

*Appendix A*

## **PER GUIDELINES**

**PART B**

**GUIDELINES FOR PREPARATION OF A  
PUBLIC ENVIRONMENTAL REPORT**

**Aussie Prawns Pty Ltd  
Aquaculture Development  
Section 1880 Hundred of Ayers**

**January 2005**

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# 1 Purpose and Legislative Requirements

These Guidelines have been developed to assist Aussie Prawns Pty Ltd in preparing a Public Environmental Report (PER) for the proposed Aussie Prawns Aquaculture Development at Section 1880, Hundred of Ayers in accordance with Clause 8 of the Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1982)* of the Northern Territory.

Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1982)* of the Northern Territory state that the Minister will specify the following in the Guidelines:

- Matters relating to the environment which the proponent shall deal with;
- Timeframe for submitting the report;
- Number of copies of the report to be provided to minister/other agencies; and
- Newspapers in which and on occasions when the proponent will publish a notice.

These guidelines address the environmental issues to be considered in the PER. If guidance on the structure of the document is required, contact the nominated project officer.

The PER should contain sufficient information to enable understanding and assessment of the scope and environmental implications of the proposal. The PER should clearly identify the main environmental impacts associated with the development and should contain a management strategy to minimise these impacts.

Information should be presented in a concise format, using maps, overlays, tables and diagrams where appropriate to clarify the text.

## 2 The Proposal

### 2.1 Description of Proposal

This section should describe the development proposal to allow a detailed understanding of infrastructure design and engineering and all stages of construction, operation and management of the Scheme and include relevant plans, photos and maps. Aspects to be covered include:

- The objectives, benefits and justification for the project. The purpose of this is to place the proposal in the local and regional context;
- Project schedule, including staging of development and the timing of the stages;
- Location and design criteria for each component (including, but not limited to elements such as ponds, tanks, buildings, roads, parking, stormwater drainage, sewerage, etc.) of the project including design limitations imposed by site characteristics;
- Land requirements, land tenure, acquisition requirements (permits, rezoning and Native Title), and the tenures under which the project would be held including details of relevant legislative processes required to grant proposed tenure;

- Infrastructure requirements and specifications (permanent and temporary) and ancillary activities (eg storage areas etc);
- Power, potable water supply, road access requirements and associated corridors;
- Staffing and servicing requirements, hours of operation and security of the site;
- The layout of the proposal, including all elements such as processing facility, storage tanks, buildings, roads, pump stations, production facilities, treatment facilities etc;
- Water supply (including freshwater) and management requirements, water quality maintenance. Provide detailed specifications on any proposed storages including construction methods, sources of fill, storage capacity, impacts of storage on the catchment, overflow design and capacity, spillway stabilisation and risk assessment in the event of a Probable Maximum Flood;
- Description of the processes of production, treatment, discharge, processing, including all inputs and outputs of the process;
- Construction timing, methods, equipment and materials (types, sources and quantities) used and shift patterns;
- Identification of chemicals to be stored on site, including quantities;
- Methods for storage, handling, containment and emergency management of chemicals and other hazardous substances (including fuel, diseased stock);
- Outline of sludge treatment practices, including harvesting, conditioning and disposal. Provide details of all monitoring programs;
- Proposed environmental, safety and emergency management arrangements including risk assessments, contingency and response plans;
- Landscaping proposals;
- Construction practices and management to minimise the potential for aggravating existing biting insect populations;
- Species to be cultured, sources of juveniles/broodstock and farming techniques. Include information on feeding, rearing techniques, hygiene and quarantine requirements, stocking rates, pond inputs, harvesting and all monitoring programs to be undertaken;
- Expected life of the project and rehabilitation commitments and timetables (for both temporary and permanent facilities) including waste management, pollution control, storage facilities, land stabilisation and rehabilitation plans (where appropriate) and rehabilitation of potential mosquito breeding sites; and
- Ongoing management, maintenance and administrative requirements.

### **3 ALTERNATIVES**

Alternative proposals, which may still allow the objectives of the project to be met, should be discussed, detailing reasons for the selection and rejection of particular options. The short, medium and long-term potential beneficial and adverse impacts of each of the options should be considered.

Alternatives to be discussed should include:

- Not proceeding with the proposal;
- alternative locations /layout for the whole proposal;
- alternative locations /layout for components of the proposal; and

- alternative environmental management techniques including, but not limited to, alternative methods for waste treatment and discharge, recirculation and zero discharge.

