



PART A

INFORMATION FOR THE PUBLIC

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

FRANCES CREEK IRON ORE MINE

Territory Iron Limited

March 2006

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1 PURPOSE

The Northern Territory Minister for the Environment and Heritage has determined that this proposal requires assessment under the *Environmental Assessment Act* at the level of a Public Environmental Report (PER).

The proponent has also referred the project to the Australian Government under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act). The Australian Government has determined the proposal is a controlled action under the EPBC Act. The controlling provisions for the proposed action are: sections 12 and 15A (World Heritage); 18 and 18A (Listed threatened species and communities); and sections 20 and 20A (Listed migratory species). The project will be assessed under a bilateral agreement between the Australian Government and the Northern Territory Government.

These guidelines have been developed to assist Territory Iron Limited in preparing a PER for the proposed Frances Creek Iron Ore Mine in accordance with Clause 8 of the Administrative Procedures of the *Environmental Assessment Act*. The object of these guidelines is to identify those matters that should be addressed in the PER. The guidelines are based on the initial outline of the proposal in the Notice of Intent (NOI).

These guidelines consist of two sections:

- Part A (this section) is the introduction and brief description of the project and the PER process; and
- Part B details the type and extent of information to be included in the PER.

The object of these guidelines is to identify those matters that should be addressed in the PER. The guidelines are based on the initial outline of the proposal in the proponent's NOI. The guidelines, however, are not necessarily exhaustive. They should not be interpreted as excluding from consideration any matters which are currently unforeseen that emerge as important or significant from scientific studies or otherwise during the preparation of the PER and the public consultation process.

This section of the guidelines has been developed to assist members of the public and other interested parties in preparing comments on the PER.

2 THE PROPONENT

The proponent is Perth-based Territory Iron Limited.

3 DESCRIPTION OF PROPOSAL

3.1 Introduction

The Frances Creek iron ore proposal is located approximately 180km south-east of Darwin and 30km north of the Pine Creek township.

Frances Creek lies within the Mary River catchment and is approximately 20km west of the Kakadu National Park boundary.

3.2 History

The Frances Creek area has undergone exploration and mining activities since the 1960s. Approximately six million tonnes of iron ore was produced from the deposits and exported via the Darwin port until 1974 when demand for the ore declined.

3.3 Geology

In the southern part of the Frances Creek project area the portions of the Pine Creek Orogen sequence exposed at surface are the Masson Formation and the Mundogie Sandstone and Wildman Siltstone with the Koolpin Formation, Gerowie Tuff and Mount Bonnie Formation occurring on the western property boundary. In the north, the main rock units are the Wildman Siltstone, the Koolpin Formation and the Gerowie Tuff. Sporadic Zamu Dolerite sills occur within the sequence with two major areas of granitoid intrusives occurring in the south and the north central portions of the property.

Jurassic to Cretaceous sediments of restricted development occurs in the southern parts of the property at higher elevations.

3.4 Resources

Production of about 1,000,000 tonnes of iron ore per annum is anticipated.

3.5 Mining

Territory Iron proposes to mine the Frances Creek deposit by conventional open-cut methods. It is anticipated that initially three separate north-south trending open pits will be developed by extending existing pits, followed by development of a new area to the north.

3.6 Mining waste

Mining operations for the proposed pit design will produce 3 million tonnes of waste rock and overburden annually, which will be placed in purpose-built waste dumps adjacent to the open pits. It is estimated that 30% of waste rock will be backfilled into pits at the later stages of pit development. The waste products are expected to consist of largely inert waste rock and tailings (ground up rock). Tailings will be produced if wet screening is required. Waste rock will comprise largely oxidised siltstone and shales as well as some dolerite and cretaceous sediments. Acid rock drainage is not expected but further characterisation of waste will be undertaken as part of the PER studies.

3.7 Ore processing and transport

A small processing plant will be constructed where the ore will be crushed and screened before being loaded onto road trains or haul trucks and transported to a storage area adjacent to the Alice Springs to Darwin railway line. From the storage area, lump and fine iron ore product will be loaded onto suitable rail carriages and transported to Darwin for export. Environmental issues associated with the development of a stockpile site at Darwin are being assessed in a separate proposal.

3.8 Water management

Sediment traps are proposed be established at appropriate runoff points from the stockpile and plant site to reduce sediment leaving the site. Water diversion structures and drains will also be constructed to separate natural water flows from disturbed areas where practical. Water produced from pit dewatering and the TSF will be reused in the processing plant or for dust suppression and will not be released to water courses.

A sampling program will be implemented to monitor water quality from the site and groundwater and surface water strategies will be developed during the environmental assessment process.

3.9 Infrastructure

On-site infrastructure will include:

- Power generator for processing facility;
- Landfill facility;
- Mine office including first aid room, canteen, and toilets with septic tanks;
- Existing freshwater dams/bores;
- Fuel dumps; and
- Magazine and explosives store.

Additionally a rail load-out site including storage facility will need to be established. Consideration is being given to construction of a new road to facilitate shorter access to the rail siding.

3.10 Workforce

Up to 40 people may be employed for mining and haulage operations. A further four to six management and accounting staff would be present on the site. These people would be accommodated at Pine Creek.

3.11 Decommissioning

Disturbed areas will be progressively rehabilitated and waste rock will be retained within pits wherever possible. Abandonment bunds will be constructed around the completed pits. The waste rock dumps will be stabilised, contoured and revegetated. The embankments of the tailings storage facility will be vegetated and the top surface

will be allowed to dry out and consolidate prior to application of waste rock and revegetation.

4 PER PROCESS

The proponent has been directed to prepare a PER. Once prepared, the PER will be exhibited for public review and comment for a period of 28 days, during which time advisory bodies will also comment on the document.

The Environment Protection Agency will prepare an Environmental Assessment Report and Recommendations based on the PER and any comments received. If the Minister approves the Report and Recommendations, these are forwarded to the Australian Government Minister for the Environment and Heritage for approval consideration under the EPBC Act. Subject approval under the EPBC Act, the Report and Recommendations are then forwarded to the responsible (consent) Minister(s) for inclusion in permit, lease or license conditions and in relevant management procedures (e.g. Mining Management Plans).

The Assessment Report and Recommendations are included on the Environment Protection Agency's webpage and hard copies are provided to respondents and selected public libraries and viewing sites.

5 ADMINISTRATION

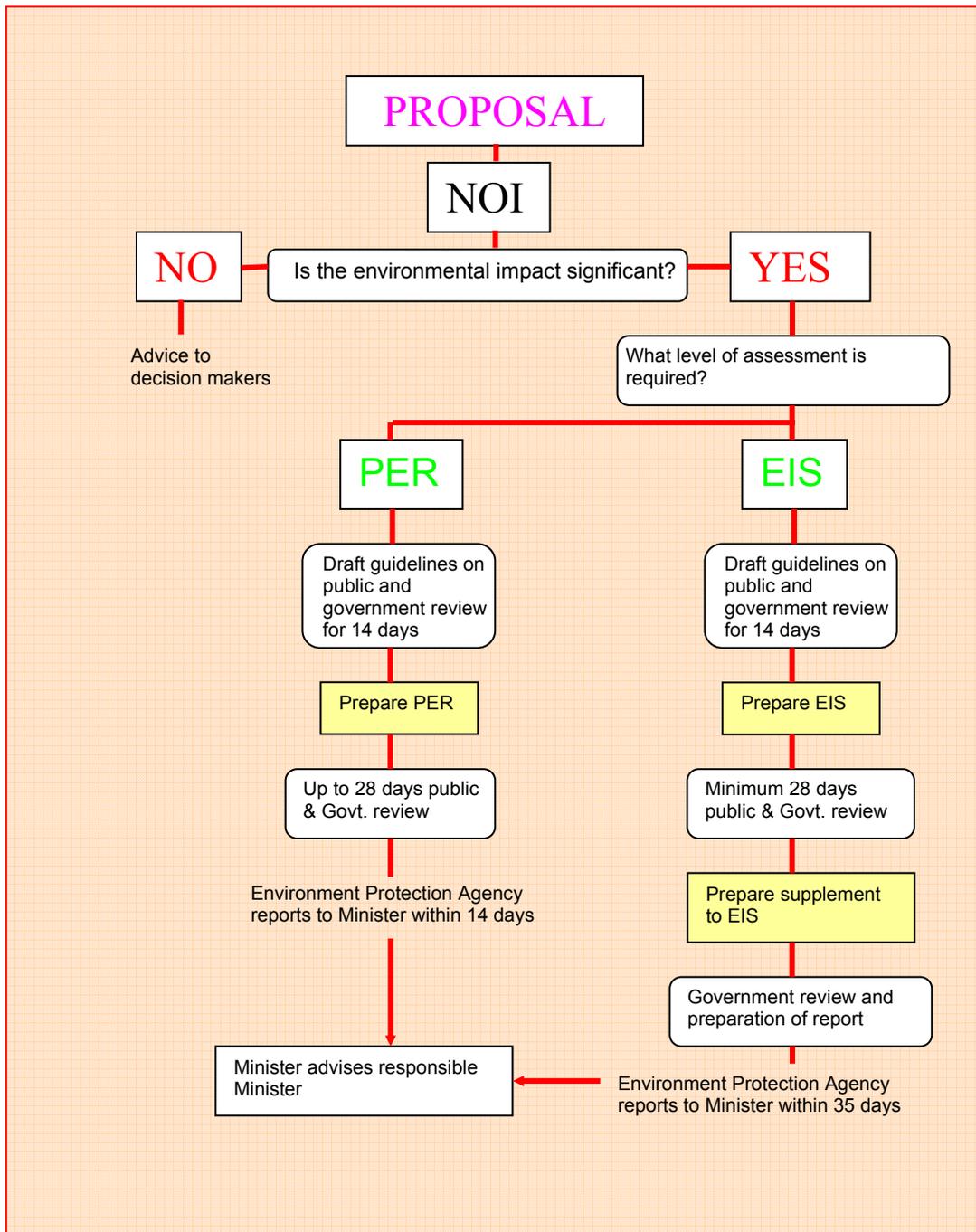
The nominated Action Officer for this project is Michael Browne from the Environment Protection Agency, Department of Natural Resources, Environment and the Arts. The contact telephone number is (08) 8924 4028 and facsimile number (08) 8924 4053, e-mail: michael.browne@nt.gov.au .

