Appendix 1

Guidelines for preparation of a draft environmental impact statement: Ichthys Gas Field Development Project

Northern Territory Government

DEPARTMENT OF
NATURAL RESOURCES, ENVIRONMENT, THE ARTS AND SPORT

Guidelines for Preparation of a Draft Environmental Impact Statement

ICHTHYS GAS FIELD DEVELOPMENT PROJECT

BLAYDIN POINT, DARWIN, NT

- INPEX BROWSE LTD -

September 2008

Australian Government

Department of the Environment, Water, Heritage and the Arts

TABLE OF CONTENTS

1 Introduction

INPEX Browse Ltd (INPEX) proposes to develop the Ichthys Field in the Browse Basin off the north-west coast of Australia to produce liquefied natural gas (LNG), liquefied petroleum gas (LPG) and condensate. The proposal includes the installation and operation of offshore extraction and processing facilities in the Ichthys Field, an onshore liquefaction (LNG) and fractionation (LPG) facility at Blaydin Point, Darwin, and an 850-935km pipeline to transport the gas from the offshore facilities to the onshore facilities.

The Northern Territory Minister for Natural Resources, Environment and Heritage (NT Minister) has determined that this proposal requires formal assessment, under the NT *Environmental Assessment Act 1982* (EA Act), at the level of an Environmental Impact Statement (EIS). Issues of concern contributing to this decision include:

- Visual amenity and public interest;
- Dredging impacts;
- Potential for disturbance to marine and terrestrial biodiversity;
- Potential for maritime heritage disturbance;
- Increased shipping movements in the Port of Darwin;
- Construction of new wharf facilities and associated impacts;
- Processing wastewater discharge to Darwin Harbour; and
- Air emissions including greenhouse gases.

The proposal was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 9 May 2008. A delegate for the Commonwealth Minister for the Environment, Heritage and the Arts (Cmth Minister) determined on 10 June 2008 that assessment is required under the EPBC Act, and on 16 July 2008 it was decided that the proposal will be assessed at the level of an EIS.

The proposed action has the potential to have a significant impact on the following matters of National Environmental Significance (NES) that are protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (section 18 and 18A);
- Listed migratory species (sections 20 and 20A); and
- Commonwealth marine environment (sections 23 and 24A).

These guidelines have been developed to assist INPEX in preparing an EIS for the Ichthys Gas Field Development Project, in accordance with Clause 8 of the Environmental Assessment Administrative Procedures of the EA Act of the Northern Territory, and to meet the requirements as provided for in Chapter 4 Division 6 of the EPBC Act of the Australian Government.

Information about the action and its relevant impacts, as outlined in this document, is to be provided in the EIS. This information must be sufficient to allow:

- The Cmth Minister to make an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision; and
- The NT Minister to make informed recommendations to the responsible (consent) Minister in accordance with the EA Act.

Responsibilities within the assessment process are divided between the jurisdictions as follows:

- The Australian Government is responsible for all aspects of the offshore proposal including the majority of the pipeline route, as well as the matters of National Environmental Significance (NES) within the inshore and onshore portions of the project; and
- The Northern Territory Government is responsible for assessing the near-shore and onshore aspects of the proposal. Some assessment overlap with NES matters may occur where species are listed under both NT and Commonwealth legislation.

2 General advice on guidelines

2.1 General content

The EIS must be a stand-alone document. It must contain sufficient information to avoid the need to search out previous or supplementary reports.

The EIS must enable interested stakeholders, the NT Minister and the Cmth Minister to understand the environmental consequences of the proposed development. Information provided in the EIS must be objective, clear, and succinct and, where appropriate, be supported by maps, plans, diagrams or other descriptive detail. The body of the EIS is to be written in a clear and concise style that is easily understood by the general reader. Technical jargon should be avoided wherever possible. Cross-referencing should be used to avoid unnecessary duplication of text.

Detailed technical information, studies or investigations necessary to support the main text must be included as appendices to the EIS. Methodologies must be clearly identified and any limitations in relation to best practice stated. Any additional supporting documentation and studies, reports or literature, not normally available to the public from which information has been extracted, should be made available at appropriate locations during the period of public display of the EIS or provided by the proponent on request. The proponent should make the EIS available on the Internet.

If it is necessary to make use of material that is considered to be of a confidential nature, the proponent should consult with the Northern Territory Department of Natural Resources, Environment, the Arts and

Sport (NRETAS) and the Department of the Environment, Water, Heritage and the Arts (DEWHA) on the preferred presentation of that material, before it is submitted for approval to publish.

The level of analysis and detail in the EIS should reflect the level and complexity of the expected and potential impacts on the environment, as determined through adequate technical studies. Expected and potential impacts will be identified in Section 7 of these guidelines as a result of required investigations. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed. The extent to which the limitation, if any, of available information may influence the conclusions of the environmental assessment must also be discussed, and assessed in relation to risk and international best-practice.

The proponent must ensure that the EIS addresses the matters stated in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000 Matters to be addressed by draft public environment report and environmental impact statement* at Attachment 1.

2.2 Format and style

The EIS should comprise three elements, namely:

- The executive summary;
- The main text of the document; and
- Appendices containing detailed technical information and other information that can be made publicly available.

The structure of these guidelines may be adopted as the format for the EIS. This format need not be followed if the required information can be presented alternatively for better effect. However, each of the elements in these guidelines must be addressed to meet the requirements of the EPBC Act and Regulations and NT Government regulatory requirements.

The Executive Summary must include a brief outline of the project and each chapter of the draft EIS, allowing the reader to obtain a clear understanding of the proposed project, its environmental implications and management objectives. It must be written as a stand-alone document, able to be reproduced on request by interested parties who may not wish to read the draft EIS as a whole.

The main text of the EIS should include a list of abbreviations, a glossary of terms to define technical terms, acronyms and abbreviations, and colloquialisms.

The appendices must include:

- A copy of these guidelines;
- A list of persons and agencies consulted during the EIS;
- Contact details for the proponent;

- The names of, and work done by, the parties involved in preparing the EIS; and
- The expertise of the parties involved in work contributing to the EIS.

The EIS must be written so that any conclusions reached can be independently assessed. To this end, all sources must be appropriately referenced using the Harvard Standard. The reference list should include the address of any Internet "web" pages used as data sources. All referenced supporting documentation not normally available to the public must be available upon request.

The EIS should be produced on A4 size paper capable of being photocopied, with any maps and diagrams on A4 or A3 size and in colour if possible.

The proponent should consider the format and style of the document appropriate for publication on the Internet. The capacity of the website to store data and display the material may have some bearing on how the document is constructed.

Data collected on species listed under the EPBC Act should be provided in electronic format to DEWHA. The provision of this information will help facilitate decision-making under the EPBC Act and assist in the protection and recovery of species and communities. Details on the requirements for providing biological and mapped data are at Attachment 2.

2.3 Administration

2.3.1 Under the EA Act

Three 'preliminary' copies of the draft EIS should be lodged with the Environment, Heritage and the Arts (EHA) Division of NRETAS for internal review prior to the public review.

Once the internal review is complete and the proponent implements any necessary changes, 25 bound copies of the draft EIS should be lodged with the NT Minister care of the EHA Division for distribution to NT Government advisory bodies.

The EIS should be provided on CD/DVD in ADOBE *.pdf format for placement on the NRETAS internet site (Chapters and Appendices separate). This should be done at least 4 days before newspaper publication. Additionally, two Microsoft Word copies should be provided to facilitate production of the Assessment Report and Recommendations.

The draft EIS is to be advertised for review and comment in the *NT News*.

The EIS should be made available for public review at:

- Environment, Heritage and the Arts Division (Dept. Natural Resources, Environment, the Arts and Sport), 2nd Floor, Darwin

Plaza,
41 Smith Street Mall, Darwin;

- Development Assessment Services (Dept. Planning and Infrastructure), Information Desk, Ground Floor, Cavenagh House, Cnr Cavenagh and Knuckey Streets, Darwin;
- Minerals and Energy Information Centre, Department of Primary Industry, Fisheries and Mines, 3rd Floor, Paspalis Centrepoint, 48 Smith Street Mall, Darwin;
- Northern Territory Library (NTL), Parliament House, Darwin;
- Casuarina Public Library (e-mail citylibrary@darwin.nt.gov.au , Ph: 89300230);
- Palmerston City Library, Goyder Square, Palmerston (Contact tree.malyan@palmerston.nt.gov.au or phone 8935 9993);
- Darwin City Council Libraries (Casuarina, Darwin City, Karama, Nightcliff);
- The Environment Centre NT, Unit 3, 98 Woods St, Darwin (two copies requested with supporting documentation);
- Northern Land Council, 45 Mitchell St, Darwin;
- Larrakia Nation Governing Committee – 76 Dick Ward Drive, Coconut Grove, NT (email reception@larrakia.com; Ph: 8948 3733);
- Litchfield Shire Council office – 7 Bees Creek Road, Fred's Pass, NT (email council@lsc.nt.gov.au; Ph: 8983 1912);
- Environment Hub, Rapid Creek (Shop 9 Rapid Creek Business Village, Pearce Place, Millner);
- Katherine Town Council Public Library (telephone: 8972 5500);
- Alice Springs Town Council Public Library (telephone: 8950 0500);
- Tennant Creek Public Library (telephone: 8962 0050);
- Australian Government Department of Environment, Water, Heritage and the Arts Library, John Gorton Building, Parkes, Canberra.

Copies should also be made available to members of the Darwin Harbour Advisory Committee.

2.3.2 Under the EPBC Act

The draft EIS should be lodged with DEWHA for internal review prior to the public review. The proponent must obtain approval from the Cmth Minister before publishing the draft EIS and requesting public comment.

When the Minister's approval for publication has been granted, the proponent must publish the draft EIS and an invitation for anyone to

give the proponent comments in writing. The proponent must publish in accordance with Division 16.2 of the EPBC Regulations.

3 General information

This should provide the background and context of the action including:

- The title of the action;
- The full name and postal address of the designated proponent;
- A clear outline of the objective of the action;
- The location of the action;
- Legislative background for the proposal, including:
  - ⇒ Requirements of the EPBC Act, including under Part 3 and any other requirements and approvals needed under the EPBC Act;
  - ⇒ A description of the NES matters protected under the EPBC Act;
  - ⇒ The Northern Territory Government's approval and regulatory requirements; and
  - ⇒ Maps distinguishing the areas to which the EPBC Act applies and the EA Act applies.
- The background to the development of the action;
- How the action relates to any other proposals or actions (of which the proponent should reasonably be aware) that have been or are being taken, or that have been approved in the region affected by the action;
- The current status of the action; and
- The consequences of not proceeding with the action.