## **4 EXISTING ENVIRONMENT, POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT**

### **4.1 Preliminary**

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 over an extended period. Control areas not impacted by the project should be included in proposed studies, and long-term monitoring locations should be established.

Detailed information is required on the following for each aspect of the project. Each element should be described, the impacts or potential impacts of the project considered. The safeguards, management and monitoring strategies that will be used to minimise the impacts of construction and operation of the proposal should be outlined.

### **4.2 Regional Setting**

Describe the project area, in terms of broad climatic zones, land terrain types, regional population centres, land use, land sensitivities and Aboriginal relationships to the land including cultural values.

#### **4.2.1 Landform**

##### *Existing Environment*

- Describe existing terrestrial and aquatic flora and fauna species, communities and habitats present that may be affected by the proposal. In particular, provide information on any areas of mangroves or terrestrial vegetation likely to be disturbed. Discuss how the project will impact flora and fauna.
- Detail sites of significance including archaeological, historical, cultural, Aboriginal, biological and recreational sites.
- Identify areas of Potential Acid Sulphate Soils and Acid Sulphate Soils.

##### *Potential Impacts*

- Discuss extent and impact of proposed clearing, and disposal of vegetation, including terrestrial and mangroves. Discuss destruction or disruption of habitat areas of flora and fauna communities, and changes to ecological processes, associated with areas of clearing.
- Discuss introduction and spread of weed species, particularly through construction or earthmoving equipment.
- Disturbance of potential acid sulphate soils and potential for acid leachate formation.
- Changes in community structure of mangrove species (in addition to other salt intolerant vegetation) via the alteration of salinity gradients as a result of dam construction and changes in freshwater availability.

- Discuss impact of project on archaeological, historical, cultural and Aboriginal sites.

#### *Proposed Management and Monitoring*

- Outline any preventative, remediation or rehabilitation measures undertaken to minimise the impacts associated with land clearing
- Outline measures to address landform limitations including receiving environment sensitivities, acid sulfate soils and effects on mangroves.
- Outline measures to be used to demonstrate the land capability for this type of development.
- Detail erosion and sediment control management of the site.
- Identify precautions to minimise weed introduction and spread, e.g. wash down of equipment, and develop an ongoing weed management program.
- Outline measures to mitigate impact to archaeological, historical, cultural and Aboriginal sites with consideration to the Cultural Heritage Management Report produced by the Office of Environment and Heritage (Appendix 1)

### **4.2.2 Water**

#### *Existing Environment*

- Detail the water balance for the proposal – the total amount of water used and disposed of during the process.
- Discuss existing hydrology, including catchment area, surface and groundwater flow patterns, water table depths and regimes, flood flows and areas of seasonal inundation, tidal influences and levels of tidal fluctuation, and existing water quality of surrounding watercourses.
- Describe and model the hydrodynamics adjacent to development area with respect to impacts to receiving waters from the discharge of waste water.

#### *Potential Impacts*

- Provide a characterisation of all wastewater produced by the development.
- Discuss how the project will impact hydrology.
- Undertake a risk assessment of the development on the adjacent aquatic system from sources of wastewater and run off (including spills).
- Discuss preferred regime for treatment and disposal of wastewater (including selection criteria) and describe the potential for impact on receiving environment.

#### *Proposed Management and Monitoring*

- Detail management objectives with respect to impacts on receiving waters such as depletion of dissolved oxygen levels, eutrophication, altered gas exchange regimes of mangroves etc. Discuss any preventative measures.
- Discuss all monitoring procedures for water quality parameters, plans of the uptake and discharge points, and address maintenance of water quality within the farm.
- Outline stormwater management techniques, including overflows from production and treatment ponds and from sludge treatment areas.
- Outline biosecurity measures to prevent the onset of disease within the farm and its spread to or from natural fisheries. Include description of procedures to

contain all production wastes on site for a considerable timeframe, treatment methods, and how treated wastes can be safely disposed of.

- Outline measures to prevent escape of prawns from the farm to the natural environment.
- Outline spill containment and management measures.

### **4.2.3 Air Quality and Noise**

#### *Existing Environment*

- Describe background air quality and noise levels.

