and Lowest Astronomical Tide;
- levels taken at every significant change in grade (eg. drop off or plateau point) so as to accurately define the profile of the bed and banks along the section; and
- levels taken at depth increments of no more than 0.5m intervals from HAT throughout the works area and continue to 100m beyond any disturbance point (including the proposed access channel).

For any maps (charts) showing detail below HAT the same information must be provided on marine charts showing detail locations in latitude and longitude in minutes to 3 decimal places to WGS 1984 datum.

4.1.1.2 Geology

The EIS should provide a description, map and a series of cross-sections of the geology of the Proposal area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance both terrestrial and marine. 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 Proposal should 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 should address the potential for significant finds.

Provide geotechnical details of the strata below the proposed lands to be reclaimed and the marina basin and confirm the types of foundations and support structures for both the buildings and the marina berths.

4.1.1.3 Soils

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

Soil profiles are to be mapped at a suitable scale and described according to the Australian soil and land survey field handbook (McDonald et al, 1990) and Australian soil classification (Isbell, 1996). An appraisal of the depth and quality of useable soil should be undertaken and particular reference should be given to the physical and chemical properties of marine muds including location and depth of these muds across the entire site, that will influence dewatering rates, sediment settling rates/suspended solids content of discharge water, displacement by revetment walls, erosion potential, storm water run-off quality and site stability.

An acid sulfate soil (ASS) investigation, that meets the standards set out in Guidelines for Sampling and Analysis of Lowland ASS in Queensland 1998 Ahern, Ahern and Powell or any subsequent updates as they become available, should 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 ASS Investigation Team (of Department of Natural Resources and Water (NR&W)) must be provided. If any previous partial investigations have already been conducted then these should 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 should be performed and included in the overall investigation. The ASS Investigation must clearly define the extent of all potential and actual ASS (if any) on the site and must adequately characterise 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.

4.1.1.4 Land use

The EIS should provide a description of current land tenures and land uses (both terrestrial and marine), including cultural heritage issues, in the Proposal area, with particular mention of land with special purposes. The location and owner/custodians of native title in the area and details of native title claims should be shown. Describe any proposed changes to the current lease such as land not required for development purposes or proposed extension to the lease.

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

4.1.1.5 Infrastructure

The location and owner/custodians of all existing and proposed (eg development application submitted) marine infrastructure such as boat ramps and mooring buoys, parking facilities, public passenger transport infrastructure in the Proposal vicinity, tenures, reserves, roads and road reserves and the like, covering the affected land should be shown on maps of a suitable scale. Indicate locations of existing and proposed gas and water pipelines, power lines and any other easements. Describe the environmental values affected by this and other infrastructure required for the Proposal.

4.1.1.6 Sensitive environmental areas

The EIS should identify whether areas that are environmentally sensitive could be affected, directly and indirectly, by the Proposal. Areas sensitive to environmental harm caused by the Proposal can be determined through site-specific environmental impact assessment.

In particular, the EIS should indicate if the land or marine environment affected by the Proposal is, or is likely, to become part of the protected area estate, or is subject to any treaty. Consideration should be given to national parks, conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA)), areas of cultural significance, areas of State significance (natural resources) as defined by the State Coastal Management Plan and identified in the draft Mackay-Whitsunday Regional Coastal Management Plan and scientific reserves (see section 4.7 for guidance on sensitive areas).

To obtain copies of plans of declared fish habitat areas contact Queensland Fisheries Service of the Queensland Department of Primary Industries and Fisheries at the call centre 13 25 23 or visit

http://www2.dpi.qld.gov.au/fishweb/13402.html.

The proximity of the Proposal elements to any of these areas should be identified.

4.1.1.7 Landscape character

This section should describe in general terms the existing character of the landscape that will be affected by the Proposal. It should comment on any changes that have already been made to the natural landscape since European settlement. It should '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, boats, designated scenic routes, etc.) that have amenity value.

4.1.1.8 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 and address or show the short and long term visual impacts of the proposal (including the likely effect of signage, hoardings and commercial lighting in terms of the natural context of the area) and the proposed methods of ameliorating adverse impacts. 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;
- identification of elements within the Proposal that may have an adverse impact on the image of the surrounding area as discussed in the council's local government strategic plan, with specific regard to proposed heights of buildings;
- scale and bulk of the proposal in terms of its representation as distinct dwelling house based and apartment style development relative to other similar development in the shire;
- identify any recognised scenic protection or scenic management areas within or adjacent to the subject area that are included in the council's town planning scheme and the likely impact of the Proposal upon those areas;
- major views, view sheds, existing land and sea based viewing outlooks, ridgelines (including the Whitsunday Great Walk) and other features contributing to the amenity of the area, including assessment from the water and private residences in the affected area;
- focal points, landmarks (built form or topography), gateways associated with project site and immediate surrounding areas, waterways, and other features contributing to the visual quality of the area and the Proposal 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.

4.1.2 Potential impacts and mitigation measures

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

4.1.2.1 Land use suitability

The potential for the construction and operation of the Proposal to adversely impact on the operation, redevelopment or public use of land adjacent to the site should be detailed.

The potential environmental harm caused by the Proposal on the adjacent areas currently used for agriculture,

urban development, recreation, tourism, other business and the implications of the Proposal for future developments in the impact area including constraints on surrounding land uses should be described.

Outline incompatible land uses, whether existing or potential, adjacent to all aspects of the Proposal, including essential and proposed ancillary developments or activities. Areas directly or indirectly affected by the construction and operation of these activities should be identified and measures to avoid unacceptable impacts defined.

Describe any constraints or precautions imposed on the development by the identified soil properties with respect to load-bearing capacity in particular consider the suitability of in-situ material including marine sediments as a base for reclamation and for the foundation of breakwaters, revetments and other structures such as piles and anchors for floating breakwaters.

4.1.2.2 Land disturbance

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

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

Prepare an ASS management plan. Management of ASS must be based on the ASS assessment in accordance with the Guidelines for Sampling and Analysis of Lowland ASS in Queensland 1998 or any subsequent updates as they become available, and management and monitoring plans prepared in consultation with officers of the NR&W and the EPA. Reference must be made to the Soil Management Guidelines (Dear et al. 2002), Instructions for the Treatment and Management of ASS (EPA 2001), the State Planning Policy 2/02, "Planning and Managing Development involving ASS" (eg. 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 reclamation works and the surrounding environment.