Copies of the final guidelines will be posted on the DNRETA website at [http:// www.nt.gov.au/nreta/environment/assessment/register](http://www.nt.gov.au/nreta/environment/assessment/register)

Copies of the PER will be available to the public for purchase from the proponent.

Comments on the PER should be forwarded to the nominated Action Officer.

Figure 1 The Northern Territory Environmental Assessment Process





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A PUBLIC ENVIRONMENTAL REPORT**

FRANCES CREEK IRON ORE MINE

Territory Iron Limited

March 2006

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1 INTRODUCTION TO THE GUIDELINES

These guidelines have been developed to assist Territory Iron Limited in preparing a Public Environmental Report (PER) for the proposed Frances Creek Iron Ore Mine in accordance with Clause 8 of the Administrative Procedures of the *Environmental Assessment Act* of the Northern Territory.

Administrative Procedures of the *Environmental Assessment Act* 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;
- 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.

The object of these guidelines is to identify those matters that should be addressed in the PER. The guidelines are based on the initial outline of the proposal in the proponent's NOI. However, they are not necessarily exhaustive. They should not be interpreted as excluding from consideration any matters which are currently unforeseen that emerge as important or significant from scientific studies or otherwise during the preparation of the PER and the public consultation process.

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 that demonstrates how these impacts will be minimised.

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

The PER should include the following sections, but need not be limited to these sections or inferred structure.

2 EXECUTIVE SUMMARY

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

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

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 project and include relevant plans, photos and maps.

Aspects to be covered include:

- An explanation of the objectives, benefits and justification for the project. The purpose of this is to place the proposal in the local and regional context;
- A description of the project's location indicating distance from Darwin and Pine Creek, and the project in relation to the Stuart and Kakadu Highways, the Adelaide to Darwin Railway and Kakadu National Park;
- A description of the history of mining at the proposed sites, including explanations of:
 - Why previous mining stopped;
 - Whether new technology has found a new ore-body;
 - Why old pits weren't filled in and decommissioned; and
 - Whether previous mining is still ongoing.
- An overall layout of the proposed mine site including pits, waste rock dumps, power generation, other infrastructure, waterways, access and existing features of interest;
- Comprehensive maps showing topography and all project components and land tenure;
- Comprehensive detailed topographic maps displaying watercourses in relation to mine workings and drainage lines from the workings;
- Project schedule;
- Location and design criteria for each component 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 (e.g. storage areas, waste dump areas etc);
- Employment and business opportunities (direct and indirect), including sources of workforce, skill levels required and opportunities for Aboriginal people and businesses; and
- Methods for storage, handling, containment and emergency management of chemicals and other hazardous substances (including fuel and explosives).

For the development and operation of the mine the proposal description should consider, as a minimum, the following:

3.1 Site Preparation

- Describe and provide a Construction Environmental Management Plan (CEMP), as part of the overall draft Environmental Management Plan (EMP) required (see Section 7 for details).
- Outline the construction timing, methods, equipment and materials (types, sources and quantities).
- Describe water requirements, usage, source, storage, treatment and disposal. Information is to be provided on how much water is required and how this water is to be sourced.
- Describe on-site and off-site borrow material requirements, extraction methods and uses.

- Describe the level of environmental disturbance already existing on the mining lease sites.

3.2 Mine

- Characterise all mined product, with respect to ore content as well as possible contaminants in processed material and overburden. Describe any radioactive constituents.
- Describe mining methods and application of industry best practice.
- Current ore reserves and mine life.
- Describe the design of pits and their dimensions (including maps, plans and geological cross-sections).
- Describe mining methods, scale of operations and timetable for ore extraction and open cut operations.
- Detail drilling and blasting requirements (including frequency).
- Outline possible future extensions to the mine operation, and discuss the probability of mining satellite ore bodies.
- Include the provision for determination of design parameters, based on the geotechnical characteristics of the slope and include geotechnical constraints for pit slope, catch berm, slope monitoring and pit safety management.

3.3 Waste Rock Management

- Identify total amount of waste rock and overburden to be produced.
- Characterise waste rock in terms of AGP (acid generation potential) and neutralising capacity from drill core samples and in-situ assessments (kinetic tests and field trials); include sample selection methodology.
- Describe means of interception and management of potential acid mine drainage.
- Characterisation needs to identify any potential problematic waste that may have an impact on the receiving environment, not only in terms of AGP. Describe means of interception and management of problematic mine drainage.
- Identify classes and amounts of waste rock for handling purposes.
- Outline proposed waste dump locations, dimensions, water catchments, surface treatment and final landform (discuss alternatives).
- Describe in detail the methods for waste rock disposal and dump construction; including strategic positioning of different waste rock types.

3.4 Ore Processing and Tailings Management

- Detail options for processing the ore.
- Describe capacity of proposed ore processing facility to treat the ore and safely dispose of any tailings produced.
- Indicate all input products (solids, gases and liquids) and pathways for each item in the process.
- Indicate all output products (solids, gases and liquids) and pathways for each item in the process.

- Describe proposed tailings disposal. On what basis will the need for a tailings dam be determined?
- Characterise the tailings in terms of AGP (acid generation potential).
- Provide total characterisation geochemically of the tailings, and identify any potential problematic waste that may have an impact on the receiving environment, not only in terms of AGP. Describe means of interception and management of problematic mine drainage.
- Detail any proposed stockpiling of ore on site and associated management.
- If tailings dam is included in the proposal the PER needs to design input to select appropriate options relevant to topography to ensure physical safety and appropriate environmental performance.

3.5 Water Management

- Detail the site water requirements and identify sources.
- Provide a site water balance (all inputs and outputs) for the expected mine life, including rehabilitation.
- Describe the proposed management of clean, dirty and contaminated water.
- Describe the management of potential acid drainage and metal contaminated waters. Discuss management options, with the purpose of determining that the preferred option is the most effective. If a wetland filter is proposed, then provide full design specifications, including details of residence time and the management of overflow events.
- Describe the diversion of surface waters.
- Describe dewatering of the pit, including expected water quantities and qualities. Outline disposal/ use options for water gained from the dewatering process.
- Describe the management of high/extreme rainfall events.
- Identify individual aspects of the proposed development that have the potential to impact on groundwater and surface water quality.
- Describe monitoring to be undertaken on the broader Mary River Catchment.