4 The Proposal

4.1 General

This section must describe the development proposal to allow a detailed understanding of infrastructure design and engineering. All construction (including site preparation), operation and management elements of the action must be described in detail. Where applicable, these details should be described separately under the appropriate headings.

Details should include the precise location of all works to be undertaken, date or time period over which construction, operation and management will take place, structures to be built, and elements of the action that may have impacts on identified environmental factors including matters protected by the EPBC Act.

This information must also include details on how the works are to be undertaken (including stages of development), and design parameters for those structural aspects of the action that have impact potential.

The following headings should be included in this section:

4.2 Objectives, benefits and justification

The EIS should contain an explanation of the objectives, benefits and justification for the project.

4.3 Project location

Describe the proposals location in its regional context using appropriately detailed maps.

4.4 Timeframes and schedules

Provide an anticipated timetable (illustrated in a timeline or Gantt chart) for the construction, operation and management of the action.

Outline any potential for expansion or additional development and possible timeframes for this.

4.5 Local planning context

Describe the relevant NT and Local Government planning schemes, local laws and any other local policies applicable to the proposal.

Identify and explain current land use, land tenure, and local and regional zoning.

Outline land requirements, acquisition requirements, and the tenures under which the project would be held including relevant legislative processes required to grant proposed tenure.

Identify any development approvals or infrastructure proposals likely to be required or affected by the proposal.

4.6 Relationship to other actions

Describe how the action relates to any other actions that have been or are being taken, or that have been approved, in the region affected by the action.

Identify any other exploration activities being undertaken or proposed in the area.

4.7 Project components and supporting infrastructure

A detailed description is required of each component of the project. For each component descriptions should include:

- Supporting infrastructure and ancillary activities such as storage areas, access roads, construction camps, waste disposal etc;
- Machinery and equipment requirements;
- Traffic and access issues and requirements;
- Any relevant site plans and layouts for each component;
- Construction methods;

- Size of the footprint area for each component or associated work area including anticipated exclusion zones required for the project and anchor placements; and
- Engineering details.

Components that should be described include:

4.7.1 Sub-sea wells

4.7.2 Offshore extraction, processing and offtake facilities

4.7.3 Offshore pipeline

4.7.4 Near-shore pipeline and shore crossing

4.7.5 Onshore pipeline

4.7.6 Dredged channel and turning basin

4.7.7 Wharf infrastructure

4.7.8 Onshore gas facility

4.8 Materials

4.8.1 Inputs

Details are required of:

- The type, source, volume and/or quantity of materials to be used;
- Transport of raw materials from source to site;
- Storage location and requirements of materials; and
- Any other anticipated inputs for the project.

4.8.2 Outputs

Details are required of:

- The type, source, volume and/or quantity of predicted waste, products and by-products generated from construction, operations and decommissioning; and
- The proposed storage, handling and disposal of any waste, products and by-products including NORMs (naturally occurring radioactive materials).

4.9 Maintenance

Identify and describe the responsible party for maintenance of the development in the long term, and maintenance programs to be developed.

4.10 Infrastructure / services

Provide a description of existing and required services and infrastructure, and any limitations on services and infrastructure such as seasonal accessibility.

4.11 Employment

Provide an estimate of the workforce numbers expected during the construction and operation phases.

4.12 Decommissioning

This section should outline the planned decommissioning of the proposal and establish decommissioning objectives and goals.

It should include details of:

- The original environment;
- Procedures for decommissioning;
- The environmental, economic and social viability of options for component removal including the removal of any ballast and rock armour;
- Rehabilitation;
- Proposed timeframes including project lifespan; and
- The planned final environment.

The section should also address:

- Integration of the decommissioning and rehabilitation program with project design, construction and operation;
- Options for the removal of all infrastructure;
- Final use for the project area within a cumulative context, taking into consideration expected regional changes; and
- A commitment to community consultation in determining the final environment.

5 Alternatives

Alternative proposals must be discussed, including detailed reasons for the selection and rejection of particular options. The selection criteria must be discussed, and the advantages and disadvantages of preferred options and alternatives detailed. The short, medium and long-term potential beneficial and adverse impacts of each of the options should be considered and associated risks detailed and analysed.

Alternatives to be discussed must include:

- Not proceeding with the proposal;
- Site selection within the Darwin region;

- Alternative locations for various components of the proposal;
- Alternative gas and condensate processing scenarios, onshore and offshore;
- Alternative scenarios for development of port facilities;
- Alternatives to foreshore reclamation;
- Alternative dredge methods considered and dredge spoil disposal locations;
- Alternative sources of raw materials for the project, including water supply and fill/borrow materials; and
- Alternative environmental management techniques for moderate or higher risk impacts.

6 Risk Assessment

6.1 Risk Assessment Approach

This EIS should be undertaken with specific emphasis on identification, analysis and treatment of risks through a whole-of-project risk assessment. Through this process, the EIS will:

- Acknowledge and discuss the full range of risks presented by the proposed action including those of special concern to the public;
- Quantify (where possible) and rank risks so that the reasons for proposed management responses are clear;
- Acknowledge levels of uncertainty about estimates of risk and the effectiveness of risk controls;
- Extend risk assessment to problems in realising benefits; and
- Discuss the residual risks and their consequences expected to be borne by the community, providing better understanding of equity issues.

Statements about levels of uncertainty should accompany all aspects of the risk assessment. Steps taken to reduce uncertainty or precautions taken to compensate for uncertainty should also be identified and their effect/s demonstrated.

Information provided should permit the reader to understand the likelihood of the risk, its potential severity, and any uncertainty about the effectiveness of controls. If levels of uncertainty do not permit robust quantification of risk, then this should be clearly acknowledged.

The risk assessment should be based on international best practice. Processes for risk management are formalised in Standards Australia / Standards New Zealand (eg. AS/NZS 4360:2004; HB 436:2004; HB 158:2006).

6.2 Hazards & Risks to Humans and Facilities

The EIS should include an assessment of the risks to people, the environment and nearby facilities associated with the construction, operation and maintenance of the various components of the proposal, and the storage and transport of materials to and from the complex. The aim of this assessment is to demonstrate that:

- The proponent is fully aware of the risks to human health and safety associated with all aspects of the development;
- The prevention and mitigation of risks to human health and safety are properly addressed in the design specifications for the facility; and
- The risks can and will be managed effectively during the construction, commissioning, operation, and decommissioning of the development.

Sufficient quantitative analysis should be provided to indicate whether risks are likely to be acceptable compared with similar ventures in Australia and Internationally. Assumptions used in the analyses should be explained. Relevant standards, codes and best practice methodologies that minimise risks should be discussed.

The risk assessment should, as a minimum, address:

- Potential impacts associated with siting the project within Darwin Harbour, close to populated areas and an existing LNG facility;
- Perceptions of risk to the surrounding community;
- Third party interference;
- The effect of unusual and extreme weather conditions or seismic events on vulnerable components of the project;
- Climate change impacts based on scenarios developed in and since the IPCC 2007 Report;
- Catastrophic failure of components;
- Potential impacts from an incident on health and safety;
- Consequences of possible incidents; and
- Potential accidents associated with construction, operation, maintenance and decommissioning of the various components of the proposal, including storage and transport of materials to and from the complex.

The EIS should draw from the experiences of similar industries nationally and internationally, citing examples where appropriate.

Detailed emergency plans and response procedures will need to be developed as a contingency in the event of an emergency or accident and provided in the final Environmental Management Plan. Responsibilities and liabilities in such an event should be included.

The hazard and risk analysis will identify the critical areas that need to be addressed in management plans, monitoring programs, contingency and emergency plans.

7 Existing Environment, Potential Impacts and Management

These guidelines detail the information requirements with respect to the environmental issues and factors identified for the project. A description of the existing environment, relevant impacts, potential issues and proposed mitigation measures must be provided for the proposal site and also for surrounding areas that may be affected by the proposed action.

The EIS should demonstrate that the proponent has identified all risks associated with the relevant factors and issues raised, undertaken comprehensive assessment of those risks (including quantification where practicable) and identified effective controls, particularly for those risks that are significant.

Studies to describe the existing environment should be of a scope and standard sufficient to serve as a benchmark against which the impacts of the project may be assessed and monitored over the life of the project and after decommissioning if required. Control areas not predicted to be impacted by the project should be included in proposed studies, and long-term monitoring locations in putative impact and control areas should be established.

All potential relevant impacts must be described, including those within the proposal site and its surrounds, as they relate to the matters protected under the EPBC Act and other environmental factors in general, during construction, operation and decommissioning phases of the proposal. This must also include an assessment of the level of significance of the impact, at the local, regional and global levels (e.g. global and national implications of greenhouse gases and the localised impact of service roads or artificial water bodies).

Cumulative impacts must also be discussed. The reliability and validity of forecasts and predictions, confidence limits and margins of error must be indicated as appropriate.

The timeframe over which impacts would be likely to occur and persist must be considered in the assessment. For example, some operational impacts might have a lifespan of 50 to 100 years and should be assessed accordingly.

Mitigation measures must also be discussed with particular focus on matters protected under the EPBC Act and other matters determined to be at moderate or greater risk of impact. Specific and detailed measures must be provided and substantiated, based on best available practices.

Table 1 includes issues and potential impacts that must be discussed; however, the EIS must also assess any other relevant impacts and issues that emerge throughout the process of preparing the EIS.