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

If geological conditions are conducive, the proponent should 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.

4.1.2.3 Land contamination

The EIS should describe the possible contamination of land from aspects of the Proposals including waste, acid generation from exposed sulfidic material and spills at chemical and fuel storage areas and any other potential sources of contamination.

The means of preventing land contamination (within the meaning of the EPAct) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined. Intentions should 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.

A preliminary site investigation 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) should be undertaken to determine background contamination levels. The results of the preliminary site investigation should be summarised in the EIS and provided in detail in an appendix.

If the results of the preliminary site investigation indicate potential or actual contamination, a detailed site

investigation progressively managed in accordance with the stages outlined in Appendix 5 of the "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland" should be undertaken.

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.

In addition to the requirements outlined in section 3.4.2 of this document, material to be dredged must be characterised in accordance with the "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland". This information must be incorporated into the information required under section 3.4.2.

The EIS should 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).

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

4.1.2.4 Soil erosion

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

The report should 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;
- dams, banks and creek crossings; and
- tidal and subtidal areas.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to (a) preventing soil loss in order to maintain land capability/suitability, and (b) preventing degradation of local waterways and Shute Bay by suspended solids.

4.1.2.5 Landscape character

Describe the potential impacts of the Proposal on the landscape character of the site and the surrounding area. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, due to dredge spoil rehandling areas, and vegetation clearing.

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

4.1.2.6 Visual amenity

This section should analyse and discuss the visual impact of the Proposal on particular panoramas and outlooks, including but not limited to the Whitsunday Great Walk, Conway National Park, Great Barrier Reef Marine Park and Worlds Heritage areas. 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, water and other known vantage points day and night, during all stages of the Proposal as it relates to the surrounding landscape. The assessment is to address the visual impacts of the Proposal 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 Proposal.

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

4.1.2.7 Lighting

Management of the lighting of the Proposal, 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;
- interference with the visibility of any existing and any new navigational aids including but not limited to lead lights, beacons and buoys to the satisfaction of the Regional Harbour Master in accordance with s92 *Transport Operations (Marine Safety) Act 1994*; and
- changed habitat conditions for nocturnal terrestrial and marine fauna and associated impacts.

4.2 Transport

4.2.1 Road

The Department of Main Roads' Guidelines for the Assessment of Road Impacts of Development (2006) must be referred to when assessing road impacts in consultation with Main Roads' Mackay District office Transport Planning Section.

The EIS must provide sufficient information to make an independent assessment of how the State-controlled and local government road networks will be affected. Discuss the capacity of the Shute Harbour Road in relation to its ability to accommodate this development and any identifiable consequential usage of the road (eg. increase patronage of the area by day trippers and boat ramp users). Traffic impacts of the proposed development must be modelled based on no less than the land uses indicated in the transitional Whitsunday Shire Planning Scheme and the IPA compliant draft Whitsunday Shire Planning Scheme along Shute Harbour Road from Airlie Beach CBD. The impact on stakeholders along the whole route must be detailed and a description of how any impacts will be managed.

The EIS must include detailed analysis of probable impact of identified construction and operational traffic generated by the Proposal with particular concern to impacts on road infrastructure (including accelerated damage and increased maintenance), road users (including pedestrians and cyclists) and road safety, including how parking of vehicles associated with the development will be addressed. Operational traffic should include heavy vehicles associated with removal of material from the long term dredge material disposal and rehandling facility.

The EIS needs to identify impacts on the State-controlled and local government road networks and to indicate clearly the corrective measures necessary to address adverse road impacts and the costs involved. This will require the proponent to compare the traffic situation and road conditions with, and without, the Proposal.

Information about the impacts and proposed measures for dealing with those impacts should be prepared by the proponent in close consultation with the Department of Main Roads.

Provide information on product spill contingency plans and the adequacy of equipment and facilities to deal with possible spills for the transport nodes of the Proposal. Indicate whether there is a need to update the plans based on increase in frequency of traffic and volumes to be transported.

The EIS should outline details of any potential impacts on existing or proposed public passenger transport, pedestrian and cycle networks and operations.

4.2.2 Water/Air based

The EIS should address the potential impacts on privately owned port authority, or government operated ports and transit facilities and State-controlled, Commonwealth-controlled, local government controlled or privately owned airports.

The EIS should address the following water transport issues:

- the potential of the Proposal to impact on water and land based recreational and commercial activities within and adjoining Shute Bay including:

  - the need for additional public boat ramps, facilities and parking (for vehicle and trailers);
  - all-tide ramp status;
  - wave climate;
  - impact on adjacent ferry terminal and fuelling stations;
  - commercial boat operators;
  - commercial boat cleaning / slipway facilities
  - current mooring owners;
  - management and control of boat ramps (include ownership proposals);

- a review of the need for this project to provide additional recreational boat launching facilities to ensure reasonable availability of boat launching facilities in the region;
- proposals for the coordination of vessel navigation within and external to the marina (i.e. including access channels) including the capacity of the marina to accommodate the proposed berths in relation to vessel access and circulation during all weather and tidal conditions during construction and operation;
- detailed information on the additional pressure that will be placed on existing passenger transport infrastructure particularly if the proposal is predicated on achieving increased visitation to the region;
- impact of increased regional recreational and commercial boat traffic within the Whitsundays as a result of the proposal;
- specifically address the likely impacts of an increase in tourist visits on the existing transport system; and
- indicate any potential for interchanging between transport modes (e.g. private car, coaches, charter boats, air).

The EIS should address the following air transport issues:

- proximity to existing and known future flight paths and likely impact on expected air traffic movements;
- impact on air safety; and
- measures to mitigate noise impact from adjoining airfield activities.

4.3 Climate

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (eg 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 storm tide, floods, cyclones and bushfires and impacts of long term global warming should also be addressed and be evaluated against State Planning Policy 1/03 Mitigating the impacts of flood, bushfire and landslide and section 2.2.4 Coastal Hazards in the State Coastal Management Plan with reference to the EPA guideline “Mitigating the adverse impacts of storm tide inundation”. The relative frequency, magnitude and risk of these events should be considered.