#### *Potential Impacts*

- Identify likely noise levels, timing and duration and comparison to current levels.
- Identify the potential for odour generation from processing, storage of products and waste.
- If the operation will generate emissions to air (including greenhouse gases), these should be identified and quantified, and a description should be provided indicating techniques to minimise these.
- Greenhouse gas emissions should be predicted for on-site sources and the upstream supply of energy to the site. Please refer to the Greenhouse Gas Emissions EIA Guidelines (Appendix 2).

#### *Proposed Management and Monitoring*

- Outline dust suppression and monitoring techniques, particularly during construction.
- Outline any proposed noise management measures.
- Outline any proposed odour management measures.

### **4.2.4 Waste Management**

- Identify and describe all sources of waste.
- Quantify and characterise all waste products.
- Outline waste storage and disposal options.
- Provide a waste management plan including reduction, reuse, storage, transport and disposal. Include a certification of acceptance by proposed disposal site of waste products.
- Impacts on the mangroves and other estuarine biota caused by waste water discharges. Consider alternatives to using the mangrove system as a biofilter and for polishing effluent.

### **4.2.5 Transport**

- Outline the location, method and routes for transportation of equipment, raw materials and product during construction and operation.
- Describe how the project will, or has the potential to, impact on transport infrastructure during construction and operational phases. In addition, describe possible transport impacts as a result of the proposal including issues such as dust and road traffic noise.



#### **4.2.6 Pests and Diseases**

- The impact of existing biting insect populations in the area on the construction work force and prawn farm work force.
- The impact of the development on mosquito and other biting insect habitats which lead to the creation of breeding sites by impounding tidal water, restricting tidal regimes, allowing increased tidal inundation of low lying areas, restricting or impeding fresh water drainage, lowering water tables in existing wetlands and any other ecological changes that can create or aggravate existing mosquito breeding sites.
- Outline measures to prevent the onset of disease within the farm and its spread to or from natural fisheries.

### **5 PROJECT ENVIRONMENTAL MANAGEMENT**

A summary table listing potential impacts, environmental management practices and safeguards, monitoring and management methods, and commitments, cross-referenced to the text of the report should be provided, together with the outline of an Environmental Management Plan (EMP). An EMP should:

- Provide details of proposed measures to minimise adverse impacts and the effectiveness of these safeguards.
- Ensure that safeguards are being effectively applied.
- Enable remedial action for any impacts which are not originally predicted.
- Measure the differences between predicted and actual impacts (monitoring); and provide for the periodic review of the management plan itself.

#### **5.1 Resourcing and Policies**

Information is to be provided on strategic matters relating to environmental management and should include:

- staffing arrangements to ensure that the measures described in the report will be carried out effectively;
- procedures and instructions to employees on minimising unnecessary environmental impacts; and
- a staff induction and education program to ensure an informed response to construction and operational environmental concerns.

#### **5.2 Monitoring and Reporting Strategies**

Specific programs of monitoring or measuring the success of the Project's environmental management should be outlined. These should be covered in greater detail in the Environmental Management Plan.

## **6 HEALTH AND SAFETY**

Health and Safety issues pertaining to the design, construction and operational phases of the project, and the transport of construction materials, should be investigated. This should address issues concerning employees visiting the site and members of the public.

- Discuss issues relating to provision of emergency first aid treatment and transport of sick or injured persons to the nearest appropriate medical facility.
- Prepare a management and administration plan outlining strategies and procedures in the event of an emergency.
- Discuss issues relating to the minimisation of mosquito breeding habitat, and protection of the workforce from mosquito and biting midges. Medical Entomology Branch should be consulted during the design phase of this development.

## **7 RISK ASSESSMENT AND EMERGENCY MANAGEMENT**

### **7.1 Risk Assessment**

While the PER must deal comprehensively with on site risks, it is suggested that external risks to the project also be considered. External risks from natural hazards should be determined on the basis of AS/NZS Risk Management Standard 4360:1999.

A review of potential hazards, accidents, during the construction, operational and decommissioning phases should be provided. The likelihood of an event, the possible consequences of the event and safeguards to be implemented to reduce the potential risks will be discussed in quantitative terms where possible.

### **7.2 Emergency Management**

An outline of the proposed emergency management procedures is to be provided and should include for each site:

- contingency plans to deal with disease and mortality of stock during the operation and maintenance of the project;
- contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation and maintenance phases;
- ensure that development of emergency planning and response procedures are determined in consultation with regional emergency service providers; and
- include the relevant Commonwealth and Territory agencies in relation to emergency response and medical transport and first aid matters.