3.6 Rehabilitation and Decommissioning

The rehabilitation program should be integrated into the mine plan and considered as part of the mining operation, rather than as a separate phase at the end of the mine life.

The project description should consider, as a minimum, the following:

- An estimation of the total area of disturbance;
- Identification of a post mining land use and rehabilitation objectives;
- Rehabilitation commitments and timetables (for both temporary and permanent facilities) including waste management, pollution control and stabilisation and rehabilitation plans for mined areas; and
- Analysis of the feasibility of backfilling of pits with waste rock.

- Describe in detail the following:
 - Progressive and final rehabilitation plans for pits, waste rock dumps, ROM pad, roads and infrastructure sites;
 - Design of rehabilitated landforms, in particular rehabilitation techniques, including methods to reconstruct the landscape using the materials available;
 - Profile reconstruction and viability for the growth of native species.
 - Collection and selection strategy for native species, e.g. native grasses and other vegetation;
 - Runoff and erosion control measures of rehabilitated areas;
 - Final topographic and drainage morphology;
 - Maintenance of water quality; and
 - Revegetation procedures.
- Describe the current use of the land.
- Describe the nature and extent of any anticipated post-closure land forms that may reduce land area available for beneficial use.

3.7 Transport

The project description should consider, as a minimum, the following:

- Description of transport systems and methods to convey all site traffic (including materials, workers and product) to and from the site (both during construction and operation) including:
 - Type, size and number of vehicles required during all phases of the proposal;
 - The estimated volumes, tonnage, composition, origin and destination of traffic generated by the proposal;
 - Estimated times of travel;
 - Additional road infrastructure works required including site access and signage;
 - Description of any proposed haul roads, including length, location, land requirements, tenure and acquisition requirements; and
 - Description of construction methods and timeframes for any proposed private and public haul roads.
- Consultation undertaken with relevant regulatory agencies;
- Necessary approvals required; and
- Describe environmental controls and management techniques for temporary storage of product adjacent to Rail Siding. Include details on loading procedures.

4 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 selection criteria should be discussed, and the advantages and disadvantages of preferred options and alternatives detailed. The potential impacts of the alternatives should be described.

Alternatives to be discussed should include:

- Not proceeding with the project;
- Alternative locations, including process plant;
- Alternative sources of raw materials for the project, including water supply;
- Alternative transport corridors and options;
- Alternative extraction and processing technologies considered;
- Alternative environmental management technologies considered, such as treatment and disposal of by-products and waste products; and
- Alternative workforce accommodation.

5 EXISTING ENVIRONMENT, POTENTIAL IMPACTS OF THE PROJECT AND MANAGEMENT

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 studies and long term monitoring locations established.

This section should also include an assessment of the level of significance of the impact, be it global, regional or local (e.g. global and national implications of greenhouse gases and the localised impact of service roads or artificial water bodies).

Cumulative impacts should also be discussed, also incorporating impacts from previous mining operations at the sites. The reliability and validity of forecasts and predictions, confidence limits and margins of error should be indicated as appropriate.

Description of those areas potentially impacted by the project should, as a minimum, include:

5.1 Landform

Baseline

- Provide maps and an interpretation of the regional geology and geomorphology of the site and peripheral areas.
- Discuss the soil types and land units of the site and peripheral areas.
- Provide seismic information for the site and peripheral areas.
- Detail the existing level of soil erosion and other disturbances.

Impacts

- Discuss limiting properties of landform considering erosion, rehabilitation etc.. This information may be provided through the development of a landform evolution model for the life of the project and beyond (this would also have benefit in assisting in progressive rehabilitation over the life of the project).
- Detail impacts of mining to the landform.

Management

Detail the safeguards, management and monitoring strategies that will be used to minimise impacts of construction and operation phases, including:

- Measures to avoid or minimise impacts;
- Management of topsoil; and
- Erosion and sediment control procedures and associated erosion and sediment control management plan.

5.2 Hydrology/Hydrogeology

Baseline

- Describe the site and regional surface water systems including:
 - rivers;
 - creeks; and
 - streamlines.
- Describe the site and regional ground water systems including:
 - confined aquifers;
 - unconfined aquifers; and
 - ground soaks, expressions etc.
- For both ground water and surface water systems, discuss:
 - their significance;
 - current uses;
 - beneficial uses;
 - flows (including flood contours) and discharge rates;
 - water quality;
 - release or seepage of heavy metals; and
 - characterisation of all water sources (both surface and groundwater).

Impacts

Describe how the project will impact or has the potential to impact on each of the above elements. In particular, consider:

- Impacts on surface and groundwater from mining, ancillary activities and associated infrastructure requirements, including impacts on:
 - water quality;
 - changes to/ diversion of surface waters; and
 - aquatic flora and fauna.
- Impacts associated with dewatering of the pits (including water disposal);
- Possible acidification of groundwater due to aerial exposure in the pit void;
- Possible chemical constituents in drainage, specifying test methods (provide all test information);
- Current downstream users and their requirements; and
- Anticipate post-closure pit water quality.

Management

Detail the safeguards, management and monitoring strategies that will be used to minimise impacts of construction and operation phases, including:

- Treatment, storage and disposal of waste water, including stormwater run off;
- Management of clean, dirty and contaminated water;
- Management of high/ extreme rainfall events;
- Protection of beds and banks of watercourses;
- Means of interception and management of potential acid mine drainage;
- Management of pit water;
- Need for a waste discharge licence;
- Protection of surface water from potential contamination;
- Protection of groundwater from potential pollution sources;
- Proposed monitoring of surface and ground waters;
- Continued water monitoring and discharge requirements following decommissioning;
- Ongoing water requirements for the maintenance of wetlands or other water management structures; and
- Potential downstream impacts on the values/attributes of Kakadu World Heritage Area.

Include a map of water management system showing all structures and routes. Details of surface water sampling points and groundwater investigation bores should also be included.

5.3 Waste Rock

Baseline

Characterise waste rock in terms of net acid generation and net acid potential from drill core samples and in-situ assessments (kinetic tests and field trials).

Impacts

Describe in detail the methods for waste rock disposal and dump construction; including sample selection methodology and characterisation to direct different waste rock types to appropriate locations for disposal, and cross sections for the design of the waste rock dumps. Problematic waste will require strategic positioning and management.

Management

Detail the safeguards, management and monitoring strategies that will be used to minimise impacts.

5.4 Ecology

Baseline

- Specify the extent of clearing (proposed annual and total amounts).
- Survey flora and fauna species (including migratory species) and biological communities. Include surveys of vertebrate and invertebrate species.
- Survey aquatic species in any included or affected waterbodies / watercourses.
- Survey methodology should:
 - Follow best practice and advice from relevant agencies;
 - Consider seasonality, species rarity, potential for occurrence of significant species and sensitivity of species to disturbance;
 - be included in appendices; and
 - Identify rare, threatened and endangered species against NT and Commonwealth legislation, and species with indigenous conservation values.
- Special consideration should be given to the following:
 - Ecologically outstanding areas;
 - Vegetation that is the habitat of rare, threatened or endangered species or has outstanding diversity;
 - Communities that are exceptional examples of their type; and
 - Vegetation outside its normal distribution or of other biogeographical significance.
- A Wildlife Rescue Management Plan should be drafted to operate during land clearing operations and in conjunction with any transport operations between dusk and dawn;
- Surveys should be carried out to determine whether Gouldian finch populations occur in the area. The surveys should occur during the birds' breeding season (April-June); and
- A timeline to obtain any permits and meet other statutory obligations under NT legislation (*Planning Act 1999* and *s.38 Pastoral Land Act 1992*) for vegetation clearing.

Impacts

Describe how the project will impact, or has the potential to impact on each element identified above with particular consideration given to the following:

- Impacts of clearing;
- Impacts on all species, communities and habitat types affected by the proposal. Provide detailed analysis of impacts upon those of local or regional or national significance. Detail should also be with reference to the inputs and outputs from the mining and processing operations;
- Rate the risk and seriousness of each impact;
- Identify noxious weeds that may result from the project activity; and
- Examine potential impacts upon migratory, rare, threatened or endangered species.

Management

Detail the safeguards, management and monitoring strategies that will be used to minimise impacts of construction and operation phases, including:

- Minimisation of disturbance;
- Rehabilitation methods including revegetation strategies and flora selection;
- Weed management plan (to be included in the Environmental Management Plan and to follow best practice and advice from advisory agencies);
- Vegetation Clearing Plan (to be developed as part of the Environmental Management Plan);
- Actions to prevent the development of mosquito and other biting insect breeding habitats; and
- Detail proposed feral animal control.