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion should be addressed in Section 4.1. The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management) should be addressed in Section 4.4 with regard to contamination of waterways and in Section 4.7 with regard to the design of waste containment systems. The impacts of winds, rain, humidity and temperature inversions on air quality should be addressed in Section 4.6.

4.4 Water resources

4.4.1 Description of environmental values

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 EP Act, Environmental Protection (Water) Policy 1997 (EPP (Water)), ANZECC 2000 and the South East Queensland Water Quality Management Strategy.

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.

4.4.1.1 Surface waterways

A description should be given of the surface waters and their quality and quantity in the area affected by the Proposal with an outline of the significance of these waters to the system in which they occur (NB impacts on coastal water quality should be discussed in Section 4.4 (Coastal environment)). Details provided should include a description of existing surface drainage patterns, flows in major streams and wetlands. Also 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 exceedence probabilities for affected waterways, where data permits.

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

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the Proposal and the extent of any such impacts. The basis for this assessment should be a monitoring program, with sampling stations located upstream and downstream of the Proposal. Stream-flow estimates must be based on Australian Standards for calculating stream flow and runoff.

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

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

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

4.4.1.2 Groundwater

The EIS should review the quality, quantity and significance of groundwater in the Proposal area, together with groundwater use in neighbouring areas.

The review should include a survey of existing groundwater supply facilities (bores, wells, or excavations) to the extent of any environmental harm. The information to be gathered for analysis is to include:

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

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

This section should include reference to:

- nature of the aquifer/s

  - geology/stratigraphy - such as alluvium, volcanic, metamorphic;
  - aquifer type - such as confined, unconfined; and
  - depth to and thickness of the aquifers.

- hydrology of the aquifer/s

  - depth to water level and seasonal changes in levels;
  - groundwater flow directions (defined from water level contours);
  - interaction with surface water;
  - interaction with sea/salt water;
  - possible sources of recharge; and
  - vulnerability to pollution.

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

Describe the environmental values of the underground waters of the affected area in terms of:

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

4.4.2 Potential impacts and mitigation measures

This section is to assess potential impacts on water resource environmental values identified in the previous section. It will also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

The EIS should describe the possible environmental harm caused by the proposed project to environmental values for water as expressed in the EPP (water).

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 during works, 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, operation and decommissioning of the Proposal.

Key water management strategy objectives include:

- protection of the integrity of the marine environment, and ultimately the Great Barrier Reef Marine Park and World Heritage property;
- protection of important local aquifers and protection of their waters;
- maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota and the littoral zone);

and

- minimisation of impacts on flooding levels and frequencies both upstream and downstream of the Proposal.

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

4.4.2.1 Surface water and water courses

The potential environmental harm to the flow and the quality of surface waters from all phases of the Proposal should be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian area, wetland, estuary, littoral zone, and any marine and in-stream biological uses. The impacts of surface water flow on existing infrastructure should be considered. Refer to the EPP (Water) and *Water Act 2000*.

The hydrological impacts of the Proposal should be assessed, particularly with regard to stream diversions, scouring and erosion, and changes to flooding levels and frequencies both upstream and downstream of the Proposal. When flooding levels will be affected, modelling of afflux should be provided and illustrated with maps. Assessment of impacts on the flow and the quality of surface waters and effects on ecosystems should include an assessment of the likely effects on mangrove and other estuarine habitats as a result of any temporary diversion of existing water courses.

Quality characteristics discussed should be those appropriate to the downstream and upstream water uses that may be affected. Chemical and physical properties of any waste water (including concentrations of constituents) at the point of entering natural surface waters should be discussed along with toxicity of effluent constituents to flora and fauna.

Reference should be made to the properties of the land disturbed and the technology for settling suspended clays from contaminated water, and the techniques to be employed to ensure that contaminated water is contained and successfully treated on the site.

In relation to water supply and usage, and wastewater disposal, the EIS should discuss anticipated flows of water to and from the Proposal area. Where dams, weirs or ponds are proposed, the EIS should investigate the effects of predictable climatic extremes (storm events, floods and droughts) on: the capacity of the dams to retain contaminants; the structural integrity of the containing walls; and the quality of water contained, and flows and quality of water discharged. The design of all water storage facilities should follow the technical guidelines on site water management.

The need or otherwise for licensing of any dams or creek diversions, under the *Water Act 2000* should be discussed. Water allocation and water sources should be established in consultation with NR&W.

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

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 and the EPP (Water) should be used as a reference for evaluating the effects of various levels of contamination.

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

Where it is proposed that creeks be diverted, the EIS should 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 should 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.

4.4.2.2 Groundwater

The EIS should include an assessment of the potential environmental harm caused by the Proposal to local groundwater resources.

The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the Proposal to groundwater depletion or recharge, and propose management options available to monitor and mitigate these effects. The response of the groundwater resource to the progression and finally cessation of the Proposal should be described.

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

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

4.5 Coastal environment

4.5.1 Description of environmental values

This section describes the existing coastal environment, which may be affected by the Proposal in the context of coastal values identified in State Coastal Management Plan and draft Mackay-Whitsunday Regional Coastal Management Plan and environmental values as defined by the EP Act and environmental protection policies. The EPP (Water) has a set of default environmental values for waterways that include aquatic ecosystem protection.

This section should also identify actions associated with the Proposal that are assessable development within the coastal zone and will require assessment under the provisions of the CMP Act.

4.5.1.1 Water quality

Provide baseline information on water quality in the sea and in estuaries below the limit of tidal influence, including heavy metals, acidity, turbidity and oil in water.

Provide a comprehensive discussion of physical factors affecting marine water quality in the area including tides, cyclones, sea level rise, winds and waves. This should include a description of the hydrology and hydraulics of the area of the proposal in terms of current velocities and directions at different tidal states, tide heights, sediment transport patterns, siltation patterns, water depth and prevailing wind/wave directions and heights. At least two-dimensional modelling should be undertaken for the determination of impacts to Shute Bay and the Great Barrier Reef lagoon.