Table 1:Existing Environment, Potential Impacts & Environmental Management

Factor	Baseline (Existing Environment)	Potential Impacts	Safeguards, Management & Monitoring
Landform	• Provide detailed maps and an interpretation of regional and local topography, geology, and geomorphology. • Provide results and interpretation of any geotechnical investigations undertaken to assess the suitability of relevant proposal components. • Discuss the soil/sediment types and land units within the project footprint including actual and potential acid sulfate soils, and existing levels of erosion and other disturbances. • Discuss the available and potential sources of fill / borrow material for the project. • Describe regional geology /geomorphology including seismic stability. • Discuss landform features of economic/social/ heritage/other significance.	• Detail the extent and implications of possible impacts to landform features/sites from construction of relevant project components. • Discuss the potential impacts of extraction and fill activities associated with the project. • Provide details of limiting properties of soil and substrate types and land units in the project footprint including consideration of erosion, acid generation, land stability, rehabilitation and any specific management requirements.	• Detail measures to avoid/minimise identified impacts. • Provide management plans to address the potential environmental impacts arising from identified landform limitations. • Explain how the safeguards will work and the monitoring required to maintain those safeguards.
Oceanic processes and natural features	• Provide maps and interpretation of regional bathymetry and local-scale seabed features. • Provide results and interpretation of any geotechnical investigations undertaken to assess the suitability of components of the proposal. • Describe the oceanic processes within Darwin Harbour and the offshore proposal area such as local & regional tides, current patterns and wave magnitudes. • Provide details of any tidal inundation areas and storm surge zones.	• Discuss the potential impacts of project components/ activities such as site preparation, component construction, dredging and spoil dumping, spills, waste/produced water discharge and port operation on all aspects of marine waters, oceanic processes and natural features. • Detail the extent and implications of, and other possible impacts on and from, coastal processes, such as erosion, currents and storm events. • Appropriate modelling of sediment plumes from dredging activities and offshore spoil disposal must be undertaken, as well as	• Detail measures to avoid/minimise identified impacts. • Provide management plans to address the potential environmental impacts; • Explain how the safeguards will work and the monitoring required to maintain those safeguards. In particular, discuss: • The treatment and disposal of wastewater into the marine environment (eg. Ballast water, produced water, waste water discharge, hydrostatic test water); • The management of dredge spoil; and • The protection of seabed features and subtidal/intertidal areas during dredging and spoil disposal activities, and construction.

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
	• Provide details on water quality of marine waters including temporal and spatial variations that are appropriate for the locations of the project components and the nature of their potential impacts. • Provide details on any natural and historic heritage values within the Commonwealth marine environment affected by the proposal.	modelling of hydrocarbon spill risks, produced water discharge, scouring effects, sediment deposition and erosion, and dispersion of any other contaminant plumes. • Identify and discuss the expected changes in hydrodynamics from infrastructure installations and biophysical consequences of these changes. • Detail the extent and implications of possible impacts to seabed features/sites from dredging and spoil disposal activities, construction and/or operation of all project components. • Describe the impacts of any reclamation on the marine and coastal environment.	
Water	Describe and discuss: • Local meteorology in the context of project environmental management including the frequency and severity of extreme weather conditions such as storms and cyclones for the 2, 10 and 100 year average return interval events (accounting for climate change scenarios); • Natural/artificial, permanent/ephemeral catchment system(s), drainage lines, waterways, wetlands and ground water systems; • Hydrology/hydrogeology including drainage patterns, flow/discharge rates, likelihood of flooding, etc; • Water quality of fresh waters including temporal and spatial variations; and • Beneficial uses and environmental values of water resources in the project locality.	Identify and discuss in detail: • Potential impacts of project components/ activities such as site preparation, component construction, spills, and waste water disposal on all aspects of fresh/ground waters; • Project water supply requirements, available sources and impacts on sources; • Implications of local weather impacts on establishment and operation of all project components; • Expected changes in stormwater run off and impacts on existing natural systems; • Expected impacts on the Beneficial Uses and environmental values identified; and • Impacts of water quality on the food chain, particularly species gathered by indigenous community and fishers.	• Detail measures to avoid/minimise identified impacts. • Provide management plans to address the potential environmental impacts. • Explain how the safeguards will work and the monitoring required to maintain those safeguards. In particular, discuss: • Treatment and disposal of wastewater (eg hydrostatic test water, process water, sewage, etc) including preferred options and selection criteria; • Protection of beds & banks of watercourses. Include any preferred methodologies of Land and Water Division, NRETAS; • Water Quality protection including acid sulphate soil & wetland/waterway crossing management; • Details of how the Beneficial Uses will be protected and maintained; and • Design of stormwater management systems relevant to the local meteorology, including capacity and resilience of any existing natural drainage systems that will be implicated in stormwater management.

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
Air Quality	• Identify sensitive receptors adjacent to the project area and/or likely to be impacted by the project and discuss their potential level of sensitivity to air quality aspects; • Record applicable onshore ambient air quality parameters for representative periods within both wet and dry seasons prior to plant operation. Parameters include dust (in particular the PM_{10} fraction) and odour. • Include meteorological information applicable to air quality parameters.	• Describe the expected noise levels and vibration associated with the project construction and operation, including timing and duration, in comparison to background levels, sensitivity of receptors and nominated performance indicators and standards. • Determine and quantify all air emissions that will be produced by the project including: ⇒ An estimate of total annual quantities that will be emitted; ⇒ Emission rates and total emissions from each point source; and ⇒ An estimate of fugitive emissions. • Atmospheric dispersion modelling must be undertaken of the major emissions identified for the project. Modelling should take into account the cumulative and synergistic impacts of this proposal with emissions from the current and future Wickham Point LNG Plant and other point sources in the region, as well as relevant diffuse sources, in particular, bushfires. • Assess the need for an ambient air quality monitoring program to monitor ground level impacts of significant air pollutant emissions. • Assess and discuss the impacts on the community, nearby businesses and the environment from dispersion of emissions from the project. Include the risks of a failure of critical pollution control equipment and possible outcomes. • Identify expected odour generating activities and the potential impacts of odour on the community.	• Detail measures to avoid/minimise identified impacts, including: 1. An outline of the measures that will be employed for monitoring and dealing with gas leakages during operations; 2. Methods for minimising odour emissions; and 3. Dust suppression initiatives. Discuss and recommend dust suppression strategies and monitoring of dust impacts. • Explain how the safeguards will work and the monitoring required to maintain the safeguards. • Provide management plans to address the potential environmental impacts.
Noise & Vibration	• Identify sensitive receptors (resident	• Identify any major sources of noise and/or	• Discuss measures that would be used to

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
	and transitory) within or adjacent to the project area and provide detail on their potential level of sensitivity to noise and vibration. All EPBC Act protected species that may occur in the area must be considered including: ⇒ Natator Depressus (Flatback Turtle); ⇒ Lepidochelys olivacea (Pacific Ridley); ⇒ Eretmochelys imbricata (Hawksbill Turtle); ⇒ Dermochelys coriacea (Leatherback Turtle); ⇒ Chelonia mydas (Green Turtle); ⇒ Caretta caretta (Loggerhead Turtle); ⇒ Tursiops aduncus (Spotted Bottle-nose Dolphin) – Arafura/Timor Sea populations; ⇒ Sousa chinensis (Indo-Pacific Humpback Dolphin); ⇒ Balaenoptera musculus (Blue Whale); ⇒ Megaptera novaeangliae (Humpback Whale); ⇒ Balaenoptera bonaerensis (Antarctic Minke Whale); ⇒ Balaenotpera edeni (Bryde's Whale); ⇒ Dugong dugon (Dugong); ⇒ Orcaella brevirostris (Irrawaddy Dolphin); ⇒ Orcinus orca (Orca, Killer Whale); ⇒ Physeter Macrocephalus (Sperm Whale). • Identification of sensitive receptors must be undertaken in consultation with DEWHA.	vibration from the proposal (including transient and temporary noise producers during construction and operation). • Provide details of modelling studies undertaken to determine the level and extent of noise and vibration produced in comparison to background levels, sensitivity of receptors and nominated performance indicators and standards. • Undertake a risk assessment of the potential for underwater noise associated with the construction and operation of the project to significantly impact upon those sensitive receptors identified, or upon habitats and processes that are necessary for their survival. If the risk assessment identifies potential sources of significant impacts, modelling of outputs from these sources must be undertaken. • Timing of activities producing noise must be planned to consider migratory marine fauna and any potential impacts on fauna in this context must be discussed. • Identify any species that may be impacted by noise or vibration produced from the proposal and provide details of possible impacts.	avoid/minimise any potentially significant impacts of noise and vibration, including attenuation of noise in the marine water column. • Provide management plans to address the potential environmental impacts. • Explain how the safeguards will work and the monitoring required to maintain the safeguards.

Factor	Baseline (Existing Environment)	Potential Impacts	Safeguards, Management & Monitoring
	• Record background noise parameters over an appropriate representative period. • Identify any existing sources of noise pollution in the area. • Include meteorological information applicable to noise parameters.		
Ecological values	• Describe floral & faunal species (including exotic/pest species) and biological communities (including marine, estuarine, freshwater, terrestrial) including those of local, regional and national significance[1] that are found within and around the project area. These must include those EPBC Act listed marine species listed above and: ⇒ Xeromys myoides (False Water Rat) ⇒ Dasyurus hallucatus (Northern Quoll) ⇒ Sterna albifrons (Little Tern) ⇒ Puffinus leucomelas (Streaked Shearwater) ⇒ Calonectris leucomelas (Streaked Shearwater) ⇒ Apus pacificus (Fork-tailed Swift) ⇒ Tringa brevipes (Grey-tailed Tattler) ⇒ Arenaria interpres (Ruddy Turnstone).	• Specify the extent of clearing required in the project footprint[2]. • Describe direct, indirect, consequential and cumulative impacts on species/ communities/habitats and food webs, including those of local/regional/national significance. Impacts to be considered include: ⇒ Land clearing and disturbance; ⇒ Habitat removal, destruction and compromise; ⇒ Contaminant discharges and pollutants; ⇒ Smothering of benthic substrates and corals; ⇒ Changes to hydrology; ⇒ Exotic species introduction, including the identification of the potential for introduction and/or spread of pest species/noxious weeds (including marine species); ⇒ fauna entrapment in pipeline trench or underwater infrastructure;	• Discuss measures to minimise identified impacts on species, communities and habitats. • Discuss methods to manage/minimise exotic fauna species introduction and spread. • Detail rehabilitation and monitoring strategies. • Explain how proposed safeguards will work and the monitoring required to maintain those safeguards. • Provide management plans to address the potential environmental impacts.

[1] Significant vegetation includes:
- ⇒ rare, threatened, endangered and regionally restricted species, vegetation types or habitats;
- ⇒ communities that are particularly good examples of their type;
- ⇒ vegetation types which are outside their normal distribution or have other biogeographical significance;
- ⇒ ecologically outstanding areas which have importance beyond the immediate site, eg. wetlands, riparian forests, etc; and
- ⇒ vegetation which is the habitat of rare and threatened fauna or has outstanding diversity.

[2] Statutory obligations under NT legislation (e.g. *Planning Act & Pastoral Land Act*) for vegetation clearing must be met.