5.5 Air Quality and Noise

Baseline

- Provide background dust, air quality, noise and dispersion levels.
- List all meteorological conditions including but not limited to:
 - Prevailing wind directions and strengths;
 - Maximum wind gusts;
 - Precipitation data (maximum, minimum, average, design rainfall intensities);
 - Temperature data; and
 - Evaporation data.

Impacts

- Describe how the project will or has the potential to impact on each element with particular consideration given to the following:
 - Potential air emissions;
 - Dust, including projected particle size and distribution; and
 - Noise, including levels, timing and duration and comparison to current levels (with respect to any nearby receivers).
- Provide information on ore toxicity in terms of human health and Occupational Health and Safety.
- Identify individual aspects of the proposed project that have the potential to impact on air quality.
- Identify any residents or other persons that may be impacted by degraded air quality.

Management

- Detail the safeguards, management and monitoring strategies that will be used to minimise impacts of construction and operation phases, including:
 - Dust suppression and monitoring, including during ore transportation; and
 - Noise mitigation.

- Describe mechanisms available to the community to lodge complaints about dust emissions and noise, and how the proponent will monitor and assess any complaints.

5.6 *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) Triggers

The Frances Creek Iron Ore Mine has been deemed a *Controlled Action* under the EPBC Act. (EPBC reference 2006/2550). The (Part 3, Division 1) controlling provisions triggered by the proposed action are:

- Sections 12 and 15A (World Heritage);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

EPBC triggers should be addressed in a separate section of the PER, along with any predicted impacts from the proposal upon any of the trigger issues, and details of protective management strategies proposed. Special consideration should be given to the following:

- Any migratory, rare, threatened or endangered species listed under the EPBC Act. As detailed in section 5.3 of these guidelines, surveys should identify existing populations and examine all potential impacts of the proposal upon any EPBC listed species;
- Surveys should be carried out to target potential Gouldian finch populations occurring in the area. Gouldian Finch surveys should take place during the birds' breeding season (April-June);
- Vegetation that is the habitat of any migratory, rare, threatened or endangered species listed under the EPBC Act; and
- Potential impacts on World Heritage values, including any ground water or water quality effects via Frances Ck flows upon the Mary River and Kakadu World Heritage area.

5.7 Greenhouse Gas Emissions

The Northern Territory 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. An assessment of greenhouse gas emissions for the project should be undertaken.

The assessment should outline, as a minimum, the following:

- Energy requirements for the project;
- Fuel sources for the project;
- Estimated greenhouse gas emissions; and
- A comparison with the national levels of greenhouse gas emissions.

Details should also be provided on the projects commitment to:

- Greenhouse gas emissions inventory and benchmarking;
- Measures to minimise greenhouse gas emissions;
- Minimising emissions over the life of the project; and
- Benefits of this project to abatement of greenhouse gas emissions on a national or global scale.

Refer to the attached Greenhouse Unit Guidelines at Appendix A for further information.

5.8 Cultural & Historical Environment

Baseline

This section should describe the anthropological, archaeological and heritage values of the development area, including sites and objects of Aboriginal significance.

As a minimum, information should be provided on the following:

- Historical uses of the site (Aboriginal and non-Aboriginal);
- Current use by Aboriginal people and the local Aboriginal people's relationships to the land including cultural values;
- Descriptions of the cultural and/or historical values that could be impacted by the project. These should include:
 - Places nominated for listing or listed on the Register of the National Estate or the Interim list of the Register of the National Estate; and
 - Places nominated for listing or listed on the Commonwealth or National Heritage list;
- World Heritage listed areas, including Kakadu World Heritage Area.
- Nominated, proposed and declared heritage places and objects under the NT Heritage Conservation Act 1991;
- Prescribed archaeological and heritage places and objects under the NT Heritage Conservation Act 1991;
- Areas with special values to indigenous and non-indigenous people, e.g. traditional land use, landscape, visual environment, heritage, recreational, commercial, tourism, scientific or educational values;
- Areas of significance to the Aboriginal population and culture, including sacred sites within the meaning of the Aboriginal Land Rights Northern Territory Act 1976 and the Northern Territory Aboriginal Sacred Sites Act;
- National Parks, conservation reserves or any other category of Territory Park or Reserve;
- Consultation arrangements and any agreements with Local Aboriginal Groups or the Northern Land Council (NLC) under the Native Title Act 1993; and
- Local society and regional centres.

For each of these cultural values, indicate: importance, conservation status, national and international treaty obligations, and clearance permits required or obtained.

The methodology by which these sites and areas were identified, and their importance assessed, should include survey details such as dates, consultants, survey area and methods.

This section of the PER should also include:

- Results of the inspection of the Register of Sacred Sites maintained by the Aboriginal Areas Protection Authority;
- Details of the application lodged with the Aboriginal Areas Protection Authority for an Authority Certificate within the meaning of Part 3, Division 1 of the Northern Territory Aboriginal Sacred Sites Act;
- A copy of the Certificate issued by the Authority as a result of that application containing conditions, if any, relating to the protection of sacred sites on, or in the vicinity of, the project area; and
- Status of any negotiations with native title claimants/NLC or other requirements under the Native Title Act.

Impacts

This section should describe the anticipated or potential impacts the project will have on each cultural or historical value indicated in the previous section. Consideration is to be given to the impact of the proposal on local Aboriginal employment levels and the influx of additional workers into local centres. Describe how these potential impacts are to be mitigated or managed.

5.9 Waste Management

- Identify and describe all sources of waste (note that waste rock issues are dealt with separately).
- Provide details of effluent disposal from the mine site.
- Outline proposed waste dump locations and dimensions (discuss alternatives).

Management

Detail the safeguards, management and monitoring strategies that will be used to minimise impacts during development and operation of the mine, including:

- Waste management program including reuse, recycling, storage, transport and disposal;
- Details of any pollutants that are likely to be released into the environment and measures to prevent or minimise this release of pollutants;
- Management of listed waste as per the Waste Management and Pollution Control Act; and
- Management of hazardous materials such as chemicals, fuels, oils and explosives.

5.10 Traffic and Transport

Baseline

Describe the existing transport infrastructure at locations likely to be impacted by the project.

Impacts

- 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.
- Identify anticipated utilization of existing transport services, especially the railway, and of the common-user infrastructure at the port.

Management

Describe proposed safeguards, management and monitoring strategies that will be implemented to minimise potential transport impacts during construction and operation including, but not limited to:

- Methods for complying with any relevant road vehicle axle limits;
- Methods for securing loads;
- Measures to prevent sediment transport off-site via transport vehicles including shakedown areas or properly controlled truck-wash facilities;
- Measures to reduce any road traffic noise impacts;
- Consultation with local communities affected by transport impacts;
- Traffic management; and
- Management of driver fatigue.

5.11 Socio-Economic

Baseline

Describe the socio-economic characteristics of the region (including a prediction of trends over the expected operational life of the project)

Impacts

The section should present a balanced broad summary of the project's impact on the regional and Northern Territory economies in terms of direct effects on employment, income and production.

It should outline the overall economic benefits of the proposed project, the likely contribution of the project to the development of mining industry, regional economic development and Indigenous economic development in the Northern Territory,

employment and skills development outcomes and linkages with other Territory business and sectors, including suppliers and other service providers.

It should specify:

- Estimated value of construction, highlighting the proportion to be spent in the Northern Territory and Pine Creek specifically;
- Estimate the value of annual expenditure on regional goods and services;
- Estimated the quantity and value of production/exports;
- Anticipated markets for products;
- An estimate of royalties and taxes to be paid to the Northern Territory Government and Traditional Owners;
- Opportunities for local industry and Indigenous workforce participation in the construction and operation of the facility;
- A breakdown of skills/trades required, including specific opportunities for skills development that may be of benefit to the local community, past the lifetime of the mine;
- Identification of opportunities for facilities and infrastructure development that may be of benefit to the local community, past the lifetime of the mine;
- Identification of negative impacts or potential synergies with existing land uses on Ban Ban Springs Station;
- A description of anticipated socio-economic impacts upon local residents, communities and towns; and
- Identification of the infrastructure, including housing, that would be required to accommodate employees in Pine Creek and how such infrastructure would be provided.