Discuss in detail the dominant ecological processes, including nutrient and organic matter cycling and the key limiting physical factors to the ecological processes. Discuss the interaction of freshwater flows with marine waters its significance in relation to marine flora and fauna adjacent to the Proposal area.

Provide an assessment of the existing water quality of Shute Bay, including any seasonal variations that occur, through either monitoring or using recent available published data. The assessment is to include parameters such as but not limited to total and dissolved organic carbon, pH, dissolved oxygen, suspended solids, turbidity, total nitrogen, total phosphorous, dissolved inorganic nitrogen and phosphorous species, total and dissolved aluminium, total and dissolved iron, faecal coliforms, and chlorophyll a. Sufficient baseline water quality information is required to be collected in consultation with the EPA and the Great Barrier Reef Marine Park Authority to define the natural variation of parameters to set marine water quality objectives, and to set limits on contaminants in water discharged from the construction site. The process of establishing the water quality objectives should be in accordance with the ANZECC guidelines (2000), and a description of how the baseline data sets compare with the ANZECC guidelines must be provided.

Describe the environmental values of the coastal seas of the affected area in terms of:

- values identified in the EPP (Water);

- Queensland Water Quality Guidelines 2006; and
- the State Coastal Management Plan and Mackay-Whitsunday Regional Coastal Management Plan (draft or final).

Define and describe the water quality objectives required to protect the environmental values identified, including why they are suitable indicators for the environmental values (protocols must be consistent with the EPP (Water). Specific details should be provided on how the water quality objectives have been derived for the dredging/reclamation activities.

4.5.1.2 Coastal processes

Provide an assessment of physical and chemical characteristics of sediments within the littoral and marine zone adjacent to the Proposal area.

Provide a comprehensive discussion of physical factors and processes affecting coastal processes in the area including currents, tides, storm tides, cyclones, sea level rise, winds and waves. This should include a description and quantification of the hydrology and hydrodynamics of the area of the proposal in terms of current velocities and directions at different tidal states, tide heights, sediment transport patterns, sediment transport rates, siltation patterns, water depth and prevailing wind/wave directions and heights and their interaction in relation to the transport of materials within and adjacent to the Proposal area including the head of Shute Bay. Extreme events should be assessed in terms of wave conditions, currents, sediment transport processes (including erosion and accretion patterns), and storm tide levels. At least two-dimensional modelling should be undertaken for the determination of impacts to Shute Bay and the Great Barrier Reef lagoon. Any modelling undertaken will require calibration and verification using appropriate data collected in the area of interest, including water levels and currents. Sensitivity testing of model output to a range of key input parameters must be provided.

Describe the environmental values of the coastal resources of the affected area in terms of the physical integrity and morphology of landforms created or modified by coastal processes.

4.5.2 Potential impacts and mitigation measures

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

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

Assess the impact of construction activities and the final development on marine waters including hydrodynamics (waves, water levels and currents) and water quality objectives of Shute Bay. This should also report on the effect, if any, that the development will have on longshore sediment transport and geomorphology at the site or on the adjacent coastline (specifically the remainder of Shute Bay). The assumptions, calibration, validation and related uncertainty of model predictions must be provided.

Describe mitigation measures associated with storm tide events, particularly evacuation measures.

The potential environmental harm caused by the Proposal on coastal resources and processes should be described in the context of controlling such effects. The State Planning Policy – Planning and Managing Development involving ASS 2002, the State Coastal Management Plan 2001, Mackay-Whitsunday Regional Coastal Management Plan (draft or final) and Department of Primary Industries and Fisheries Guidelines for Marine Areas should be addressed.

Provide detailed information on:

- how the proposed treatment methods outlined in the ASS management plan (see section 4.1.2.2) will minimise impacts to the receiving coastal areas;
- proposed management of stormwater from on site and off site during construction;

- the extent of the sediment plume (describe and quantify) from reclamation and dredging (construction and maintenance) works;
- proposed management of the sediment plume from reclamation works, capital and maintenance dredging including deployment, design and effectiveness of 'silt curtain' systems (or other proposed management devices) under all operating conditions;
- provide and review relevant research information to demonstrate that the proposed management structures (eg. silt curtains alone) will be effective in controlling turbidity levels and fluid mud movement;
- proposed management of the quality of the discharge water throughout the entire dredging and reclamation works, and for future maintenance dredging, including:

    - retention time required to achieve discharge water quality requirements for dredge spoil and contaminated waters;
    - designed retention period prior to discharge (available storage capacity) at all stages, including provision for high intensity rainfall events and sea water intrusion by wave action;
    - design of settling ponds to prevent leakage, resuspension, or short-circuiting of flow;

- expected siltation rates (describe and quantify) in the marina and access channel;
- provision for, and maintenance of, the integrity of the maintenance dredge spoil rehandling area;
- effect of the reclaimed finger of land on coastal processes, including sediment transport patterns, longshore sediment transport/deposition rates and erosion rates down drift of the structure including a discussion of alternative design layouts of the reclamation areas to minimise impact on coastal processes;
- management of storm tide and sea level rise impacts, including storm tide and wave action on the reclamation area during construction;
- management of potential mud displacement associated with the reclamation works; and
- monitoring, reporting, and corrective action/contingency plans to prevent exceedance of discharge and marine water quality limits.

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

4.6 Air

4.6.1 Description of environmental values

This section describes the existing air environment that may be affected by the Proposal. The following topics may be addressed (note - the topics are not an exhaustive treatment of all possible air impacts).

A description of the existing air shed environment should be provided having regard for particulates and gaseous and odorous compounds. The background levels and sources of suspended particulates and any other major constituent of the air environment that may be affected by the Proposal should be discussed.

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

4.6.1.1 Greenhouse gas emissions

This section of the EIS should:

- provide an inventory of projected annual emissions for each relevant greenhouse gas from construction equipment and plant, with total emissions expressed in 'CO2 equivalent' terms;
- estimate emissions from upstream activities associated with the proposed project, including fossil fuel based electricity consumed; and
- briefly describe method(s) by which estimates were made.

The Australian Greenhouse Office Factors and Methods Workbook (available via the internet) can be used as a

reference source for emission estimates and supplemented by other sources where practicable and appropriate.