## **8 PUBLIC INVOLVEMENT AND CONSULTATION**

Public involvement and the role of government organisations should be clearly identified. The outcomes of surveys, public meetings and liaison with interested groups should be discussed and any resulting changes made to the proposal clearly identified. Details of any ongoing liaison should also be discussed.

Negotiations and discussions with local and community government, the Territory Government and the Commonwealth Government should be detailed and any outcomes referenced. Details of any ongoing negotiations and discussion with government agencies should also be presented.

## **9 ADMINISTRATION**

### **9.1 Number of Copies**

15 hard copies, 5 CD copies 2 ADOBE\*.pdf format and 1 unsecured word copy of the PER should be provided to the Office of Environment and Heritage (to allow placement on the Office's Internet site and to facilitate production of the Assessment Report and Recommendations).

In addition, the proponent will be required to distribute copies of the PER to public viewing locations (eg. libraries, council offices, etc.).

The proponent should also consider producing at least several copies for direct sale to the public, on request.

### **9.2 Advertising**

The PER is to be advertised in *The Northern Territory News*.

### **9.3 Contact Details**

The contact officer for this project is Ms Lisa Bradley who may be contacted on telephone number (08) 8924 4022, or email [lisa.bradley@nt.gov.au](mailto:lisa.bradley@nt.gov.au).



**Northern Territory Government**

Department of Infrastructure, Planning and Environment

## **APPENDIX 1**

### **CULTURAL HERITAGE MANAGEMENT REPORT**

#### **AUSSIE PRAWNS (HAYCOCK REACH)**

#### **SECTION 1880, HUNDRED OF AYERS, WEDDELL**

#### **NORTHERN TERRITORY**

#### **Heritage Conservation Services Office of Environment and Heritage**

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## 1.0 INTRODUCTION

A site visit to the Haycock Reach (Aussie Prawns) aquaculture farm (Section 1880) was conducted on 21 April 2004 by Gerard Niemoeller with Tom Rees of Kellog Brown and Root Pty Ltd (KBR) to investigate the status of archaeological places protected under the *Heritage Conservation Act* 1991 and provide management strategies to ensure the cultural heritage values of these places are preserved.

These sites were located during the original archaeological survey as detailed in Appendix C of the Haycock Reach Preliminary Environmental Report (PER) produced by Kinhill 1992.

## 2.0 MANAGEMENT OBJECTIVES FOR SHELL MIDDENS AT HAYCOCK REACH

Archaeological sites are similar to any other natural resource in that they represent a finite and unique resource that cannot be replaced once they are lost. The effective management of these places is therefore crucial to retaining these resources for the future.

A number management objectives have been identified by Heritage Conservation Services with respect to shell middens in the Darwin region (Gregory 1996). The broad goal of these objectives is to ensure that a representative sample of sites is conserved in the Darwin region for future research, community education and awareness. More specific objectives are to:

- ensure protection of those archaeological sites of high significance;
- ensure consistency in significance assessment and subsequent decision making processes; and
- ensure adequate mitigation works are conducted for those sites which are to be disturbed or destroyed prior to development.

A number of sites located during the initial archaeological survey were accorded a high to very high level of significance (Sites 1, 2, 5, 7, 10, 11, 12, 14, and 15). Whilst the significance of these places may have changed in the 12 years since they were originally recorded, a reassessment of the significance is beyond the scope of this study. Further, given extant sites identified in the original PER will not be impacted upon by the expansion, a reassessment is not required.

It is sufficient to state that the significance of these sites is likely to have changed in the time since they were first recorded (archaeological significance may have decreased in light of further survey work and the discovery of many more midden sites, where as cultural and education significance may have increased due to greater development pressures in Darwin Harbour and higher level of visitation to these places.

If at any time the proposed expansion is anticipated to impact on any of these places than a more comprehensive investigation and reassessment of these sites will be required.

## **2.1 Management strategies for shell middens at Haycock Reach**

Management strategies to be afforded middens within the Darwin harbour region will differ according to number of factors including the level of significance and the level of impact from development.

An appropriate level of management strategies for the middens at the Aussie Prawns site, Haycock Reach, should include:

- identification and designation of conservation areas containing the sites to be protected
- protection measures (i.e. fencing) to be implemented prior to the expansion and operations phase
- incorporation of a “no go” induction policy during the expansion and operations phase
- an appropriate level of monitoring during the expansion and operations phase

## **3.0 RELOCATION OF SITES AT HAYCOCK REACH AND RECOMMENDATIONS**

Following consideration of the proposed expansion footprint for the Aussie Prawns development, this investigation was targeted toward those sites that were in close proximity to existing or proposed infrastructure (Sites 13-18). Details of each site relocated are below. Some general remarks for the remaining sites are provided in Section 4.