Management

- Detail how potential local business and employment opportunities and opportunities for synergistic facilities and infrastructure development will be identified.
- Specify the mechanisms that will be utilised to inform local business community and workers of business and employment opportunities.
- Detail the socio-economic indications that will be monitored on an ongoing basis.

5.12 Biting Insects

Biting insects need to be considered in the PER, the Environmental Management Plan and Closure Plan due to the potential of mine sites to create extensive breeding sites for mosquitos of pest and disease significance.

A baseline Biting Insect Assessment should be conducted at the proposed mine site. Please refer to Appendix B for details.

Mining method and design needs to occur in a manner that prevents mosquito breeding. Please refer to the attached Guideline “Guidelines for Preventing Mosquito Breeding Sites associated with Mining Sites” at Appendix B.

6 HAZARDS AND RISKS TO HUMANS AND FACILITIES

The PER should include a preliminary hazard analysis and assessment of the risks to people, the environment and nearby facilities from potential accidents associated with the construction, operation and maintenance of the various components of the proposal, storage and transport of materials to and from the complex.

The preliminary hazard analysis and risk assessment should outline and take into account emergency plans that detail strategies, response procedures and staff responsibilities in the event of an emergency or accident. Issues such as floods, bush fires, lightning strikes, mine collapse and landslip should be considered. Contingency plans for dealing with spillage of any hazardous materials should be detailed. The risks in relation to open pit rescue should also be discussed.

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

6.1 Risk Scoring

		CONSEQUENCE (C) <i>The results of the triggered issue on government reputation and or Mines Division opposability</i>		
		Low <i>Little to no impact</i>	Medium <i>Medium term -ve impact</i>	High <i>Irreversible or long term -ve impact</i>
LIKELIHOOD (L) <i>The probability of issue effecting the NT government in the life of the plan</i>	High <i>>75% Chance event will occur in life of plan</i>	4	7	9
	Medium <i>25% <> 75% Chance event will occur in life of plan</i>	2	5	8
	Low <i><25% Chance event will occur in life of plan</i>	1	3	6

• Critical Risk	• Information required immediately	•
• High Risk	• Information required prior to acceptance	•
• Moderate Risk	• Information required in next submission	•
• Low Risk	• General Information for consideration	•

7 PROJECT ENVIRONMENTAL MANAGEMENT

A draft Environmental Management Plan (EMP) should be provided in a form suitable for inclusion in a Mining Management Plan as required under the *Mining Management Act*. The draft EMP should be strategic, describing a framework for environmental management. Where possible specific management policies, practices and procedures should be included in the draft EMP. A final EMP would be prepared at the conclusion of the assessment, taking into consideration comments on the PER and incorporating the Assessment Report recommendations.

The draft EMP should:

- Define the management structure of both the construction and operational phases and the relationship to the environmental management of the site;
- Describe the proposed measures to minimise adverse impacts and the effectiveness of these safeguards (e.g. provide performance indicators by which all anticipated and potential impacts can be measured);
- Describe monitoring to allow early detection of adverse impacts;
- Describe remedial action for any impacts that were not originally predicted;
- Detail how monitoring will be able to determine the differences between predicted and actual impacts;
- Include a summary table listing undertakings and commitments made in the PER, including 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 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 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 including any negotiations with native title claimants.

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

9 INFORMATION SOURCES, REFERENCE LIST, BIBLIOGRAPHY

The PER should contain a comprehensive reference list or bibliography. Any source of information such as studies, research, maps and personal communications used in the preparation of the PER should be clearly identified, cited in the text and referenced in the bibliography.

10 APPENDICES, GLOSSARY

Information and data related to the PER, but unsuitable for inclusion in the main body of the statement, should be included as appendices. This may include detailed analyses, monitoring studies, baseline surveys, and raw data.

A glossary should be provided, defining the meaning of technical terms, abbreviations and colloquialisms. (Note: throughout the PER, technical terms and jargon should be minimised).

11 ADMINISTRATION

- At least one week prior to the PER being released for public exhibition, it should be submitted digitally to the EPA. This version of the PER should be in Word.doc format (unsecured .pdf format may be suitable for images) on CD/DVD, so the PER can be placed on the Agency's Internet site.
- ~ 20 copies of the PER should then be submitted to the EPA for distribution to NT Government advisory bodies (EPA will advise on exact numbers and formats).
- The PER should be publicly advertised for review and comment in the NT News, The Australian and the Katherine Times. The PER is to be made available for public comment for 28 days.
- The PER should be placed on public review at DNRETA and the Department of Primary Industry, Fisheries and Mines offices in Darwin and Katherine, council offices and the NT Library, Parliament House, Darwin.
- The PER is to be provided to the:-
 - NT Environment Centre
 - Northern Land Council
- The EPA action officer for this project is Michael Browne telephone (08) 8924 4028, facsimile (08) 8924 4053, email: michael.browne@nt.gov.au.

12 APPENDIX A

NT Environmental Impact Assessment Guide: Greenhouse Gas Emissions

12.1 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 Guide aims to assist proponents in providing the information needed by the Environment Protection Agency (EPA) to assess the impact of greenhouse gas emissions from proposed projects during assessment under the *Northern Territory Environmental Assessment Act 1994*¹.

12.2 THE GUIDANCE

12.2.1 Emissions estimates

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

¹ As required under Action 6.4 of the NT Strategy for Greenhouse Action 2006, available at http://www.nt.gov.au/nreta/environment/greenhouse/publications/pdf/greenhouse_action.pdf

a) an estimate of the **greenhouse gas** emissions for the construction and operation phases: in **absolute** and **carbon dioxide equivalent** figures (refer to the Glossary in this Guide) for each year of the project; and identified on a gas by gas basis and 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**² or another national or internationally agreed methodology.*

b) 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 context³.

12.2.2 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:

²Up to date methodology can be obtained from the Australian Greenhouse Office. See www.greenhouse.gov.au.

³Information on Australia's national emissions profile can be obtained from the Australian Greenhouse Office at www.greenhouse.gov.au; international emissions from the United Nations Framework Convention on Climate Change (UNFCCC) website at <http://unfccc.int/2860.php/>.

-
- (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) 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.

- 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. 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 emissions permits in a nationally approved system;
 - synergistic linking of enterprises to reduce net greenhouse gas outputs; and
 - development of new greenhouse gas efficient technologies.

Proposed emissions offsets projects should include an estimate of greenhouse gas emissions savings that are likely to be achieved through implementation.

Measures that offset emissions within the NT are encouraged, and EPA staff can discuss possible options with proponents.

12.2.3 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. It should be noted that in 2006, large energy users (those using greater than 0.5 petajoules per year) will be required by the Commonwealth Government to report publicly on their greenhouse gas emissions.

12.2.4 Preparedness for climate change

Proponents should demonstrate due consideration of the risk of climate change

impacts to the proposal. 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 levels; 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 and Intergovernmental Panel on Climate Change (For CSIRO projections, see: <http://www.ipe.nt.gov.au/whatwedo/greenhouse/documents/pdf/ntclimatechange.pdf>).

12.2.5 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: www.greenhouse.gov.au/challenge.
- **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, OEH will take a common sense approach on a case by case basis in the interim. To assist proponents, OEH 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 Potentials (GWPs)*

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous oxide (N ₂ O)	310
Perfluorocarbons (CF _x)	6500 - 8700
Hydrofluorocarbons (HFCs)	560 – 11 700
Sulphur hexafluoride (SF ₆)	23 900

- Greenhouse gas emissions expressed in carbon dioxide equivalent (CO₂-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 at the time of publication of this Guide

13 APPENDIX B:

Guidelines for preventing mosquito breeding sites associated with mining sites

13.1 BITING INSECT ASSESSMENT (Baseline Survey)

Biting insects need to be considered due to the potential of mine sites to create extensive breeding sites for mosquitoes of pest and disease significance, and the potential for the introduction into the NT of dengue carrying mosquito species from North Queensland and overseas. The location of the mine site to natural creeklines and large water bodies created by past mining activities could also potentially expose mine workers to mosquitoes and mosquito borne disease. It is therefore recommended that a Biting Insect Assessment be conducted at the proposed mine site, with an outline of the proposed Biting Insect Assessment provided below.