4.6.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values for air, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed. Information should be submitted on the use of new technologies to reduce air emissions from sources.

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

The proposed levels of emissions should be compared with the national environmental protection measures for ambient air quality (1998), the National Health Medical Research Council national guidelines (1985) for control of emissions from stationary sources, and the Environmental Protection (Air) Policy 1997 (EPP (Air)).

Where appropriate, the predicted average ground level concentrations in nearby areas should be provided. These predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary. Ground level predictions should be made at any residential, industrial and agricultural developments believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained. The assessment of the Proposal's impact on air quality should include at least the following matters:

- The human health risk associated with emissions from the facility of all hazardous or toxic pollutants should be assessed whether they are or are not covered by the National Environmental Protection Council (Ambient Air Quality) Measure or the EPP (Air).
- Detail the features of the Proposal designed to suppress or minimise emissions, including dusts and odours.
- The assessment of proposed levels of emissions of dust, fumes and odours should include emissions during both normal and disturbed conditions. Consideration should be given to the range of potential disturbed condition scenarios and the air emissions that may be generated as a result.
- Where there is no single atmospheric dispersion model that is able to handle the different atmospheric dispersion characteristics exhibited in the Proposal area (e.g. sea breezes, strong convection, terrain features, temperature inversions and pollutant re-circulation), a combination of acceptable models will need to be applied.
- The limitations and accuracy of the applied atmospheric dispersion models should be discussed. The air quality modelling results should be discussed in light of the limitations and accuracy of the applied models.
- Air quality predictions should be compared to the relevant goals in the National Environmental Protection Council (Ambient Air Quality) Measure and the EPP (Air) goals.

4.6.2.1 Greenhouse gas abatement

This section of the EIS should propose and assess greenhouse gas abatement measures. It should include:

- a description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from activities of the Proposal;
- 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; and
- a description of any opportunities for further offsetting greenhouse gas emissions through indirect means.

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);
- integrating transport for the Proposal with other local industries such that greenhouse gas emissions from the proposal are minimised; and
- maximising the use of renewable energy sources.

The EM 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 Proposal with details of the intended objectives, measures and performance standards to avoid, minimise and control emissions;
- commitments to energy management;
- opportunities for offsetting greenhouse emissions, including, renewable energy uses; and
- commitments to monitor and report on the success of greenhouse gas offset measures.

4.6.2.2 Climate change adaptation

Climate change, through alterations to weather patterns and rising sea level, has the potential to impact in the future on developments designed now. Most developments involve the transfer to, or use by, a proponent of a community resource in one form or another, such as the granting of a non-renewable resource or the approval to discharge pollutants to air, water or land. Therefore, it is important that the EIS specifies how the Proposal design is adaptive to climate change so that community resources are not depreciated by projects that would be abandoned or require costly modification before their potential to provide a full return to the community is realised. Consequently, the EIS should provide an assessment of the Proposal's vulnerabilities to climate change and describe possible adaptation strategies 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 Proposal;
- 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, and that a balance must be found between the costs of preparing for climate change and the uncertainty of outcomes. However, proponents should use their best efforts to incorporate and demonstrate adaptation to climate change in their EIS and project design.

4.7 Waste

This section should 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 on the relevant environmental values. The purpose of this format is to concentrate the technical information on waste management (including waste minimisation, re-use and recycling) into one section in order to facilitate its transfer into the EM Plan.

4.7.1 Description of environmental values

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

4.7.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values 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.

This section should assess the potential impact of all wastes to be generated in construction and operation 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 (including marine sewage) and solid wastes;
- the potential level of impact on environmental values;
- proposed discharge/disposal criteria for liquid and solid wastes;
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or dredge spoil should be given;
- market demand for recyclable waste (where appropriate) should be addressed; and
- waste minimisation, re-use and recycling techniques processes proposed.

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

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

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

4.8 Noise and vibration

4.8.1 Description of environmental values

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

If the proposed activity could adversely impact on the noise environment, baseline monitoring should be undertaken at a selection of sensitive sites affected by the Proposal in consultation with the EPA. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997 (EPP (Noise). The locations of sensitive sites should be identified on a map at a suitable scale. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the Proposal should be described.

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

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

4.8.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values 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 should include matters raised in the document The health effects of environmental noise – other than hearing loss published by the enHealth Council, 2004 (or later editions), ISNB 0 642 82304 9.

Information, including mapped noise contours from a suitable acoustic model, should be submitted based on the proposed generation of noise. The potential environmental harm of noise and vibration from the use of machinery for pile driving or mechanical rock breaking, blasting or general use of heavy machinery at all potentially sensitive places and the proposed hours of operation, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. Particular consideration should be given to emissions of low-frequency noise; that is, noise with components below 200Hz. The assessment should also include environmental impacts on terrestrial and marine animals and avifauna, particularly migratory species. Proposed measures for the minimisation or elimination of impacts should be provided, including details and illustrations of any screening, lining, enclosing or bunding. A discussion should be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise.

Information should be supplied on blasting which might cause ground vibration or fly rock on or adjacent to, the site with particular attention given to places of work, residence, recreation, worship general amenity and fauna, particularly migratory marine fauna. The magnitude, duration and frequency of any vibration should be addressed. An assessment should be provided of measures to prevent or minimise environmental nuisance and harm, both during construction and the subsequent operation of the site. Blasting noise and vibration limits are provided in section 61 of the Environmental Protection Regulation 1998. Reference should also be made to the EPA Guideline: Noise and vibration from blasting.

The assessment should also address off-site noise and vibration impacts that could arise due to increased road transportation directly resulting from the Proposal. A noise report completed by a suitably qualified noise consultant must be and carried out in accordance with Main Roads' Road Traffic Noise Management: Code of Practice (January 2000).

4.9 Nature conservation

4.9.1 Description of environmental values

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

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

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

The description should include lists of key species in each ecosystem/habitat and any species listed as rare or threatened under the *Nature Conservation Act 1992* (NC Act) or the EPBC Act, taking into account seasonal variation in each community. The occurrence of pest plants and animals in the Proposal area should be described. Descriptions should be supported by mapping at a suitable scale and should identify any areas of national, state or regional significance.