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
	• Maps must be provided showing the distribution of species and communities described. • Survey methodologies must: ⇒ Follow best practice & advice from relevant agencies; ⇒ Account for seasonality, potential for occurrence of significant species & sensitivity of species to disturbance; ⇒ Identify rare, threatened, endangered species against relevant NT & Commonwealth legislation. Particular reference must be made to species and ecological communities listed as threatened under the EPBC Act that (through analysis) may potentially be disturbed by the project; ⇒ Consider migratory species, and species with conservation and biodiversity values in the project area; ⇒ Consider species with economic value; and ⇒ Consider species with indigenous conservation values. • Survey work must be conducted by suitably qualified personnel. • Include survey methodologies and results in appendices. • Include any survey limitations with reference to best practice methodology. • Provide mapping (at a level appropriate to the types and magnitudes of potential impacts from project activities) and descriptions of marine and	⇒ Boat strike; and ⇒ Illumination and lighting, including disorientation of fauna such as marine turtles and seabirds/shorebirds from illumination of offshore infrastructure, support vessels and ongoing operations. • Include an analysis of the significance of the relevant impacts on EPBC Act protected matters. The analysis must conform to relevant EPBC Act policy statements. • Include a statement of whether there will be any relevant impacts that are likely to be unknown, unpredictable or irreversible. • Discuss the implications of the identified impacts on the Indigenous and non-indigenous access to and use of flora and fauna. • With respect to lighting impacts, discuss the potential for disorientation of fauna such as marine turtles and seabirds/shorebirds from illumination of infrastructure, support vessels and ongoing operations. • Identify the potential for introduction and/or spread of pest species/noxious weeds (including marine species).	

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
	intertidal benthic habitats potentially at risk of impact from the construction and operation of onshore and offshore components of the proposal. The appropriate level of mapping must be determined in consultation with DEWHA.		
Land Use	• Identify zoning, uses and features within the project locality including: ⇒ Urban and rural residential; ⇒ Agricultural, pastoral, fisheries and shipping; ⇒ Conservation, wilderness, and scenic areas; ⇒ Indigenous land use; ⇒ Recreational land use, and areas of research, educational and scientific value; ⇒ Road reserves and pipeline easements; ⇒ Military reserves or exercise areas; ⇒ Extractive, mining and other commercial industries; and ⇒ Land/Sea titles and rights e.g. those granted under *Native Title Act 1993.* • Include Map/s showing jurisdictions and responsible authorities for the areas described above and a description of the regulatory regime applying to each area.	• Describe, including timeframes, the anticipated and potential site specific and cumulative impacts on existing and potential uses and developments during the construction and operation phases. The proponent is required to consult with responsible authorities for policies on such disturbances. • Include a discussion of the potential issues associated with a flare on Darwin Airport flight paths. • Discuss the likely impacts on the land use status and ownership of the land crossed by various components of the project in terms of land acquisition and compensation. This discussion should include any Indigenous ownership, native title claimants and holders, and land use.	• Outline measures to minimise the impacts to current and future uses of land and water in the project area. • Detail measures to rehabilitate areas impacted by the project. • Outline consultation processes to be undertaken with key stakeholders.
Visual Amenity	• Discuss the current general amenity of Darwin Harbour. • Discuss the visual amenity of the proposed project site from the	• Describe the potential impacts to the visual amenity of Darwin Harbour generally, and from agreed viewing points specifically, of the construction activities in the harbour and	• Describe methods to minimise impacts to visual amenity.

Factor	Baseline (Existing Environment)	Potential Impacts	Safeguards, Management & Monitoring
	perspective of agreed viewing points around Darwin Harbour and taking into account the values of the general Darwin regional community.	an operating facility on Blaydin Point. • Describe the impact to visual amenity of the project site post-operations.	
Historic & Cultural Heritage Values	Identify all indigenous/non-indigenous places of historic or contemporary cultural heritage significance including[3]: • areas nominated for listing or listed on the Register of the National Estate or the Northern Territory Heritage Register, or Interim listing on either of these Registers; • areas nominated for listing or listed on Commonwealth and Territory Heritage registers and Commonwealth and Territory registers of indigenous cultural heritage; • sacred sites - provide evidence of an Authority Certificate under the *Northern Territory Aboriginal Sacred Sites Act 1989* and compliance with protection of sites under both the *Aboriginal Land Rights (Northern Territory) Act 1976* and the *Northern Territory Aboriginal Sacred Sites Act 1989;* • Traditional and historic Aboriginal and Torres Strait Islander (ATSI) archaeological and heritage places and objects protected under relevant Territory (eg *NT Heritage Conservation Act*) and/or Commonwealth legislation; • Any historic shipwrecks that may be encountered and are protected under	• Describe potential impacts to the features identified in baseline studies including lifestyles, traditional hunting/fishing practices, heritage places, indigenous/non-indigenous culture generally and the impact of increased visitation.	• Detail measures to mitigate impacts to any features at risk from the project. • A management plan should be developed to include: ⇒ Procedures to avoid significant areas; ⇒ Ongoing protection measures; and ⇒ Procedures for the discovery of surface or sub-surface materials during the course of the project. ⇒ Every attempt should be made to avoid any significant heritage areas when locating project components.

[3] This should be done through community consultation, historic research and field survey. No information of a confidential nature (particularly that related to anthropological matters) relevant to indigenous people or groups is to be disclosed in the EIS. However, the EIS must describe the arrangements that have been negotiated with relevant indigenous groups in relation to anthropological and archaeological surveys. Advice and permits on the conduct of these studies should be sought from the responsible authorities.

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
	the *Historic Shipwrecks Act 1976*; • Other wrecks encountered, including the Catalina flying boat wrecks[4]; • European and Macassan historic sites; and • Areas with special values to indigenous and non-indigenous people (e.g. traditional land use, landscape, visual environment, recreational, commercial, tourism, fisheries, scientific, educational, marine archaeological sites). Qualify the methods used to identify surface and sub-surface cultural anomalies, and the resolution allowed by those methods.		
Social Environment	• Identify key stakeholders, regional community structures and community vitality (including demography, health, education and social well-being, access to services and housing, etc). • Estimate local employment including a breakdown of skills/trades required and specific opportunities for skills development.	• Identify opportunities for training and employment during construction of the project and how this would be structured, managed and implemented. • Identify opportunities for local industry and indigenous/non-indigenous workforce participation in the construction and operation of the project. • Outline possible future benefits for the community following construction. • Outline the accommodation requirements and arrangements for construction and maintenance activities and any associated infrastructure and services required. • Discuss the potential negative social impacts that could arise from the project including the impacts of the	• Identify measures to reduce negative impacts and maximise benefits.

Factor	Baseline (Existing Environment)	Potential Impacts	Safeguards, Management & Monitoring
		construction/operation and its workforce/maintenance teams on affected landowners and communities, recreational users, local health services, etc.	
Economics	• Discuss the current local, regional, state and national economic viability (including economic base and economic activity, future economic opportunities and contribution to the Northern Territory economy).	• Present a summary of the project's impact on the regional/territory/national economies in terms of direct/indirect effects on employment, income and production including the broader development benefits of the project. • Consider the effects of disturbance to existing land use or threat to the surrounding environment such as the harbour, coastline and mangroves that may impact on current and future commercial activities. • Describe opportunities available to regional centres/communities based on the activity generated by the project and the availability of gas and other services to existing and potential customers.	• Detail measures to minimise potential adverse impacts identified and maximise the beneficial impacts.
Infrastructure & Transport	• Provide a plan detailing existing transport networks (including road, air and ports), telecommunications (optic fibre routes), gas and electricity infrastructure, and water supply and wastewater utilities. • Identify constraints with existing infrastructure and transport networks within the project context. • Provide details of new infrastructure that will be required for the project including any upgrades. • Describe transport systems, methods and routes for delivering construction and maintenance materials and other necessary goods and consumables	• Provide information on the use of and impact on infrastructure required by the project. • Discuss project water supply requirements, available sources and impacts on sources. • Discuss potential impacts of transport operations on public amenity (eg impact of infrastructure corridor/road directly passing proposed housing estate, noise, light, dust). • Provide information on the use of and impact on port, road, air and rail networks for the construction and operational phases.	• Detail the management of impacts on the road system and other existing infrastructure, including proposed corrective measures (in consultation with relevant regulatory agencies) and relevant guidelines used for construction and operational and maintenance phases. Include measures to upgrade, maintain and restore gazetted or nominated roads and access tracks, and to undertake pipeline crossings of tracks. • Discuss lighting plans and measures that will be employed to avoid interference with safe navigation of Darwin Harbour. • Outline requirements and responsibilities for rehabilitation or maintenance of roads and other project infrastructure upon project completion.

Factor	**Baseline (Existing Environment)**	**Potential Impacts**	**Safeguards, Management & Monitoring**
	including a general description of requirements for upgrading existing transport routes. • Provide details of approvals and agreements obtained by the relevant government bodies regarding infrastructure requirements such as trade waste disposal, water and sewerage, and road access.		
Biting Insects	• The existing biting insect species and populations, and their seasonal variability in the project area should be understood. • A biting insect assessment report is available for Blaydin Point. The recommendations and conclusions from this report should be included in the EIS.	• Discuss the impact of biting insects on workforce & residents. • Discuss the impacts of the project on biting insect populations/habitats.	• Outline measures to prevent increase in biting insect habitats/populations, particularly in tidal areas. • Refer to the guideline: Construction Practice Near Tidal Areas of the Northern Territory – Guidelines to Prevent Mosquito Breeding. Ph: (08) 8922 8901 for information.
Greenhouse Gas Emissions	Refer to the NT Environmental Impact Assessment Guide – Greenhouse Gas Emissions and Climate Change – Attachment 3. Additionally, the risks and liabilities associated with failure of proposed sequestration methods such as the significant loss of tree plantings should be fully discussed.		