A Biting Insect Assessment generally includes a 12 month adult biting insect trapping program, with traps set once a month around the time of the full moon to locate monthly abundance of mosquito and biting midge species. Ground assessments are also conducted to locate actual and potential mosquito breeding sites within the development area, and an assessment of aerial photography is undertaken to locate potential mosquito breeding sites outside of the development area that may impact on the development area. Mining plans are also examined to evaluate the potential for mining operations to create new mosquito breeding sites. A detailed report is then prepared based on the findings of the biting insect assessment, with recommendations provided on how to prevent new mosquito breeding sites and reducing the impact of biting insects on mine personnel. The proponent or relevant environmental consultant should contact the Medical Entomology Branch to discuss the proposed Biting Insect Assessment.

13.2 GUIDELINES FOR PREVENTING MOSQUITO BREEDING SITES ASSOCIATED WITH MINING SITES

For more information contact:

Medical Entomology Branch
Department of Health and Community Services
PO Box 40596
CASUARINA NT 0811

Telephone: 89228901
Fax: 89228820

GUIDELINES FOR PREVENTING MOSQUITO BREEDING SITES ASSOCIATED WITH MINING SITES

Peter I. Whelan & Allan Warchot

**Medical Entomology Branch
Department of Health and Community Services
November 2005**

General Comments

All mining operations need to include a section in an Environmental Management Plan for the monitoring and control of mosquitoes. This is necessary because of the potential of mine sites to provide extensive breeding sites for mosquitoes of pest and disease significance. Mine sites also provide the potential for the introduction of mosquito species and mosquito borne diseases into the NT that are either exotic to the NT or have previously been eliminated.

The monitoring of adult mosquitoes in any new mine should include trapping of adult mosquitoes once a month at a number of sites for the initial 12 months baseline mosquito monitoring program. The baseline mosquito monitoring program provides an indication of the seasonal distribution of the mosquito species present and the relative potential impact of mosquito borne disease to mine personnel.

The monitoring and control of mosquito larvae should be an ongoing operation for the life of the mine. Mosquito larvae must be controlled with an approved mosquito larvicide (*Bacillus thuringiensis* var. *israelensis* or methoprene) as part of an organised monitoring and control program. Any mosquito control program should be discussed with the Medical Entomology Branch of the Department of Health and Community Services with regard to methods and insecticides.

Accommodation for personnel should be sited as far as possible from the most important biting insect breeding sites and be adequately insect screened or otherwise protected to reduce the impact of mosquitoes.

The potential for artificially created mosquito breeding sites can be minimised with the appropriate design of water holding facilities and water management procedures.

1. WATER DAMS

All water storage dams should be constructed with relatively steep sides (45° slope minimum) to discourage the establishment of semi-aquatic vegetation (eg. *Typha* and *Eleocharis* reeds) that will provide suitable habitats for mosquito breeding.

Dam margins should be as straight as possible to minimise the linear area available for the establishment of semi-aquatic vegetation.

Where possible, any closely grouped dams should be joined together to minimise the linear margin of vegetation.

The bottom of any dam should be graded as level as possible, with a slight slope to one end to form a deeper section for periods of low water. This will remove the potential for the formation of isolated pools as the water level recedes in the dry season.

Areas surrounding any dam that will be flooded during the wet season should be graded to enable water to drain freely into the dam as the water level recedes, without the formation of isolated pools that are capable of retaining water for a period greater than 5 days.

There must be no islands formed within any dam. All areas of impounded water should have a relatively deep (2 m) wet season stabilised water level to prevent the emergence of semi-aquatic vegetation.

Any drainage line directed into a dam must be fitted with a sediment trap or erosion prevention structures just upstream from the dam. This is necessary to prevent the formation of “alluvial fans” that will promote the establishment of semi-aquatic vegetation in the area of the fan where silt will be progressively deposited.

Any overflow areas from dams should have erosion protection measures to prevent the creation of plunge pools.

Local native fish should be introduced or have access into any dams where the water quality is suitable for their survival, to provide natural predators for the control of mosquito larvae.

The margins of any water dam should be inspected annually for vegetation growth such as semi-aquatic vegetation and grass. Any dense marginal vegetation should be herbicided or physically removed, to prevent the vegetation from creating suitable mosquito breeding sites.

2. WET LAND FILTERS

Wetland filters have the potential to provide prolific breeding sites for mosquito species of pest and disease significance. If no other alternative is available for the treatment and disposal of waste water, a wetland filter should incorporate the ability to annually reduce the build up of any dead vegetation. Plans for wetland filter design and siting should be forwarded to the Department of Health and Community Services (Medical Entomology Branch) at the planning stage to ensure that their potential impact on the health of mine site personnel is minimised.

Annual maintenance could be achieved by dividing a wetland filter into separate sections. A dual system will enable water to be directed into one section of the filter while vegetation is burnt or otherwise reduced in the other section. An ability to manipulate the water level in the filter to strand or drown vegetation would be beneficial for the management of vegetation and mosquito numbers.

Stocking the wetland filter with local native fish will provide a significant measure for controlling mosquito larvae. The provision of fish however will not remove the need for annual maintenance of the wetland filter.

Where appropriate, consideration should be given to the provision of a fish ladder on any overflow facility to enable the dispersal of fish into and upstream of the filter.

Wetland filters may need to be removed after mining operations are completed to enable the future development of adjacent land.

3. WEIRS

Any spillways must be fitted with erosion prevention structures to prevent scouring and siltation of creek lines during periods of overflow.

Fish ladders should be constructed where appropriate to enable the upstream dispersal of fish following periods of dam overflow.

4. MINE WASTE DUMPS

The final surface of mine waste dumps should be contoured so that the surface area is free draining and has no surface depressions.

Any runoff from a waste dump should be directed to a silt trap to prevent any siltation of natural creek lines. Siltation in creek lines can promote the formation of isolated pools or disrupt fish ecology and may lead to the subsequent establishment of mosquito breeding sites.

Mine waste dumps should be located away from natural drainage lines, to prevent the upstream impoundment of natural surface water flows. If impractical to locate mine waste dumps away from natural drainage lines, diversion drains will be required to direct surface water flows around the waste dump.

5. SEDIMENT TRAPS

Sediment traps need to be designed so that they are free draining within a period of 5 days after flooding.

Sediment traps should be maintained by silt and vegetation removal on an annual basis.

6. BORROW PITS

Borrow pits, costeans or scrapes must be rehabilitated such that they do not hold water for a period greater than 5 days. These sites can be rectified either by filling or rendering them to be free draining.

7. DRAINAGE PATHS

Natural drainage patterns should be maintained where possible. Access roads across drainage lines may need to be fitted with culverts of sufficient size to prevent upstream flooding for periods that will enable mosquito breeding. Culverts should be installed flush with the upstream surface level. Erosion prevention structures will need to be constructed on the downstream side of any culvert, and erosion prevention structures may also be required at the headwalls of any culvert.

Any disruption to surface drainage should be removed at the end of the mining operations.

8. WASTE WATER DISPOSAL

Septic tanks must be installed to DHCS guidelines and should be inspected on an annual basis by the Environmental Officer to ensure that tanks and their effluents do not breed mosquitoes.

Discharge, overflow or excess effluent from sewage treatment systems must be disposed of in a manner approved by DHCS. A sprinkler disposal system is suitable

under most situations. Infiltration systems are acceptable if soil conditions are favourable. The discharge of excess effluent into ephemeral creek lines is not acceptable.

Sewage ponds should be constructed with steep sides with an impervious lining and be regularly maintained to prevent vegetative growth at the margins (see "*The prevention of mosquito breeding in sewage treatment facilities*", available from the Medical Entomology Branch). Surface debris and algal scum should be removed on a regular basis. Monitoring of mosquito larvae should be conducted in sewage ponds on a regular basis and control treatments conducted when necessary.

Disposal of water into "Application areas" must ensure that water does not pool for a period greater than 5 days.

9. ARTIFICIAL CONTAINERS

Rainwater tanks must be adequately screened to prevent the entry of mosquitoes. Any container capable of holding water, eg. machinery tyres, drums, disused tyres, tanks, pots, etc. should be stored under cover, be provided with drainage holes, emptied on a weekly basis, treated with an appropriate insecticide on an appropriate schedule, or disposed of in an appropriate dump site to prevent the formation of mosquito breeding sites.

No used tyres, machinery or other containers that have previously held rain water should be brought to the NT from Queensland unless the containers or machinery has been thoroughly treated with chlorine or an appropriate insecticide to remove the possibility of the introduction of drought resistant eggs of exotic *Aedes* mosquito species.