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 current 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 produced by the EPA (e.g. see the Regional Nature Conservation Strategy for SE Qld 2003-2008).

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, 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. Project 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):

- habitats of species listed as rare or threatened under the NC Act and/or listed under the Commonwealth EPBC Act;
- regional ecosystems (RE) listed as endangered or of concern under State legislation, and/or ecosystems listed under the Commonwealth EPBC Act;
- good representative examples of remnant RE or RE 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 2004* 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*.

4.9.1.1 Flora

For terrestrial and marine vegetation, a map at a suitable scale should be provided, with descriptions of the units mapped. RE should be described and mapped, including identification of the conservation status under the *Vegetation Management Act 1999* and biodiversity conservation status assigned by the EPA. 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 with consideration given to identify weed species and potential for establishment of weeds arising form the importation of fill.

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 (i.e. 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 RE type descriptions in accordance with the Regional Ecosystem Description Database available at the EPA's website;
- location of vegetation types of conservation significance based on EPA's RE types and occurrence of species listed as protected plants under the Nature Conservation (Wildlife) Regulation 1994 and subsequent amendments, as well as areas subject to the *Vegetation Management Act 1999*;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges);
- 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.

4.9.1.2 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 rare or threatened species that is suspected (but not confirmed) to occur on the site;
- 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.

4.9.1.3 Aquatic biology

General

The aquatic flora and fauna occurring in the areas affected by the Proposal should be described from recent biota surveys/studies, 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 waters within and adjoining the affected area, and/or those in any associated lacustrine and marine environment;
- any rare or threatened marine species, particularly dugong, marine turtles and their habitats;
- aquatic plants, cyanobacterium (eg. Lyngbya sp.) and marine algae;
- aquatic and benthic habitats; and
- habitat downstream of the Proposal or potentially impacted due to currents in associated lacustrine and marine environments.

Fisheries

Provide a specific section that details the commercial, recreational and indigenous fishing activities in the the Shute Harbour and environs area that have the potential to be impacted. Specific points to include:

- nature and extent of fish habitats, including seagrass (permanent and ephemeral seagrass meadows), macro-algae, mangrove and saltcouch communities and sand bars/mudflats, mapped relative to existing natural features for reference;
- types and spatial distribution of economically important fish species, including their migration requirements;
- nature, timing and spatial distribution of the respective fishing sectors;
- the immediate and longer term impacts on existing fish habitats, fish populations, migrations and sectoral fishing activities;
- any benefits to the fishing sectors; and
- measures to be employed to minimise the impacts on fisheries resources in and adjacent to the proposed development footprint both during and post construction.

Detail the potential environmental harm in the short term to flora and fauna communities from the direct effects of dredging. This should include modelling of the potential effects of the dredge plume (eg. increased turbidity) and re-suspension and seabed movement of dredge derived sediment on seagrass and other aquatic species within and adjacent to the proposed marina area.

Any offsets (mitigation) for impacts on fish habitats, fish and fisheries activities needs to be identified and quantified with regard to government policies, including the Department of Primary industries and Fisheries policy "Mitigation and compensation for activities causing marine fish habitat loss."

4.9.2 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 Proposal or likely impacts that require an authority under the *Nature Conservation Act 1992,* and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*, CMP Act or *Fisheries Act 1994*.

The EIS should cover all direct, indirect and cumulative environmental harm to flora and fauna that has the potential to result from the Proposal. Specific emphasis should be paid to environmentally sensitive areas and species that have local, state, national and international significance such as species listed under the Nature

Conservation (Wildlife) Regulations 1994 (Qld) as Rare, Vulnerable or Endangered and species listed under the EPBC Act. These should include, but not be limited to:

- *Leucopogon cuspidatus, Macropteranthes fitzalanii, Rourea brachyandra, Actephila sessilifolia, Rhodamnia glabrescens, Medicosma obovate, Atalaya rigida, Brachychiton compactus, and Solanum sporadotrichum*;
- Water Mouse (*Xeromys myoides*);
- Proserpine Rock-wallaby (*Petrogale persephone*);
- Rufous owl (southern subspecies) (*Ninox rufa queenslandica*)
- Loggerhead Turtle (*Caretta caretta*);
- Green Turtle (*Chelonia mydas*);
- Leatherback Turtle (*Dermochelys coriacea*);
- Hawksbill Turtle (*Eretmochelys imbricata*);
- Flatback Turtle (*Natator depressus*); and
- Dugong (*Dugong dugon*).

The potential environmental harm on flora and fauna due to any alterations to the long term hydrodynamic processes of adjacent coastal environments should be discussed with specific reference to environmental impacts on riparian vegetation or other sensitive vegetation communities including mangrove stands and seagrass meadows. 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 potential for invasion of pest species via ballast water and hull fouling should be addressed.

Detailed information should be provided in relation prevention of direct impacts on marine fauna by the dredging operation including:

- dredge head design to physically exclude and deter turtles;
- dredging method (eg. pneumatic / cutter suction);
- operational constraints and monitoring systems to minimise risks to turtles or dugong; and
- monitoring and reporting of harm and subsequent review of operations.

Describe the impact of the creation of permanent deep water within the marina and the likely colonisation of the marina and marine structures with marine biota, which may partially offset the adverse impacts of the development on marine biodiversity.

Assess impacts on marine park values through increased marine traffic and visitation.

Report on the potential impacts of increased road traffic (effects of increased traffic volume, noise and light) associated with the construction and operational phases of the development on the Proserpine Rock-wallaby (Petrogale persephone), particularly along Proserpine Shute Harbour Road and mitigation measures that will be implemented to minimise any adverse impacts.

Report on the potential human impacts and the proposed control methods of any domestic animals introduced to the area.

Strategies for protecting the Great Barrier Reef Marine Park and World Heritage Property, and 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 and mitigation methods to reduce the impacts on turtles and dugongs related to increased recreational and commercial use (i.e. boat strike, degraded water quality and habitat/food source losses).

An assessment of the potential impacts of altered lighting and noise environments on terrestrial and marine fauna, including a discussion of measures to reduce such impact should be undertaken

An assessment on the extent of direct and potential long term remnant vegetation degradation/ loss, including a description of its vegetation management and biodiversity conservation status should be performed.