In general, all of the sites relocated during this investigation seem to maintain a similar state as that described in the 1992 PER. Visibility was generally low due to thick vegetation growth resulting from the wet season, and in two instances prevented access to the site. Access was not possible to sites 16 and 18.

### **3.1 Site 13**

**Site Type:** Shell scatter

**Grid reference:** 52 710819E 8608255N

Small discrete scatter located across the apex of a small knoll on the eastern side of the dam. Although thick grass cover prevented detailed assessment of this site, the site appears to maintain an identical state to that recorded in the 1992 PER. Site 13 will not be impacted upon by the expansion of operations.

**It is therefore recommended that:**

- 1. no further mitigative measures are warranted regarding Site 13.**
- 2. The proponent notify this Office should they alter the current proposal or intend to undertake any actions that may potentially, either directly or indirectly, impact or disturb this site in anyway.**

### **3.2 Site 14**

**Site type:** Shell midden

**Grid reference:** 52 710685E 8608097N

A moderately large midden site containing stratified deposit. The main concentration of midden material occurs on a small spur extending off a the low ridge extending north east along the dam. A low level of visibility was afforded across the site and surrounding area due to the thick vegetation. Site 14 appears to maintain an identical state to that recorded in the 1992 PER. Although the site will not be directly impacted during the expansion of the aquaculture development, the site may be vulnerable to disturbance both during the expansion and operations.

**It is therefore recommended that:**

- 1. this site be fenced prior to any activities that have the potential to disturb the site.**
- 2. fencing be undertaken following a visual assessment of the site and surrounding area at a time when a higher level of visibility is afforded and preferably during the dry season following a burn off.**
- 3. The assessment and fencing be undertaken in consultation with a Heritage Officer from this Office or a suitably qualified archaeologist.**



- 4. The proponent notify this Office should they alter the current proposal or intend to undertake any actions that may potentially, either directly or indirectly, impact or disturb this site in anyway.**

### **3.3 Site 15**

**Site type:** Shell midden

**Grid reference:** 52 710647E 8608051N

A moderately large midden site containing stratified deposit. The main concentration of midden material occurs at the southern end of a low ridge extending to the north east along the dam. A low level of visibility was afforded across the site and surrounding area due to the thick grasses. Remains of a fence in accordance with the recommendations for the PER were noted on the northern slope. Site 15 appears to maintain an identical state to that recorded in the 1992 PER. Although the site will not be directly impacted during the expansion of the aquaculture development, the site is vulnerable to disturbance both during the expansion and operations.

**It is therefore recommended that:**

- 1. this site be fenced prior to any activities that have the potential to disturb the site.**
- 2. fencing be undertaken following a visual assessment of the site and surrounding area at a time when a higher level of visibility is afforded and preferably during the dry season following a burn off.**
- 3. The assessment and fencing be undertaken in consultation with a Heritage Officer from this Office or a suitably qualified archaeologist.**
- 4. The proponent notify this Office should they intend to alter the current proposal or undertake any actions that may potentially, either directly or indirectly, impact or disturb this site in anyway.**

### **3.4 Site 16**

**Site type:** Shell scatter

Access to this site was attempted on foot along the edge of the dam. Unfortunately the area was unable to be accessed. According to our files this site was damaged during the construction of the dam wall. The previous proponent was instructed by this office to undertake remediation works and fence the site. The general area does not appear to have been disturbed in the recent past and it is therefore assumed

that Site 16 remains in a similar state since closure of the previous operation.

**It is therefore recommended that:**

- 1. The site is inspected at a time when a higher level of visibility is afforded and preferably during the dry season following a burn off. It is likely that no further mitigation works will be necessary.**
- 2. The proponent notify this Office should they alter the current proposal or intend to undertake any actions that may potentially, either directly or indirectly, impact or disturb this site in anyway.**

### **3.5 Site 17**

**Site type:** Artefact scatter

**Grid reference:** 52 710497E 86080491N

This site could not be relocated due to thick vegetation and low visibility. There is also a possibility that this site has been disturbed by the previous development.