10. RUBBISH AND GARBAGE DUMPS

Rubbish and garbage dumps must be operated in such a manner that there is no ground surface or water filled receptacle pooling of water for a period greater than 5 days, to prevent the formation of mosquito breeding sites.

Rubbish and garbage dumps must be rehabilitated by filling and surface contouring to ensure they are free draining and have no surface depressions.

11. DECOMMISSIONING AND REHABILITATION

A decommissioning and rehabilitation plan should be in place for all mining operations to ensure no actual or potential mosquito breeding sites remain after cessation of mining operations. All disturbed areas should be rehabilitated to be free draining where practical. The proponent should consult the Medical Entomology Branch for input when preparing this document.

Aspects to consider when decommissioning and rehabilitating a mine site include removing and appropriately grading all sediment ponds, removing all bund walls created for the development, removing infrastructure and artificial receptacles that could pond water, removing water dams and reinstating existing flowpaths where practical, rehabilitating borrow pits, removing wetland filters, sediment traps, and other facilities that could pond water and breed mosquitoes.

Facilities such as open pit voids and water dams can be left as water holding pits if they are constructed with steep sides (at least 1:2 slope), and stocked with fish during the rehabilitation process.

14 APPENDIX C

ENVIRONMENTAL HEALTH INFORMATION BULLETIN No. 6

Requirements for Mining, Construction & Bush Camps

This information bulletin has been developed to provide information to proponents of Mining, Construction & Bush Camps with regard to the Department of Health and Community Services' (DHCS) environmental health requirements. Issues covered include food business registration, boarding house registration, on-site wastewater disposal, wastewater stabilisation ponds, potable water supply, solid waste disposal, fuel storage, public health nuisances, and environmental management plans.

14.1 Registration as a Food Business

Larger camps that are not self-catering generally incorporate a commercial food preparation area (kitchen). The *Food Act 2004* defines a food business as 'any business or activity that handles food intended for sale or selling regardless whether the business is of a commercial, charitable or community nature or whether it involves handling or selling on one occasion only'. Consequently the camp's commercial food preparation area is considered to be a food business and therefore requires registration with DHCS in accordance with the *Food Act 2004*.

Registration can be carried out on-line and does not attract a fee. The Registration period is for 12 months with renewals due on 1 July.

To register, go to the DHCS website link or contact the relevant Environmental Health Office:

- <http://www.transact.nt.gov.au/thhs/healthmanager/HealthNotifications.nsf>

The *Food Act 2004* also requires all food businesses to meet the minimum standards prescribed by the *Food Safety Standards*:

- 3.1.1 Interpretation and Application
- 3.2.2 Food Safety Practices and General Requirements
- 3.2.3 Food Premises and Equipment

These nationally endorsed standards have been designed to be descriptive, rather than prescriptive and provide the food industry with an increased flexibility in meeting the desired outcome of providing safe food to consumers. Accordingly, Environmental Health Officers (EHO) are also now required to adopt a more flexible approach when assessing how businesses are able to meet the criteria contained within these Standards.

Australian Standard AS 4674 “*Design, Construction and Fit-out of Food Premises*” has been developed to assist the food industry in meeting the outcomes of the Standards. It is not prescribed by law that a premises must meet the requirements contained within, however a premises that meets AS4674 is deemed to comply with the *Food Act* and *Food Safety Standards*.

A food premises that does not meet the requirements of AS 4674 may still be able to meet the requirements of the relevant legislation. However, further evidence may be required to be provided to the EHO to ensure that they can be assured that the business will comply through other means. In some instances, a design issue may be able to be addressed through the development and implementation of appropriate workplace policies or procedures. This may, in turn, sometimes result in a delay of the approval process, and require the submission of more information than the typical application.

Approval Process

The approval process of a food business is dependent on its location, however it generally involves at least one inspection. Camps are by nature located in remote areas where Building Control in terms of the *Building Act* is not applicable. Building Control essentially means that a Building Certifier must certify all building structures to ensure compliance with the Building Code of Australia. Proponents are referred to Appendix 1 to determine if their project is located within a Building Control Area.

Inside a Building Control Area

Under the provisions of the *Building Act*, DHCS is a Reporting Authority and as such, Building Certifiers are required to seek the Department’s comments on all building applications involving, amongst other things, new or existing food businesses. The Building Certifier must submit detailed plans to the relevant Environmental Health Office prior to the construction of works. Following assessment and approval, the premises must be registered as a Food Business with the relevant Environmental Health Office prior to operating.

Outside a Building Control Area

Since Building Certification does not apply then DHCS becomes the first point of contact for approval of a food business. The proponent must submit detailed plans and specification to the relevant Environmental Health Office prior to the construction of works. Following assessment and approval, the premises must be registered as a Food Business with the relevant Environmental Health Office prior to operating.

14.2 Registration as a Boarding House

- The accommodation section of the Camp will require registration as a boarding house in accordance with the *Public Health Act and Public Health (Shops, Eating-Houses, Boarding Houses, Hostels and Hotels) Regulations*. The Registration period is for 12 months with renewals due on the 31 December. Annual Fees are applicable and are based on the number of bedrooms:

- 3-10 Bedrooms \$100 p.a.
 - 11-20 Bedrooms \$125 p.a.
 - 21-40 Bedrooms \$150 p.a.
 - > 40 Bedrooms \$250 p.a.
-
- A Boarding House application form can be downloaded online or by contacting the relevant Environmental Health Office:
 - http://www.nt.gov.au/health/healthdev/environ_health/environ_health.shtml
>application forms

Following a review of Northern Territory public health legislation, DHCS has developed *Public Health Guidelines for Commercial Accommodation 2005*. These Guidelines will eventually replace the current provisions relating to boarding houses in the *Public Health (Shops, Eating-Houses, Boarding Houses, Hostels and Hotels) Regulations* offering a less prescriptive approach and a clear set of minimum standards.

Room sizes in the Camp must comply with the provisions of *Public Health (Shops, Eating-Houses, Boarding Houses, Hostels and Hotels) Regulations* or the yet to be endorsed Guidelines. However, if the latter is chosen, it will be necessary for the proponent to make application in writing to the Chief Health Officer seeking approval to utilise the Guidelines.

Approval Process

The approval process of a boarding house is dependent on its location in a similar manner to food businesses, and also generally involves at least one inspection. Camps are by nature located in remote areas where Building Control in terms of the *Building Act* is not applicable. Building Control essentially means that a Building Certifier must certify all building structures to ensure compliance with the Building Code of Australia. Proponents are referred to Appendix 1 to determine if their project is located within a Building Control Area.

Inside a Building Control Area

Under the provisions of the *Building Act*, DHCS is a Reporting Authority and as such, Building Certifiers are required to seek the Department's comments on all building applications involving, amongst other things, new or existing boarding houses. The Building Certifier must submit detailed plans to the relevant Environmental Health Office prior to the construction of works. Following assessment and approval, the premises must be registered as a Boarding House with the relevant Environmental Health Office prior to operating.

Outside a Building Control Area

Since Building Certification does not apply then DHCS becomes the first point of contact for approval of a boarding house. The proponent must submit detailed plans and specification to the relevant Environmental Health Office prior to the construction of works. Following assessment and approval, the premises must be registered as a Boarding House with the relevant Environmental Health Office prior to operating.

14.3 Sanitary Accommodation & Ablution Facilities

Adequate numbers of ablution facilities and sanitary accommodation to be accessible for all operations in accordance with Building Code of Australia and relevant Northern Territory legislation.

14.4 Environmental Management Plans

The proponent shall provide the relevant Environmental Health Office with copies of Environmental Management Plans that relate to the Camp or Project Operations for initial comment.

14.5 On-site Wastewater Disposal

On-site wastewater disposal using septic tanks is likely to be the most suitable option for camps that have no major site constraints and comprise less than 20 staff. Larger camps may need to consider other options such as a treatment plant or waste stabilisation ponds. In all cases, the proponent should seek advice from a qualified hydraulic consultant about the most suitable wastewater disposal system. Reliability and low maintenance costs of remote on-site wastewater disposal systems should not be underestimated.