Factor	Baseline (Existing Environment)	Potential Impacts	Safeguards, Management & Monitoring
Waste & hazardous materials Management	• Identify and describe (amount and characteristics) all wastes and their sources, including hazardous wastes, associated with construction, operation and decommissioning of all project components. • Detail all chemicals, including fuels, to be stored and/or used on the project site. Outline the proposed methods for transportation, storage and use of these substances. • Detail other possible hazardous materials that may be derived from construction and operation of the project.	• Discuss the potential impacts associated with identified wastes and loss/spills of hazardous materials. • Include a discussion of NORMs. • Identify and discuss activities likely to give rise to an environmental nuisance as defined under the *Waste Management and Pollution Control Act*. • Discuss the potential impacts on the Shoal Bay landfill and other primary landfills in the Litchfield Shire, and on other users of these facilities.	• Discuss waste management strategies including avoidance, reduction, reuse, recycling, storage, transport and disposal of waste. • Outline all government approvals and agreements required and obtained for all waste disposal and management matters. • Outline how any contaminated soils will be managed and the controls that will be put in place to prevent contaminants from leaving the site. • Discuss hazardous materials management. • Environmental & Safety management programs should include: ⇒ Contingency/response plans; ⇒ Spills & containment; and ⇒ Hazardous materials data & storage. • Waste Water (see *Oceanic Processes* and *Water* section of these guidelines). Further information can be found at: http://www.health.nt.gov.au/Environmental_Health/Wastewater_Management/index.aspx.
Fire	• Current fire regimes and risk of wildfire.	• Identify activities that pose a risk of wildfire.	• Develop a fire management plan in consultation with relevant stakeholders outlining fire response plans, wildfire prevention methods, etc.

8 Proposed Project Environmental Management

Specific safeguards and controls, which are proposed to be employed to minimise or remedy environmental impacts identified in Section 7, are to be outlined. These are to be covered in detail in the Environmental Management Plans (EMP). Separate EMPs are required to address those matters protected by the EA Act and those matters protected by the EPBC Act.

8.1 EA Act

The draft EMP should be strategic, describing a framework for environmental management for construction and operational phases of the project; however, as much detail as is practicable should be provided to enable adequate assessment during the public exhibition phase. Where possible, specific management policies, practices and procedures should be included in the draft EMP. The EMP would be finalised at the conclusion of the assessment, taking into consideration comments on the EIS and incorporating the Assessment Report recommendations and conclusions.

The draft EMP should:

- Define the management structure of the construction, operational and decommissioning phases and its relationship to the environmental management of the site;
- Describe the proposed measures to minimise adverse impacts (including those mentioned in Section 7) and the effectiveness of these safeguards;
- Provide performance indicators by which all anticipated and potential impacts can be measured;
- Include identification of responsibilities;
- Describe how employees and visitors will be made aware of environmental responsibilities and safeguards (including an induction process);
- Describe monitoring programs to allow early detection of adverse impacts;
- Describe how monitoring will be able to determine the differences between predicted and actual impacts;
- Describe remedial actions for any impacts that were not originally predicted;
- Include a summary table listing the undertakings and commitments made in the EIS, including clear timelines for key commitments and performance indicators, with cross-references to the text of the report; and
- Provide for the periodic review of the management plan itself.

Reference should be made to relevant legislation, guidelines and standards, and proposed arrangements for necessary approvals and permits should be noted. The agencies responsible for implementing and overseeing the management plan should be identified. Proposed reporting procedures on the implementation of the management plan, independent auditing or self-auditing and reporting of accidents and incidents should also be described.

8.2 EPBC Act

An EMP/s should be prepared to address the impacts on matters of NES identified in Section 7 and any associated mitigation measures and monitoring, management, enforcement and review procedures. Details on what should be included within an EMP addressing matters of NES are at Attachment 4.

9 Proposed Offsets

Where impacts are reasonably unavoidable or can not be mitigated, offsets should be proposed that deliver a real conservation outcome. Proposed offsets should target the matter protected by the EPBC Act that is being impacted. Given the nature and location of the potential impacts of the proposal, direct offsets such as acquisition of habitat areas may not be suitable. It is recommended that indirect offsets be proposed, such as:

- Implementation of recovery plan actions for threatened and/or migratory species; and
- Contributions to relevant research programs targeting threatened and/or migratory species.

10 Public Involvement and Consultation

The EIS has an important role in informing the public about this proposal. It is essential that the proponent demonstrate how public concerns were identified, and will influence the design and delivery of the project. Public involvement and the role of government organisations should be clearly identified. The outcomes of surveys, public meetings and liaison with interested groups, such as the Darwin Harbour Advisory Committee, Larrakia Nation and other non-government organisations, should be discussed and any resulting changes made to the proposal clearly identified. Details of any ongoing liaison should also be discussed.

An outline of negotiations and discussions with local government, the Northern Territory Government and the Australian Government should be provided.

A stakeholder communication plan should be included in the EIS to facilitate consultation, information sharing and involvement with Government and the local community during the planning, construction, operation and decommissioning of the project.

ATTACHMENT 1

MATTERS THAT MUST BE ADDRESSED IN A PER / EIS (SCHEDULE 4 OF THE EPBC ACT REGULATIONS 2000)

1 General information

1.01 The background of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action;

(h) the consequences of not proceeding with the action.

2 Description

2.01 A description of the action, including:

(a) all the components of the action;

(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;

(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;

(d) relevant impacts of the action;

(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;

(f) any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;

(g) to the extent reasonably practicable, any feasible alternatives to the action, including:

(i) if relevant, the alternative of taking no action;

(ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action;

(iii) sufficient detail to make clear why any alternative is preferred to another;

(h) any consultation about the action, including:

(i) any consultation that has already taken place;

(ii) proposed consultation about relevant impacts of the action;

(iii) if there has been consultation about the proposed action — any documented response to, or result of, the consultation;

(i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3 Relevant impacts

3.01 Information given under paragraph 2.01 (d) must include:

(a) a description of the relevant impacts of the action;

(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;

(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

(d) analysis of the significance of the relevant impacts;

(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4 Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01 (e) must include:

(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;

(b) any statutory or policy basis for the mitigation measures;

(c) the cost of the mitigation measures;

(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program;

(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.

5 Other approvals and conditions

5.01 Information given under paragraph 2.01 (f) must include:

(a) details of any local or State government planning scheme, or plan or policy under any local or State/Territory government planning system that deals with the proposed action, including:

(i) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy;

(ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required;

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6 Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation — details of the corporation's environmental policy and planning framework.

7 Information sources

7.01 For information given in a draft public environment report or environmental impact statement, the draft must state:

(a) the source of the information; and

(b) how recent the information is; and

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.

ATTACHMENT 2

Australian Government

Department of the Environment and Water Resources

Guidelines for Biological Survey and Mapped Data

Revised 17 July 2006

Introduction

The Department of the Environment and Water Resources (DEW) uses point-based fauna and flora survey and mapped data to support decision making on referral applications, assessments and approvals under the *Environment Protection and Biodiversity Protection Act 1999* and to assist in the protection and recovery of species and communities.

This document outlines data and information requirements for threatened species, migratory species, listed marine species, cetaceans and invasive species to support DEW decision making.

DEW data requirements

For species listed under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) the following data and information should be provided with referral applications and environmental impact assessments undertaken by proponents. Provision of data and the related information indicated will help facilitate decision making by DEW. The information derived from data provided will be used more widely by DEW for the ongoing protection of species and communities listed under the EPBC Act:

- incidental records of listed species in the project area
- records of listed species from systematic flora/fauna surveys relevant to the project area
- details of all systematic flora/fauna surveys (site/survey details only) relevant to the project area
- records of non-listed species where the matter protected by the Commonwealth legislation is the environment
- documentation describing the data. The documentation should include information about the taxonomy used and a description of the survey methods; and
- derived indicative distribution maps of likelihood of occurrence of species, including breeding and other ecologically important areas.

The core data for biological observations are:

- Scientific name of species
- Geocode of observation - preferably latitude and longitude, although AMG/MGA coordinates in the form zone/easting/northing are acceptable
- Datum of the geocode, e.g. GDA 94 (preferred), WGS 84, AGD/66/84. If uniform for dataset include in basic metadata
- Precision of the geocode, typically radius in metres, may be a grid block; GPS co-ordinates have a precision of 15 – 100 metres
- Date range of the observation

The following supplementary information is also required (where applicable):

- Written locality
- Common name
- Name of the collector/observer
- Survey method and survey effort
- Number of individuals counted
- Reliability of the observation, e.g. confirmed, doubtful, backed by voucher specimen collected under permit (include voucher number)
- Data source and record identifier - to distinguish data collated from other sources.

The preferred formats for providing data are shown in Attachments 2 and 3. Basic metadata should be provided for incidental records and small amounts of project data (see Attachment 1). Large datasets should be documented following the *ANZLIC Metadata Guidelines* Version 1, July 1996.

Data provided to DEW undergoes a number of validation checks before it is used. DEW may need to approach the custodian for further checking and verification where records do not meet all checks.

Data Format and File Specifications

Database point records

Data should preferably be supplied as ASCII delimited text, MS Excel, MS ACCESS or Oracle export format files in the formats indicated below. Where delimitation is by commas, quotes should be placed around text fields as these may already include commas.

Often it is easiest to supply a dump of data as it is stored in a database. If the data requires reformatting a possible model is presented in Attachment 3.

The following records are not required:

- records of cultivated specimens, escapees or of doubtful status (unless specifically requested)
- records with a geocode precision of more than 10 000 metres.

Fields with unknown or null values should be set to blank or 'null', never zero.

Spatial Data

Spatial data should be supplied in an electronic format that can be read by the ESRI ArcGIS, ArcInfo or ArcView geographic information system software. The preferred format is as ESRI shape files.

All datasets and their attributes should be documented according to the guidelines in Attachment 1.

Spatial information should be supplied in geographic decimal-degree coordinates. The datum must be specified. The preferred datum for data provided is the Geocentric Datum of Australia (GDA94).

If a non geographical projection is used, then information about the projection type and its parameters need to be provided. This includes information about major and minor axes, central meridian, standard parallels, latitude origin and false origin and the datum and spheroid.

Where indicative distribution maps are prepared the following mapped categories may be utilized:

RANK	CATEGORY	CODE
10	Listed Critical Habitat	CH
21	Breeding known to occur within area	BK
22	Roosting known to occur within area	RK
23	Foraging known to occur within area	FK
24	Congregation or aggregation known to occur within area	AK
25	Migration route known to occur within area	MK
26	Species or species habitat known to occur within area	SK
27	Community known to occur within area	CK
28	Translocated population known to occur within area	TK
31	Breeding likely to occur within area	BL
32	Roosting likely to occur within area	RL
33	Foraging likely to occur within area	FL
34	Congregation or aggregation likely to occur within area	AL
35	Migration route likely to occur within area	ML
36	Species or species habitat likely to occur within area	SL
37	Community likely to occur within area	CL
41	Breeding may occur within area	BM
42	Roosting may occur within area	RM
43	Foraging may occur within area	FM
44	Congregation or aggregation may to occur within area	AM
45	Migration route may occur within area	MM
46	Species or species habitat may occur within area	SM
47	Community may occur within area	CM
50	Extinct within area	EX

These categories are designed to indicate areas of biological importance, and the spatial certainty of the information, for example, where a species is precisely mapped at a local scale it would be mapped as *species or species habitat known to occur within area*; for a species only has a general distribution maps it would be mapped as *species or species habitat may occur within area*.