An area containing quartz gravels was located in a similar context to that described in the PER. A grid reference has been provided for this locality based on the description provided in the PER. A power line has since been installed through this area and recent grading up to the base of the hill may have also disturbed this site.

**It is therefore recommended that:**

- 1. The general area is inspected at a time when a higher level of visibility is afforded and preferably during the dry season following a burn off.**
- 2. The investigation should be undertaken by a Heritage Officer from this Office or a suitably qualified archaeologist prior to any further activities in the area that have the potential to impact upon this site.**
- 3. If the proponent intends to undertake works on the western side of the spillway, the area should be fenced pending investigation. This fencing should be undertaken in consultation with this Office.**
- 4. The proponent notify this Office should they intend to alter the current proposal or undertake any actions that may potentially, either directly or indirectly, impact or disturb the site area in anyway.**

### 3.6 Site 18

**Site type:** Artefact and shell scatter

Access to this site was attempted on foot from the base of the hill at two points. The hill was covered in thick grasses and vine forest and access to the crest of the hill was not possible. The general area does not appear to have been disturbed in the recent past and it is therefore assumed that Site 18 remains undisturbed.

**It is therefore recommended that:**

- 1. The general area is inspected at a time when a higher level of visibility is afforded and preferably during the dry season following a burn off.**
- 2. The expansion does not impact upon the hill beyond the current extent of disturbance.**
- 3. The proponent notify this Office should they alter the current proposal or intend to undertake any actions that may potentially, either directly or indirectly, impact or disturb this site in anyway.**

### 4.0 OTHER MANAGEMENT ISSUES

Sites (1-8) were located on the western side of the dam close to the boundary of Section 1810. A number of these sites were attributed with a high level of significance in the PER (Sites 1, 2, 5, 7). It is understood that site 1 was destroyed with the appropriate consent and following mitigation works during the initial development. No further action is warranted regarding Site 1.

The remaining sites (2-8), may potentially be vulnerable to disturbance should the proponent intend to install, maintain or upgrade any fence line or boundary perimeter around Section 1810. Although the potential impact upon sites 2-8 may be negligible the proponent should include a clear statement of intent regarding the installation, maintenance or upgrade of the fence line or boundary perimeter during the expansion and operations phase.

It is also recommended that some monitoring be undertaken of the sites considered vulnerable to disturbance through the expansion or operations of the project. An appropriate time to undertake monitoring of heritage sites may be during the annual EMP review and can be incorporated into this process.

Monitoring during the operational phase of the project is, however, only considered to be necessary on a biennial basis.

## 5.0 REFERENCES

Gregory, R. 1996 Sea shells by the seashore; a draft management strategy for middens in the Darwin region. Unpublished report held on file at Office of Environment and Heritage, Department of Infrastructure Planning and Environment.

Kinhill 1992. Haycock Reach aquaculture development. Preliminary Environmental report. Unpublished report prepared for J. Reid, Australian Frontier Holidays.

## Appendix 2

# NT Environmental Impact Assessment Guide Greenhouse Gas Emissions

### 1 PURPOSE

- 1.1** This Guide has been developed by the Office of Environment and Heritage (the Office)<sup>1</sup>. It provides advice to proponents about the minimum requirements for environmental management which the Office expects to be met when considering a proposal during the assessment process.
- 1.2** This Guide primarily addresses the minimisation of greenhouse gas emissions from new or expanding operations where greenhouse gas emissions are considered to be a relevant environmental factor in an assessment of a proposal under the *NT Environmental Assessment Act 1994*.
- 1.3** This Guide provides advice only. Proponents are encouraged to consider their proposals in the light of this advice. A proponent wishing to deviate from the guidance provided would be expected to put a well-researched and clear justification to the Office, rationalising the need for that deviation. In practical terms this means that the proponent would need to show that the intent of this Guide has been understood and given serious consideration.

### 2 THE GUIDANCE

#### 2.1 Overview

While there is a range of views within the scientific community over the climatic and environmental effects that can be expected as a result of the increasing atmospheric concentration of greenhouse gases, the majority view held in the scientific community is that global warming is occurring and that future climate change is inevitable.

The Northern Territory Government recognises that it has a role to play in addressing this complex and challenging problem. It is committed to greenhouse policies that are guided by scientific consensus and that take into consideration the Territory's current and future environmental, social and economic needs.