The potential environmental harm to the ecological values of the area arising from the construction and operation of the Proposal 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 describe and justified.

Strategies for collecting and preserving any significant fossils 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.

Management strategies are required for existing exotic flora and fauna species, minimising the risk of introducing new exotic species, and monitoring for and managing any such introductions.

Feral animal (eg. dogs and cats) management strategies and practices should also be addressed. The EIS should outline 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 Proposal.

4.10 Cultural heritage

4.10.1 Description of environmental values

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

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

4.10.1.1 Indigenous Cultural Heritage

An Indigenous cultural heritage study is a specific process under the *Aboriginal Cultural Heritage Act 2003* (ACH Act) 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 ACH Act, to the Chief Executive of NR&W, Whitsunday Shire Council (only if owner or occupier of the subject land), and the registered Native Title Claimants, who are the Aboriginal Parties under the ACH Act;
- 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, NR&W, 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.

4.10.1.2 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 should 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;
- consultation regarding non-indigenous cultural heritage values within the study area with relevant community groups, eg historical society, museum organisation, and conservation groups;
- 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.

4.10.2Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing cultural heritage environmental values, 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 harm to cultural heritage values in the vicinity of the Proposal should be managed under a CHMP developed specifically for the Proposal. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the Proposal 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 should 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 Proposal areas, including associated infrastructure developments, both during the construction and operational phases of the Proposal;
- 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 should be negotiated between the relevant parties i.e. the Proposal 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.

Some aspects of the above matters can be referred to the Land and Resources Tribunal. The Land and Resources Tribunal can provide mediation assistance in the course of developing a CHMP or make a recommendation of the suitability of the CHMP if the parties cannot reach agreement.

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

4.11 Social

4.11.1 Description of environmental values

This section describes the existing social values that may be affected by the Proposal.

The social amenity, potential disruption to the amenity and use (including during construction) of the Proposal area and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential or access purposes (including at Airlie Beach) should be described. Consideration should be given to:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community;
- local community values, vitality and lifestyles;
- public access to foreshores and adjacent marine environment;
- potential cost to the public of alternative public access arrangement emanating as a result of the proposal;
- recreational, 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 Proposal; and
- number of families affected by the Proposal, this should include not only property owners but also families of workers either living adjacent the site or workers where the area is their primary employment.

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, marine operations and infrastructure.

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 4.9 Cultural Heritage and Section 4.12 Economy.

4.11.2 Potential impacts and mitigation measures

This section defines and describes 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 Proposal should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the Proposal's impact, both beneficial and adverse, on the region and local community. The impacts of the Proposal on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages (including construction and operational phases) 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 should include sufficient data to enable State authorities, such as Queensland Health and Education Queensland, to plan for the continuing provision of public services in the region of the Proposal. Proponents of projects that are likely to result in a significant increase in population of an area should consult the relevant management units of the State authorities, and summarise the results of the consultations in the EIS. The summary should discuss how the impacts of population increase on public services, particularly health and eduction, would be mitigated.

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

The EIS should address the following matters:

- include an assessment of impacts on foreshore and marine access for the general public;
- include an assessment of impacts on local residents, current land uses and existing lifestyles and enterprises;
- include 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 and establish mitigation strategies for 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 and transport, to meet any additional demands created by the Proposal is to be discussed;
- an assessment of impacts on relevant demographic, social, cultural and economic profiles and transport;
- identify any new skills and training to be introduced in relation to the Proposal. Adequate provision should be made for apprenticeship and worker training schemes. If possible, the occupational skill groups required and potential skill shortages anticipated should be indicated;
- provide comment on how much service revenue and work from the Proposal (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the Proposal;
- include an assessment of impacts on existing local residents' values and aspirations; and
- in regard to affected indigenous and non-indigenous communities respectively, particular attention should 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 Proposal on local and regional residents, including land acquisition, property access and relocation issues and property valuation and marketability, community services and recreational activities.

Discuss the potential environmental harm on the amenity of adjacent areas used for cropping, grazing, forestry, recreation, industry, education, aesthetics, or scientific or residential purposes. Describe the implications of the Proposal 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 should also be recommended.

4.12 Health and safety

4.12.1 Description of environmental values

This section describes the existing community values for public health and safety that may be affected by the Proposal. For projects proposing air emissions, and/or those with the potential to emit odours, nearby and other potentially affected populations should be identified and described. Particular attention should be paid to those

sections of the population, such as children and the elderly, which are especially sensitive to environmental health factors.

4.12.2Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing health and safety community 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 EIS should assess the effects on the Proposal workforce of occupational health and safety risks and the impacts on the community in terms of health, safety, and quality of life from project operations and emissions. Any impacts on the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety, quality of life from factors such as air emissions, odour, dust and noise.

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

The EIS should address the Proposal's potential for providing disease vectors. Measures to control mosquito and biting midge breeding should be described. Any use of recycled water should be assessed for its potential to cause infection by the transmission of bacteria and/or viruses by contact, dispersion of aerosols, and ingestion (e.g. via use on food crops). Similarly, the use of recycled water should be assessed for its potential to cause harm to health via the food chain due to contaminants such as heavy metals and persistent organic chemicals. Practical monitoring regimes should also be recommended in this section.

4.13 Economy

4.13.1Description of environmental values

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

- economic viability (including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular drought and rural downturn etc);
- existing local commercial activities which may be directly or indirectly affected by the development;
- demand for commercial and public services/facilities at Shute Harbour that may arise as a result of the development; and
- historical descriptions of large-scale resource developments and their effects in the region.

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

4.13.2Potential 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, 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.

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

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

- the significance of this project on the local and regional economic context;
- the long and short-term beneficial (eg. job creation) and adverse impacts (eg. competition with local small business, impacts on navigation, and maintenance of marine access) that are likely to result from the development;
- the potential, if any, for direct equity investment in the Proposal 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);
- impacts of the proposal on adjoining sites and activities and the outcomes of any applicable land use study;
- impact on the economic diversity of the area;
- the potential economic impact of any major hazard identified in section 4.13;
- the distributional effects of the Proposal including projects to mitigate any negative impact on disadvantaged groups;
- the value of lost opportunities or gained opportunities for other economic activities anticipated in the future; and
- impacts on local property values.