Basic metadata should be provided for the spatial data as identified in Attachment 1. Large datasets should be documented following the *ANZLIC Metadata Guidelines* Version 1, July 1996.

Attachment 1
Basic metadata for Biological Survey Data provided to
Australian Government, Department of the Environment and Water Resources

Custodian *Person/Organisation responsible for the data; and contact details*	
Name of dataset *A name/title for the survey dataset*	
Project area *Description of the area surveyed*	
Survey targets and methods *Brief description of species targetted and the survey methods employed*	
Survey dates *The first and last dates of surveys*	
Spatial data *Type of spatial data, e.g. ESRI Shapefiles, spreadsheet of species records. Also, describe the spatial coordinate system, e.g. geographical, AMG; and datum, e.g. GDA 94, WGS 84, AGD66/84*.	
Limitation on use of data *Outline any constraint on the use of the data.*	
Comments	

DEW Use only	
DEW Contact and Section	
Referral Id/ File number	

Attachment 2

Possible format for the incidental data

Incidental records (incidental.xls)

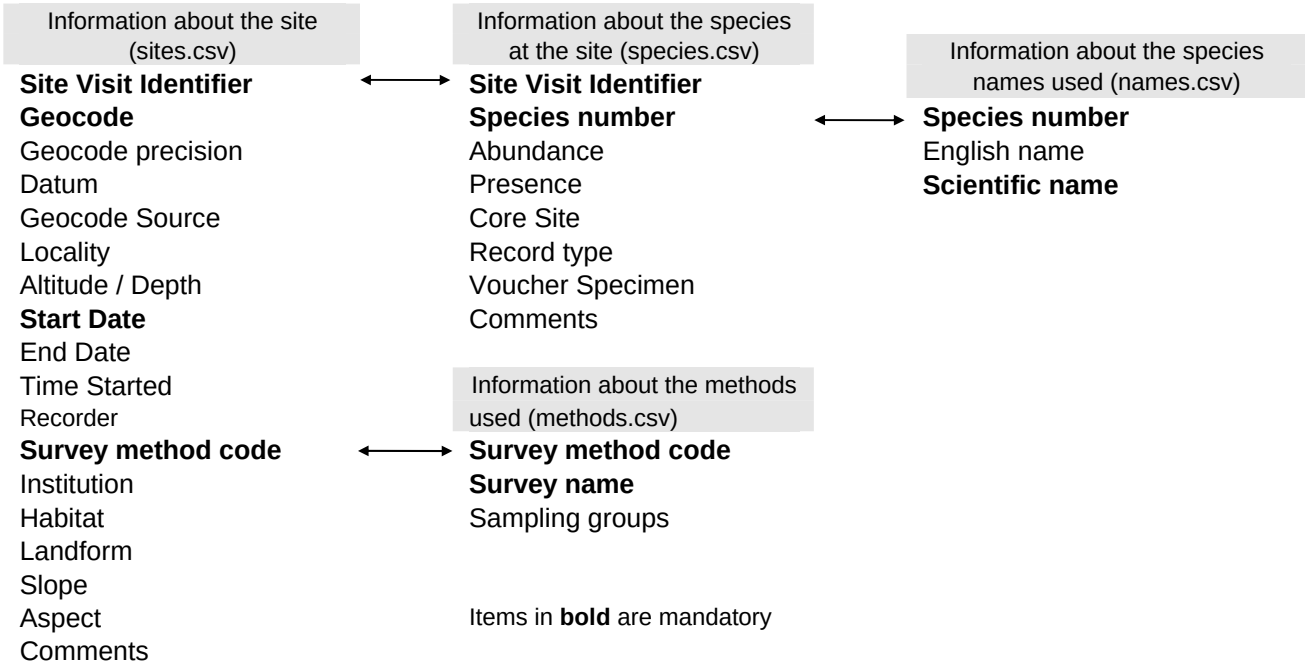
Scientific name	Common name	Latitude	Longitude	Precision	Start date	End date
Xanthomyza phrygia	Regent Honeyeater	36 15 06	145 12 05	25	12/6/2003	14/6/2003
Acacia recurva	Recurved Wattle	36 16 01	145 09 04	1000	15/12/2003	

All data are geographic (dms) in GDA 94 datum

Attachment 3

Possible format for the detailed survey data

File 1: Information about the site (**sites.csv**)
File 2: Information about the species at the site (**species.csv**)
File 3: Information about the species names used (**names.csv**)
File 4: Information about the survey methods (**methods.csv**)



FIELDs in **bold** are mandatory. *WIDTH* is the maximum width including decimal points. *DEC* is the number of decimal places.

File 1: Information about the site/visit, called ***sites.csv***

FIELD	*TYPE*	*WIDTH*	*DEC*	*COMMENT*	*ALLOWABLE VALUES*
Site/visit Identifier	Alphanumeric	10		Unique identifier for a site/visit	
Geocode				Centre point of site, ***either*** Lat/Long or AMG/MGA:	
**** Latitude**	Numeric	10	6	Decimal degrees, eg –35.500000, South is negative	
Longitude	Numeric	10	6	Decimal degrees, eg 145.500000	
**** Zone**	Numeric			AMG/MGA Zone	
Easting	Numeric	6		AMG/MGA Easting metres	
Northing	Numeric	7		AMG/MGA Northing metres	
Geocode precision	Alphanumeric	6		Error radius around the nominated geocode, in metres. Use these nominal values for Lat/Long cells: 1°≅50000m; 10'≅1000m; 5'≅5000m; 1'≅1000m, 10"≅150m, 1"≅15m.	
Datum	Alphanumeric	6		Datum of the geocode: Australian 66/84 (AMG) or GDA 94=WGS84 (MGA)	Aus 66, Aus 84, GDA 94, WGS 84
Geocode source	Alphanumeric	15		The way in which the geocode was determined, read from map or global positioning system (GPS) or Automatically generated from a stated locality.	Map, GPS, Automatic, Other
Locality	Alphanumeric	255		Plain language description of the locality. A good form is distance and direction from a named placed	e.g. 25 km NW of Gulargambone
Altitude/ depth	Alphanumeric	6		Altitude of the site, in metres above or below sea level (-)	
Start Date				The date the site visit started. Start/end datas should be no more than 31 days apart.	
Year	Numeric	4		Year	
Month	Numeric	2		Month (number), may be zero	0 - 12
Day	Numeric	2		Day, may be zero	0 - 31
End Date				Date the site visit ended, leave blank if visit on one day. Start/end datas should be no more than 31 days apart.	
Year	Numeric	4		Year	
Month	Numeric	2		Month (number), may be zero	0 - 12
Day	Numeric	2		Day of survey, may be zero	0 - 31
Time started	Numeric	4		Time of the day the site visit started, hour and minute using 24 hour clock	0 - 2359
Survey method	Alphanumeric	4		Type of Survey – code	
Survey effort	Alphanumeric	8	3	Effort	
Recorder	Alphanumeric	65		Name of the person who recorded the data.	
Institution	Alphanumeric	65		Institution name or standard code	

FIELD	*TYPE*	*WIDTH*	*DEC*	*COMMENT*	*ALLOWABLE VALUES*
Habitat	Alphanumeric	120		Habitat/vegetation/ecosystem type	
Landform	Alphanumeric	20		Position in landscape:	Ridge, Simple Slope, Upper Slope, Mid Slope, Lower Slope, Open Depression, Closed Depression, Flat, Crest, Hillock, Aquatic (running water, still water), Marine, Island, Beach, Inter-tidal, Benthic
Slope	Alphanumeric	30		Degrees from horizontal: 0 to 90	0 - 90 **or** Level (<1°) Very Gently Inclined (1°-3°) Gently Inclined (3°-10°) Moderately Inclined (10°-23°) Steep (23°-37°) Very Steep (37-60°) Precipitous (60°-80°) Cliff (80°-90°)
Aspect	Alphanumeric	3		Degrees from north *or* cardinal points	0-359 *or* N, NE, E, SE, S, SW, W, NW
Comments	Alphanumeric	255		Any special comments, including on weather, type/frequency of survey, plot size, etc.	

** Geocode may be either Latitude/Longitude or AMG/MGA, but should all be the same in the database.

The formula for converting degrees/minutes./seconds to decimal degrees is:

Degrees + ((Minutes * 60 + Seconds) / 3600)

Latitudes for Australia are negative and should be preceded by a minus.

File 2: Information about the species is recorded in ***species.csv***

FIELD	*TYPE*	*WIDTH*	*DEC*	*COMMENT*	*ALLOWABLE VALUES*
Site/visit identifier	Alphanumeric	10		Unique visit/survey number	
Taxon_id	Alphanumeric	7		Unique species (taxon) code.	
Abundance	Numeric	5		Number of taxa counted or trapped; for presence only leave blank	
Presence	Boolean	1		Recording of an Absence for a species should only be for where a specific search has been conducted for that species	True/False
Core site	Alphanumeric	25		Whether the site is particularly important, i.e. Breeding sites for birds, turtles; Roosting sites for shorebirds and bats	Breeding, Roosting
Record type	Alphanumeric	15		The type of record: Survey, Incidental, Specimen	Survey, Incidental, Specimen
Voucher Specimen	Alphanumeric	25		Cross reference to Institution and number of voucher specimen, use standard institution code and registration number	eg: MV: B657238
Comments	Alphanumeric	255		Comments may include reliability of identification, etc.	

File 3. Information about the name of the species is recorded in ***names.csv***

FIELD	*TYPE*	*WIDTH*	*DEC*	*COMMENT*	*ALLOWABLE VALUES*
Taxon_id	Alphanumeric	7		Unique species (taxon) code	
English name	Alphanumeric	100		English	
Scientific name	Alphanumeric	100		Full scientific name: genus species subspecies or variety	

File 4. Information about the site/visit survey method is recorded in ***methods.csv***
(NB. More details of methods - e.g. plot size, sampling strategy/frequency etc. Should be recorded in the Metadata)

FIELD	*TYPE*	*WIDTH*	*DEC*	*COMMENT*	*ALLOWABLE VALUES*
Survey method	Alphanumeric	10		Survey method code	
Survey name	Alphanumeric	25	0	Name of the type of Survey, e.g. Bird count, Turtle census, Elliot Traps	
Sampling Groups	Alphanumeric	5		The sampling groups this method surveys (see below).	