The Government's objective for managing greenhouse gas emissions from new and expanding operations is to reduce emissions to a level that is as low as practicable. To achieve this, the Office will ensure that potential greenhouse gas emissions from proposed projects are adequately addressed in the planning, design and operation of projects. Specifically the Office will ensure that:

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<sup>1</sup> This Guide has been based on a similar document produced by Western Australia's Environmental Protection Agency.

- best practice is applied to maximise energy efficiency and minimise emissions;
- proponents undertake an ongoing program to monitor and report emissions and periodically assess opportunities to further reduce greenhouse gas emissions over time;
- comprehensive analysis is undertaken to identify appropriate emission offsets; and
- due consideration is given to preparing for possible climate change impacts.

Emission offsets include activities that sequester carbon or reduce the greenhouse gas output or intensity per unit product from current or future activities. Examples may include but are not limited to:

- establishment and maintenance of perennial vegetation;
- sequestration of carbon by geological, chemical, biological or other means;
- reducing the carbon intensity of existing activities;
- replacing fossil fuels with renewable fuels;
- trading emission permits in a nationally approved system;
- synergistic linking of enterprises to reduce net greenhouse gas outputs; and
- development of new greenhouse gas efficient technologies.

Measures that offset emissions within the Northern Territory are encouraged, however, the Office recognises global nature of climate change and proponents are also advised to consider national and international offset options.

## **2.2 Guidance on greenhouse gas emissions**

Proponents should indicate the following in their environmental assessment documentation:

### **(a) Greenhouse gas emissions inventory and benchmarking**

Using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee<sup>2</sup> or another nationally agreed methodology:

- (i) Estimate the gross emissions of greenhouse gases that are likely to be emitted from the proposed project for each year of its operation in absolute and in carbon dioxide equivalent figures. The estimate of gross emissions should include on site and upstream sources, such as the production and supply of energy to the site. Emissions should be detailed on a gas by gas and a process by process basis.
- (ii) Detail the project lifecycle greenhouse gas emissions and the greenhouse gas efficiency of the proposed project (per unit of product and/or other agreed performance indicators). The parameters should be compared with similar technologies producing similar products. Reductions in emissions due to improvement in industry practice since 1990<sup>3</sup> should also be described.

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<sup>2</sup> Up to date methodology information can be obtained by contacting the Australian Greenhouse Office.

<sup>3</sup> The year 1990 has been selected because it is the base year against which the Kyoto Protocol's emission abatement targets are calculated.

- (iii) Estimate any removals of greenhouse gases due to carbon sequestration activities (see (c) below), in carbon dioxide equivalent figures for each year of operation.

**(b) Measures to minimise greenhouse gas emissions**

Consider a wide range of options (including, innovative options) and then indicate the intended measures and efficient technologies to be adopted to minimise total greenhouse gas emissions in the proposed project. This should include:

- (i) Identifying improvements in energy efficiency, conservation measures and the reduction of fugitive emissions where applicable; and
- (ii) Indicating where potential savings in greenhouse gas emissions can be made through the use of renewable energy sources. This should take into account fossil fuels used for supplementary power generation.

**(c) Carbon Sequestration**

Consider a wide range of carbon sequestration options and include intended measures for research and adoption. Options include:

- forestry or other revegetation;
- geological re-injection;
- chemical methods;
- soil uptake; and
- re-use.

**(d) Minimising emissions over the life of the project**

The design measures to minimise emissions, and the sequestration and sink enhancement actions to offset emissions, identified in points (b) and (c) above should, at a minimum, represent best practice at the time of seeking project approval.

Within the proponent's Environmental Management Plan, consistent with the principles of continuous improvement, the Office expects commitment to an ongoing program of monitoring, investigation, review and reporting of internal and external greenhouse gas abatement measures.

Proponents should also advise whether they will join the Commonwealth Government's "Greenhouse Challenge" voluntary cooperative agreement program (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate).

**(e) Benefits on a national or global scale**

This section provides the opportunity for proponents to place the proposal in a national and global context so as to provide an understanding of where broader offset benefits might occur. It provides the opportunity for the proponent to provide a

statement in support of the proposal indicating where positive outcomes would be achieved in relation to greenhouse gas emissions, regardless of where these measures are located.

The Office looks to proponents to provide the best possible outcome within the Northern Territory but also recognises the potential for benefits to accrue at the national and global scale. If a proponent has adopted best practice to reduce greenhouse gas emissions in the Northern Territory, the Office then acknowledges that benefits may also accrue through actions taken by the proponent elsewhere in Australia or internationally.