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

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

4.14 Hazard and risk

4.14.1Description of environmental values

This section describes the potential hazards and risk that may be associated with the Proposal.

Detail the environmental values likely to be affected by any hazardous materials and actions incorporated in the Proposal. The degree and sensitivity of risk should 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 Proposal on sensitive areas and resources such as forests, water reserves, State and local Government controlled roads, places of residence and work, and recreational areas.

4.14.2Potential 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 should provide an inventory for each class of substances listed in the Australian Dangerous Goods Codes to be held on-site. This information should be presented by classes and should contain:

- chemical name;
- concentration in raw material chemicals;
- concentration in operation storage tank;
- U.N. number;
- packaging group;
- correct shipping name; and
- maximum inventory of each substance.

Details should be provided 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;
- the risk to the environment from a storm event (1% Annual Exceedence Probability) if the development stops or is halted at vulnerable stages of construction of the project, identified in consultation with the EPA; and
- the procedures to prevent spillages, and the emergency plans to manage hazardous situations.

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

- all relevant majors hazards both technological and natural, including earthquakes, cyclones and tidal surges;
- 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; and
- description of processes, type of the machinery and equipment used;
- potential wildlife hazards such as crocodiles, snakes, and disease vectors; and
- public liability of the State for private infrastructure and visitors on public land.

The plan should 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 should be prepared in accordance with the relevant NSW DUAP Hazardous Industry Planning Advisory Paper.

4.15 Cross-reference with the terms of reference

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

5 ENVIRONMENTAL MANAGEMENT PLAN

The EM Plan should be developed from the mitigation measures detailed in part 4 of the EIS. Its purpose is to set out the proponents' commitments to environmental management. That is, how environmental values will be protected and enhanced. Separate EM Plans should address discrete Project elements and should provide life-of-proposal control strategies in accordance with agreed performance criteria for specified acceptable levels of environmental harm. For example, a road impact and traffic management plan must be prepared and placed in the relevant section(s) of the EM Plan.

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

The aims of an EM Plan are to provide:

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

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

- environmental protection objectives for enhancing or protecting each relevant value;
- indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved;
- environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective; and
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:

    - continuous improvement;
    - environmental auditing;
    - monitoring;
    - reporting;
    - staff training; and
    - a decommissioning 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 “Preparing Environmental Management Plans” and its recommended structure for EM Plans. While this EPA guideline has been developed primarily for the mining industry, the principles are applicable to this proposal. The general contents of the EM Plan should comprise:

- the proponents’ commitments to acceptable levels of environmental performance, including environmental objectives, i.e. levels of expected environmental harm, 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. The EM Plan(s) should provide sufficient detailed information for Advisory Agencies to make recommendations relevant to the level of Development Approvals for which the EIS relates to.

6 CONCLUSIONS AND RECOMMENDATIONS

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

7 REFERENCES

All references consulted should be presented in the EIS in a recognised format such as the Harvard standard

(refer to the Style Guide, Australian Government Publishing service). This standard lists references by presenting in the following order: author (date of publication) title, publisher, and place of publication.

RECOMMENDED APPENDICES

A1. Final terms of reference for this EIS

A copy of the final ToR should 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 should 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, should also be provided in Section 4.14 of the EIS. For this purpose the ToR should be line numbered.

A2. Statutory approvals

A list of all the approvals required by all phases of the Proposal should be presented (in the expected sequencing of applications) along with their corresponding regulating legislation and the approving authority.

A3. Potential impacts on matters of national environmental significance

The EIS should provide a stand-alone report that exclusively and fully addresses the issues relevant to the matters of NES that were identified in the 'controlling provisions' when the Proposal was declared a controlled action under Part 3, Division 1 of the EPBC Act. The stand-alone report should follow the following template outline.

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

The description and analysis of the potential impacts of the proposal must address all aspects of the proposal. For example, the proposal appears to require a substantial amount of material to assist with the proposed land reclamation. The report must address the potential impacts on the nominated controlling provisions of:

- the excavation and/or dredging of such material from its current location; and
- the transport of such material to the development site.

All discussion of the potential impacts of the proposal must address both potential direct and indirect impacts. The stand-alone report must discuss:

- the World Heritage values in the vicinity of the proposed development and associated activities;
- the presence and environmental requirements of any species of flora or fauna or ecological community, listed as threatened under the EPBC Act, potentially impacted by the proposed development;
- the presence and environmental requirements of any migratory species listed under the EPBC Act potentially impacted by the proposed development;
- the environment of the Commonwealth marine area potentially affected by the proposed development; and
- the potential impacts of the proposal on all of the above matters.

With regard to World Heritage Values, the stand alone report should include:

- identification of all World Heritage values with potential to be affected by the proposed action including: the high scenic value of Shute Harbour, algae, ascidians, birds, bryozoans, butterflies, crustaceans, echinoderms, fishes, flatworms, fringing reefs, geological and geomorphological

aspects, hard corals, mangroves, marine mammals, marine turtles, molluscs, octocorals, phytoplanktons, polychaete worms, seagrasses, soft bottom habitats, sponges and terrestrial flora; and
- identification and evaluation of potential direct and indirect impacts to these values during all phases of the proposed action.

Listed threatened species and communities that may be impacted by the proposed development include (and any additional threatened species listed under the EPBC Act and not listed below which may be impacted by the proposal):

- Loggerhead Turtle (*Caretta caretta*);
- Green Turtle (*Chelonia mydas*);
- Leatherback Turtle (*Dermochelys coriacea*);
- Hawksbill Turtle (*Eretmochelys imbricata*);
- Flatback Turtle (*Natator depressus*); and
- Water Mouse (*Xeromys myoides*).

A4. Study team

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

A5. Consultation report

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

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

The Consultation Report appendix should 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 should 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.

A6. Research

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

A7. Specialist studies

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

- geology;
- soil survey and land suitability studies;
- surface water hydrology and quality;
- groundwater;
- flora and fauna studies;
- economic studies,
- coastal processes, and
- hazard and risk studies.

(Also include other studies referred to, such as the Whitsunday Region Marina Demand Analysis 2001).

A8. List of Proponent Commitments

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