Recommended sampling groups:

Diurnal birds	Bats	Freshwater invertebrate	Marine invertebrates
Birds	Small ground mammals	Fish	Marine vertebrates
Large forest owls	Large visible mammals	Terrestrial invertebrate	Fungi
Nocturnal birds	Amphibians	Flora	Non-vascular plants
Arboreal mammals	Reptiles	Algae	

These are examples only, other groups may be defined depending on the survey design. Species may be members of a number of sampling group

ATTACHMENT 3

NT ENVIRONMENTAL IMPACT ASSESSMENT GUIDE:

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

PURPOSE

The Northern Territory Government's objective for managing greenhouse gas emissions from new and expanding operations is to minimise emissions to a level that is as low as practicable. This will help fulfil the objective of minimising greenhouse gas emissions from the NT into the future.

The Northern Territory Government's objective for considering future climate change in the assessment process is to ensure projects and developments are planned taking climate change science and projections into account, to minimise future environmental, social and economic costs and take advantage of any opportunities.

This Guide aims to assist proponents in providing the information needed by the Department of Natural Resources, Environment, the Arts and Sport (NRETAS) to assess the impact of greenhouse gas emissions from proposed projects and assess other potential impacts from proposed projects under projected future climatic conditions under the *Northern Territory Environmental Assessment Act 1994*.

GUIDANCE

Emissions estimates

Note that the Australian Government is establishing a national greenhouse gas emissions trading system, which may have implications for some proponents. More information on a national emissions trading scheme is available at
http://www.climatechange.gov.au/emissionstrading/index.html

Proponents should detail the following in their environmental impact assessment documentation:

1. An estimate of the greenhouse gas emissions for the construction and operation phases:

   (a) in absolute and carbon dioxide equivalent figures (refer to the Glossary in this Guide) for each year of the project;
   (b) identified on a gas by gas basis; and
   (c) by source (including on site and upstream sources such as emissions arising from land clearing and the production and supply of energy to the site).

Emissions estimates are to be calculated using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee or another national or internationally agreed methodology. See http://www.climatechange.gov.au/workbook/index.html for access to the National Greenhouse Accounts Factors which may assist.

For emissions from clearing of vegetation, emissions estimates are to be calculated using the National Carbon Accounting System, or another nationally recognised methodology. For more information see http://www.climatechange.gov.au/ncas/index.html

2. Details of the project lifecycle greenhouse gas emissions and the greenhouse gas efficiency of the proposed project (per unit and/or other agreed performance indicators).

Lifecycle emissions and greenhouse gas efficiency should be compared with similar technologies producing similar products.

To provide an understanding of the broader impact of the proposal, proponents are encouraged to place the estimated greenhouse gas emissions from the proposal into a national and global context. Information on Australia's national emissions profile can be obtained from the Department of Climate Change at http://www.climatechange.gov.au/inventory/2005/index.html. International emissions can be seen at the United Nations Framework Convention on Climate Change (UNFCCC) website at http://unfccc.int/ghg_emissions_data/items/3800.php

Measures to minimise greenhouse gas emissions

Proponents must demonstrate consideration of a wide range of options and indicate the intended measures and efficient technologies to be adopted to minimise total greenhouse gas emissions from the proposed project, including:

(a) identifying energy conservation measures, opportunities for improving energy efficiency and ways to reduce fugitive emissions where applicable;
(b) indicating where potential savings in greenhouse gas emissions can be made through the use of renewable energy sources, taking into account fossil fuels used for supplementary power generation; and
(c) whilst recognising the likely commencement of an emissions trading scheme in 2010, their commitment to offsetting greenhouse gas emissions.

The design measures to maximise efficiency and minimise emissions should represent best practice at the time of seeking project approval.

Proponents are to advise whether they will join the Commonwealth Government's Greenhouse Challenge program. For more information on the program see http://www.climatechange.gov.au/challenge/index.html

Offsets

Emission offsets include activities that remove carbon from the atmosphere or reduce the greenhouse gas intensity (output per unit product) from current or future activities. No Australian standards for offsets currently exist, although the Australian Government has committed to the development of an Australian standard for offsets by the end of 2008. The Australian Government does currently approve Greenhouse Friendly carbon credits under the Greenhouse Friendly initiative, more information about which can be found at http://www.greenhouse.gov.au/greenhousefriendly

Measures that offset emissions within the NT are strongly encouraged, and NRETAS staff can discuss possible options with proponents. Proposed emissions offsets projects should include an estimate of greenhouse gas emissions savings that will be achieved through implementation.

Emissions monitoring and reporting

Consistent with the principles of continuous improvement, a program is to be outlined in the proponent's Environmental Management Plan which includes ongoing monitoring, investigation, review and reporting of greenhouse gas emissions and abatement measures.

The Australian Government is developing a nationally consistent framework for greenhouse and energy reporting by industry. Projects with significant emissions may be required to report their emissions under the National Greenhouse and Energy Reporting Act 2007. Data reported through the system will underpin the National Emissions Trading Scheme. For more information see http://www.climatechange.gov.au/reporting/index.html

Impacts of climate change

Climate change is projected to result in changes to sea level, land and sea temperatures, cyclone intensity, frequency of fire weather, and frequency of extreme weather events including storms, drought and flood.

Proponents should discuss how projected climate change has been taken into account in planning the proposal, and how climate change is expected to affect the proposal over its stated lifetime. Proponents should discuss how climate change-related risks (for example, risk of failure of project infrastructure during potential extreme weather events) will be managed.

Potential impacts of climate change on the surrounding environment including water, land, biodiversity and ecosystems, coastal zones, and the social environment should also be taken into account in proposal planning.

In assessing climate change risk, proponents should be guided by recent projections published by organisations such as the CSIRO, the Bureau of Meteorology (BoM), and the Intergovernmental Panel on Climate Change. For the latest CSIRO and BoM projections for Australia, see: http://www.climatechangeinaustralia.gov.au

GLOSSARY OF GREENHOUSE TERMS

Abatement: Limiting, abating, avoiding or sequestering greenhouse gas emissions through source reduction, fuel displacement or switching, carbon stabilising techniques or sink enhancement.

Absolute emissions: Refers to the total emissions of greenhouse gases expressed in terms of the actual mass of each individual gas emitted over a specified time period.

Best Practice: A best practice is a process, technique, or use of technology, equipment or resource that has a proven record of success in minimising energy use and greenhouse gas emissions. A commitment to use best practice is a commitment to use all available knowledge and technology to ensure that greenhouse gas emissions are minimised.

Carbon Dioxide Equivalent: A unit of greenhouse gas emissions calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential. This enables emissions of different gases to be added together and compared with carbon dioxide (see Table 1 below).

Commonwealth Government's Greenhouse Challenge program: A cooperative effort by industry and the Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. See: http://www.climatechange.gov.au/challenge/index.html

Greenhouse Gases: Table 1 lists the greenhouse gases proponents are required to report on.

Global Warming Potential (GWP): The warming potential of a gas, compared to that for carbon dioxide. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. Refer Table 1.

Project Lifecycle Greenhouse Gas Emissions: Those greenhouse gas emissions measured cumulatively over a defined period. Typically this period is from the point of extraction of the raw materials to either the beginning of the consumer phase of a product or the final disposal or recycling stage of a product, depending on its nature. Proponents should justify their choice of the defined period.

National Greenhouse Gas Inventory Committee: A committee comprising representatives of the Commonwealth, State and Territory Governments that oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia.

Sequestration: Removal of greenhouse gases from the atmosphere by vegetation or technological measures. Sequestration is not yet precisely defined for the purposes of recognised trading or offset schemes. Accordingly, NRETAS will take a common sense approach on a case by case basis in the interim. To assist proponents, NRETAS regards sequestration as a process that results in the isolation of carbon dioxide from the atmosphere for a period which is significant in terms of influencing the global warming effect.

Source: Any process or activity that releases a greenhouse gas into the atmosphere.

Table 1: Greenhouse gases and respective Global Warming Potential (GWP) factors

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous oxide (N_2O)	310
Perfluorocarbons (CF_x)	6,500 – 9,200
Hydrofluorocarbons (HFCs)	140 - 11,700
Sulphur hexafluoride (SF_6)	23,900

Greenhouse gas emissions expressed in carbon dioxide equivalent (CO_2-e) are calculated by multiplying the actual mass of emissions for each greenhouse gas by its respective GWP factor. GWP factors listed are those published by the International Panel on Climate Change in its 4th Assessment Report, 2007, see http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Print_Ch02.pdf

ATTACHMENT 4

Australian Government

Department of the Environment, Water, Heritage and the Arts

Guidelines for the development of an Environmental Management Plan

Ichthys offshore and onshore processing facilities and subsea pipeline

(EPBC 2008/4208)

Prepared by:
Commonwealth and Territories Section
Environment Assessment Branch
Approvals and Wildlife Division
Department of Environment, Water, Heritage and the Arts

September 2008

Table of contents

1 General Comments

This framework has been developed to assist Inpex Browse LTD to prepare an environmental management plan/s (EMP) to form part of the environmental impact statement for the Ichthys offshore and onshore processing facilities and subsea pipeline (EPBC 2008/4208). It should be used as a guide only.

Inpex Browse LTD should liaise with the project officer during the development of any EMPs.

1.1 Presentation and cross-referencing

Ensure that the format of the EMP is consistent and easy to follow. Where it refers to material in previously submitted documents, such as the referral information, include clear cross-references (e.g. 'See environmental impact statement, Section 2.9, pages 25–27.'). Use tables, diagrams and maps where inclusion would provide a better understanding and implementation of the EMP. Link all tables, diagrams and maps into the text through cross-referencing.

1.2 Definitive Commitments

To ensure readability, write clearly and avoid long sentences with complex clauses. Use the term 'will' rather than 'should' for commitments to carry out management actions. Avoid ambiguities such as 'where possible', 'as required', 'to the greatest extent possible' and the use of jargon. Clearly explain any technical terms or acronyms that need to be used, or define them in a glossary. All commitments must be written in a manner that is clearly auditable.