### **2.3 Preparedness for climate changes**

Proponents should demonstrate due consideration of the risk of climate change impacts. Relevant variables may include, but are not limited to:

- increasing average temperature and evaporation rates;
- variation in rainfall and the incidence of floods;
- sea level rise;
- increased frequency and intensity of cyclones and storm surge events; and
- altered distribution of pests and disease.

In assessing climate change risk, proponents should be guided by recent projections published by organisations such as the CSIRO or the Intergovernmental Panel on Climate Change.

## **3 LIMITATIONS**

This Guide has been prepared by the Office of the Environment and Heritage to assist proponents and the public. While it represents the contemporary views of the Office of the Environment and Heritage each proposal which comes before the Office of the Environment and Heritage for environmental impact assessment will be judged on its overall merits.

## **4 GLOSSARY OF 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 resources 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:** This is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential (GWP) factor. This will enable emissions of different gases to be added together and compared with carbon dioxide.

**Commonwealth Government's "Greenhouse Challenge" Voluntary Cooperative Agreement Program:** The Greenhouse Challenge is a cooperative effort by industry and Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. Participation in the challenge will be through 'cooperative agreements' between the Commonwealth Government and industry participants.

The objective of these agreements is to capture the capacity of industry to abate its greenhouse emissions, mainly by improving its efficiency in energy use and processing. A successful program will mean that Australia is developing sustainable strategies that respond effectively to climate change, while maintaining or enhancing Australian industry competitiveness.

The following features form the basis for cooperative agreements between industry and the Commonwealth to abate greenhouse gas emissions and enhance sinks, as part of a comprehensive approach.

Cooperative agreements include the following:

- an appropriate emissions inventory;
- specific greenhouse action plans;
- a commitment to regular monitoring and reporting of performance against action plans;
- provision for verification of performance; and
- a public statement, as agreed by the parties, on the undertakings contained in the agreement.

**Greenhouse Gases:** Proponents would be required to report on the emissions of:

- carbon dioxide (CO<sub>2</sub>),
- methane (CH<sub>4</sub>),
- nitrous oxide (N<sub>2</sub>O),
- perfluorocarbons (CF<sub>x</sub>)
- hydrofluorocarbons (HFCs), and
- sulphur hexafluoride (SF<sub>6</sub>)

Emissions must be reported in terms of their absolute emissions and their “carbon-dioxide equivalent” (CO<sub>2</sub>-e). The “carbon dioxide equivalent” is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential (GWP) factor published by the Intergovernmental Panel on Climate Change.

**Gross Emissions:** The actual mass of the greenhouse gases emitted. These emissions should be expressed as both absolute and “carbon dioxide equivalent” emissions.

**Global Warming Potential:** Global Warming Potential (GWP) is the warming potential of a gas. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. GWPs also vary with the time horizon being considered. The 100 year horizon is generally used in policy analyses. At the time of the publication of this document the published GWPs were 1 for carbon dioxide (CO<sub>2</sub>), 21 for methane (CH<sub>4</sub>), 310 for nitrous oxide (NO<sub>2</sub>), 23,900 for sulphur hexafluoride (SF<sub>6</sub>), 6,500 for the PFC perfluoromethane (CF<sub>4</sub>), and 9,200 for the PFC perfluoroethane (C<sub>2</sub>F<sub>6</sub>). GWPs are not yet available for other greenhouse gases.

**Project lifecycle greenhouse gas emissions:** Project lifecycle greenhouse gas emissions are those 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 the product or the final disposal or recycling stage of the exhausted product, depending on its nature. Proponents should justify their choice of the defined period.

**Measures:** Refers to the range of possible actions that could be undertaken which directly or indirectly contribute to the abatement of greenhouse gas emissions through source reduction or sink enhancement.

**National Greenhouse Gas Inventory Committee:** The National Greenhouse Gas Inventory Committee consists of representatives of the Commonwealth, State and Territory Governments and oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia. Up-to-date methodology information may be obtained by contacting the Australian Greenhouse Office.

**Net Greenhouse Gas Emissions:** The actual mass of the greenhouse gases emitted minus any emissions that may have been removed through sequestration or sink enhancement.

**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, the Office will need to take a common sense approach on a case by case basis in the interim. To assist proponents, the Office 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.

**Sink:** A pool or reservoir that absorbs and stores carbon, lowering the amount of carbon dioxide in the atmosphere.

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