It is also important that there are no conflicting strategies or statements within the EMP. Carefully read the management commitments that are being made in the plan before submitting it.

2 Overall Management Framework

The approach to preparation of the management plan detailed in the following sections is presented in a prescriptive format that provides for the setting of clear actions, specific performance targets and monitoring procedures. It is recognised, however, that management of certain matters of national environmental significance (NES) is not fully predictable. Accordingly, management actions to be taken may need to be flexible and sufficiently adaptable in recognition of issues such as weather perturbations, limited or absence of suitable baseline data, a lack of existing scientific knowledge of the issue at hand, uncertainties over the influence of other external impacts not associated with the project, or particular characteristics or peculiarities of the matter requiring management. The proponent may need, in many circumstances, to implement an innovative and adaptive approach to the preparation of a

management plan that, particularly in the early period of a management and monitoring program, may not be able to be clearly defined within a prescriptive plan. For example, it may be appropriate to establish an expert management committee approach with an aim to enable a flexible on-going review process to management and ensure rapid response to external factors. However, should such an approach be proposed, it will need to be fully transparent and auditable with performance indicators and corrective actions. An example of management measures from an adaptive management plan can be viewed in Section 3 of these guidelines.

3 Content of the Management Plan:

3.1 Introduction

The management plan should include the following:

- brief project description
- brief description description of existing environment and relevant matter(s) of NES
- brief description of potential impacts on protected matters
- management strategies
- management actions
  - management measures
  - monitoring requirements
  - performance indicators
  - corrective actions
  - responsibilities
  - timing
- auditing/verification requirements and reporting
- EMP review

3.2 Description of Proposal

This section should only be a paragraph describing the whole project, specifically mentioning the part of the project that impacts on the relevant matter/s of NES. Maps should be used to show the location of the proposal in relation to the surrounding areas. Reference can be given to the EIS if it provides a more thorough description of the proposal.

3.3 Existing Environment

This section should just be a summary of relevant information concerning the NES matters. If there are uncertainties in describing the existing environment, these must be stated. Reference can be given to the EIS if it provides a more thorough description of the proposal

3.4 Potential Impacts

This section of the plan should focus on identifying the potential impacts of the project on the applicable matters of NES. It should be brief, succinct and should cover:

- the relevant impacts of the proposal,
- the nature and extent of the potential short-term and long-term effect, and
- any uncertainties regarding the predictions.

Impacts from relevant stages of the action (possibly including predictions related to future development of the site) should be incorporated into this section. It may be necessary to divide the potential impacts into subsections, such as a subsection for the Commonwealth marine environment and listed threatened and migratory species.

3.5 Management Strategies

Environmental management strategies should be developed to target each of the potential impacts identified. Strategies are required to provide overall guidance on the intent of the management plan and to define the desired outcomes of the management plan and establish an overall benchmark and performance goals. Strategies must be developed for each of the impacts.

3.6 Management Actions

Each management strategy forms the basis for a specific management action. These actions are best presented in table format, as shown in the example below. The terms in the table are explained in the sections that follow. Management actions should incorporate the following elements: management measures, monitoring requirements, performance indicators and corrective actions.

Example 1: Management actions table

Strategy: Where direct impact is unavoidable, reduce impact on threatened species (Gouldian Finch) during construction of the pipeline.			
		Timing	**Responsibility**
Management measures	In priority habitat: • Align the corridor to avoid physical disturbance to confirmed breeding trees/sites especially hollow bearing trees.	Prior to construction	Company Environment Officer
	• Establish a 100m 'no-go' zone around breeding sites to discourage inadvertent or deliberate disturbance to nesting sites.	Prior to construction	

Strategy: Where direct impact is unavoidable, reduce impact on threatened species (Gouldian Finch) during construction of the pipeline.			
		Timing	**Responsibility**
	• Conduct supplementary seeding in Area A in accordance with advice from relevant experts.	Post construction	
	In priority and marginal habitat: • No drawing water from dams/impoundments will be permitted.	During construction	
	• Rehabilitate the easement with native seeding grasses that are preferred by the Gouldian Finch, as advised by relevant experts.	Post construction	
Monitoring requirements	• Mapping of suitable habitat for the Gouldian Finch in the northern end of the pipeline and provide to DEH	6 months prior to construction. Annually after construction.	Company Environment Officer
	• Observations to ensure current tree hollows are retained, and supply of hollows is sufficient for population.	Weekly during construction. Monthy during first six months of operation. Annually after first 6 months of operation.	
Performance indicators	• No impact to areas of preferred habitat. • No loss of tree hollows.		Company Environment Officer
Corrective actions	• Refine alignment where outside proposed corridor.	Within 6 months of identifying that performance indicators have not been met and before construction	Company Environment Officer
	• Artificial tree hollows to be affixed to trees in areas of limited supply.	Within one month of identifying loss of tree hollow.	

NB: The measures and actions described above are indicative only and have not been endorsed as necessarily suitable for minimising or mitigating impacts on the Gouldian Finch or other listed threatened species.

3.6.1 Management measures

Management measures should be designed for each of the strategies. These are the actions that need to be undertaken to prevent or mitigate impacts. A number of management measures may be required to achieve one strategy.

3.6.2 Monitoring requirements

A monitoring program should be developed for management actions. This will establish whether there have been any impacts from the proposed activities, or for determining the effectiveness of mitigation measures. It will also determine whether the environmental strategies are being complied with, and whether any environmental

incidents occur. Conditions of approval often include monitoring, and specify its timing and frequency.

Monitoring should be designed to provide ongoing feedback for the management of the proposals environmental impacts, and the results should feed back into the management plan review process.

3.6.3 Performance indicators

Performance indicators should be used to verify the efficacy of a management plan and will indicate the success or otherwise of particular management measures. The indicators need to be clear and concise, and must specify the outcome to be achieved.

3.6.4 Corrective actions

Corrective actions need to be outlined to demonstrate that appropriate methods will be implemented if there is a deviation from a management measure, or if a management strategy or performance indicator is not achieved. The corrective action must be designed to prevent or mitigate any further impacts and should ensure that management strategies are achieved.

3.6.5 Responsibilities

There should be a clear statement nominating the person(s)/agency(s) responsible for funding the particular management actions, ensuring that particular management actions are undertaken and that the strategies are achieved. This includes identification of the person's position within the relevant company or authority, or their status as separate contract personnel. Ultimate responsibility, if there is a failure in management, should be defined within the management measures.

Official agreement must be obtained where the proponent proposes that a third party (e.g. state government) will take responsibility for management actions.

3.6.6 Timing

Timing needs to be specified for each of the management measures, and monitoring and reporting requirements

3.6.7 Training

Staff and contractors should undergo environmental awareness training to familiarise themselves with their responsibilities for implementing the management plan. Details of this training should be mentioned in the plan.

3.6.8 Adaptive Management Example

As an alternative to the prescriptive form of management plan demonstrated above, adaptive management plans may use a system of triggers and actions. An example of adaptive management is demonstrated in the following table.

Example 2: Adaptive management triggers and actions table

Strategy: Establish criteria that will trigger a requirement for further mitigation measures to maintain suitable habitat for the Green and Gold Bell Frog				
Values	**Triggers**	**Actions**	**Responsibility**	**Timing**
Green and Gold Bell Frog	**Alert Triggers** 1. No record of breeding activity during an annual monitoring program Or 2. Any clearly unusual results observed during the course of a summer monitoring program, such as markedly low numbers of frogs at a site where they previously had not been found.	a. Consult with recognised Green and Gold Bell Frog experts to ascertain likely reasons for this. b. Incorporate relevant management recommendations into the Green and Gold Bell Frog Management Plan.	Environmental Manager	Yearly
	Action Triggers 1. A decline of ≥ 10% in the number of individuals recorded during summer surveys at the project site over three successive years. Or 2. An overall decline of >25% in annual average number of individuals recorded during summer surveys at the project site over a three year period. Or 3. No record of breeding activity over three successive years.	a. Review and revise the Green and Gold Bell Frog Management Plan and submit for DEH approval. b. Select a minimum of two suitable non-operational ponds, plus drains, and manage these specifically for the Green and Gold Bell Frog.	Environmental Manager	Every three years

NB: The measures and actions described above are indicative only and have not been endorsed as necessarily suitable for minimising or mitigating impacts on the Green and Gold Bell Frog or other listed threatened species.

3.7 Auditing/verification requirements and reporting

Auditing or some other form of verification, and reporting of results, will ensure that the objectives of the management plan are being achieved. Plans should include a reporting and reviewing mechanism as well as documentation standards to demonstrate compliance. Approval conditions may include the provision of reports or mandatory audits of conditions, including the plans required by conditions.

When reporting or auditing is mandatory, the management plan must specify this and outline how and when this will be undertaken. When auditing is required on a regular basis, timing and responsibility for audits must be clearly set out in the management plan. While audits may take place internally, in some cases, appropriately accredited external auditors may be required.

The management plan should provide a clear summary of all reporting and review requirements and the timing for submission. Note, the conditions of approval may also require the submission of an annual certificate stating compliance with the approval conditions.

3.8 Contingency arrangements

Although the management measures may cover most potential impacts, contingency arrangements are required in the event that management measures fail to mitigate or minimise impacts on matters of NES. This may result from human-induced (e.g. fire, oil spill) or natural extreme events (e.g. cyclone).

Contingency arrangements should not be confused with corrective actions, which are implemented when monitoring finds that current management measures are not effective in mitigating impacts during daily operations, or when there has been non-conformance with the strategies of the management plan.

3.9 Management plan review

The management plan must be reviewed periodically to determine its effectiveness in protecting the matter(s) of NES. This will also allow revision of the plan to reflect knowledge gained during the life of the project. A timeline for reviewing the management plan must be established. Reviewed or revised management plans must be approved by the decision maker prior to being implemented.

4 Bibliography

EPA (ACT), 2004, *Guidelines for preparation of an environment management plan*, September 2004, Canberra.

Commonwealth of Australia, 2003, *Environmental management guide for Australia's aid program 2003*, AusAID, Canberra.

Environment Australia, 2003, *ESD reporting guidelines*, viewed 16 September 2008, http://www.environment.gov.au/epbc/publications/esd-guidelines.html

Environmental Protection Agency (Qld), 2003, *Guideline — environmental impact assessment: preparing environmental management plans*, 03/03.