The design of septic tank systems is detailed in the Northern Territory *Code of Practice for the small on-site sewage and sullage treatment systems and the disposal or reuse of sewage effluent* (The Code). The Code was gazetted on the 11 November 1998 and is called up in Regulations 28-28B of the *Public Health (General Sanitation, Mosquito Prevention, Rat Exclusion and Prevention) Regulations*.

The Role of Regulatory Authorities

Local Government Authorities in the Northern Territory have no jurisdiction over on-site wastewater management, i.e. approval or monitoring of septic tank installations.

The Department of Planning and Infrastructure (DPI) administer the provisions of the *Building Act & Regulations* with respect to all septic tank installations within a Building Control Area.

DHCS administers the provisions of the *Public Health Act & Regulations* with respect to the:

- type approval of septic tanks and associated products.
- conventional septic tanks located outside Building Control Areas.
- notification to install an Alternative Septic Tank System (ASTS) for a single residential dwelling.
- site-specific design approval of an ASTS.

Conventional Septic Tanks & Alternative Septic Tank Systems

Conventional Septic Tanks (e.g. septic tank reticulating to absorption trenches or evapotranspiration bed) must be installed by self-certifying plumbers and drainers within Building Control Areas or by licensed plumbers and drainers outside Building Control Areas. The administrative process is dependent on whether the installation is located within a Building Control Area (urban areas and along main highways) or outside a Building Control Area (remote areas).

Alternative Septic Tank Systems (ASTS) are septic tank systems that treat effluent to a higher quality than that offered by conventional septic tank system. For example, these include Aerated Wastewater Treatment Systems (AWTS), Composting Toilets, Hybrid Systems and Ecomax Systems. In addition to the self-certification of the installation, ASTS require either a notification to install or site specific design approval.

- Septic Tank application forms can be downloaded online or by contacting the relevant Environmental Health Office:
http://www.nt.gov.au/health/healthdev/environ_health/environ_health.shtml
>application forms

Connection to existing Septic Tank Systems

If the proposal can utilise existing infrastructure such as septic tank systems, then the proponent will need to demonstrate that such infrastructure has adequate hydraulic capacity. This will require the proponent to engage a qualified hydraulic consultant to provide the relevant Environmental Health Office with as-constructed drawings of the existing infrastructure.

14.6 Trade Waste Pre-treatment Devices

Trade waste is defined as a “*liquid or liquid borne waste generated from any industry, business, trade, manufacturing process or similar that is approved for discharge to sewer but does not include wastewater from a toilet, shower, hand basin or similar fixture*”.

It is not recommended that trade waste be discharged to septic tank system, however a Camp’s commercial food premises may prepare cooked food generating liquid trade waste that comprises of food scraps, detergents, fats, oils and grease. This liquid trade waste has a substantial impact on a septic tank system, and if not contained by pre-treatment equipment will cause system failure. For this reason, it is mandatory that all greasy liquid trade waste must be discharged to sewer via a pre-treatment device that has been approved by Power and Water Corporation’s Trade Waste Section.

The requirements for trade waste pre-treatment devices are detailed in the following documents:

- Power and Water Corporation - *Guidelines for On-site Pre-treatment* which can be downloaded from the website at:
http://www.powerwater.com.au/powerwater/business/trade_waste.html

- DHCS Information Bulletin – *Trade Waste Pre-treatment Devices* which can be obtained from the relevant Environmental Health Office.

14.7 Waste Stabilisation Ponds

Waste stabilisation ponds (also known as sewage ponds) are used extensively in the Northern Territory for the treatment of wastewater prior to final disposal.

There is legislation to control the reuse or disposal of treated sewage effluent. The responsibility for enforcement of such legislation is vested with DHCS and the Environment Protection Agency (EPA). The discharge of treated sewage effluent to land or water may therefore occur, but only in accordance with pertinent legislation, or in its absence, to any reasonable conditions imposed by the relevant government agency.

Where treated sewage effluent is proposed to be discharged to a waterway and where the discharge does not have a potential to impact on public health, DHCS will liaise with the EPA as part of the approval process. Consideration will be given to the reuse/irrigation of treated sewage effluent in controlled public access areas, constructed and operated for this express purpose.

Approval Process

- Any proposal to construct waste stabilisation ponds at a camp shall require the submittal of plans, design specifications and disposal methodology to the relevant Environmental Health Office & the EPA for approval, prior to construction.
- Environmental Health Office will seek specific comment with regard to mosquito breeding from the Department's Medical Entomology Branch.

14.8 Potable Water Supply

- The camp must have a potable that complies with the NH&MRC *Australian Drinking Water Guidelines*. The relevant Environment Health Office may set conditions on the provision of water testing results. Proponents should note that water analysis can be carried out by the Water Laboratories at:
 - Alice Springs – Department of Natural Resources, Environment and the Arts - located at the Tom Hare Building, phone (08) 8951 8233
 - Darwin – Department of Primary Industries and Fisheries - located at Berrimah Farm, phone (08) 8999 2346
- Bore setbacks to onsite wastewater disposal shall be in accordance with the Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent.

Solid Waste Disposal

The *Waste Management and Pollution Control Act 1998* requires that certain waste management activities be licensed or approved by the EPA. An EPA approval for a landfill (rubbish dump) is not required if the landfill is for domestic waste generated on the premises or domestic waste from temporary construction camps.

An EPA licence for a landfill is required if the Camp serves a permanent population of more than 1000 persons or if the Project Operations generates hazardous waste. Further information can be obtained by contacting the EPA on (08) 8924 4139 or by going to their website > <http://www.nt.gov.au/nreta/environment/index.html>

Providing the landfill does not have to be licensed or approved by the EPA, then the proponent will still need to demonstrate to the relevant Environmental Health Office that the Camp's landfill meets best practice and will not cause an environmental or public health nuisance. Reference should be made to the *Guidelines for Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory 2003* which can be downloaded from the EPA website:

<http://www.nt.gov.au/nreta/environment/waste/codes/index.html>

14.9 Fuel Storage

Camps and their respective operations generally have a fuel storage facility. Environmental Health does not regulate fuel storage and therefore proponents should discuss this issue with the EPA. Reference should be made to AS 1940-2004 (and amendments) *Storage and handling of flammable and combustible liquids*.

14.10 Public Health Nuisance

The proponent shall ensure that the construction and operation of the Camp does not create a public health nuisance, in particular from dust or other particulate matter. Environmental Health has provisions to deal with public health nuisances under the *Public Health (Nuisance Prevention) Regulations*.

14.11 LOCATION OF ENVIRONMENTAL HEALTH OFFICES

Enquiries and applications should be directed to the Environmental Health Office for the locality in which the works are to be carried out.

Darwin Urban

Ground Floor
Casuarina Plaza
PO Box 40596
CASUARINA NT 0811
Telephone: (08) 8922 7377
Facsimile: (08) 8922 7036

Katherine West Health Board

Unit 10, Riverbank Office Village
Cnr First Street & O'Shea Terrace
PO Box 147
KATHERINE NT 0852
Telephone: (08) 8971 9315
Facsimile: (08) 8972 1233

Barkly

Health Development Building
Cnr Schmidt & Windley Streets
PO Box 346
TENNANT CREEK NT 0861
Telephone: (08) 8962 4302
Facsimile: (08) 8962 4420

Alice Springs Central Australia

Menzies Building
Cnr Gap Road & Stuart Terrace
Alice Springs Hospital Complex
PO Box 721
ALICE SPRINGS NT 0871
Telephone: (08) 8951 7518
Facsimile: (08) 8951 7859

Environmental Health Program Directorate

2nd Floor
Casuarina Plaza
PO Box 40596
CASUARINA NT 0811
Telephone: (08) 8922 7152
Facsimile: (08) 8922 7334
Email: envirohealth@nt.gov.au
Web: <http://www.health.nt.gov.au/> > Environmental Health

Darwin Rural

2nd Floor
Casuarina Plaza
PO Box 40596
CASUARINA NT 0811
Telephone: (08) 8922 7152
Facsimile: (08) 8922 7334

Katherine

NT Government Centre
First Street, Katherine
PMB 73
KATHERINE NT 0851
Telephone: (08) 8973 8767
(08) 8973 8411
Facsimile: (08) 8973 8592

Tiwi Health Services

Health House
Mitchell Street, Darwin
PO Box 40596
CASUARINA NT 0811
Telephone: 0401 116 030
Facsimile: (08) 8927 9170

East Arnhem

Endeavour Square
PO Box 421
NHULUNBUY NT 0881
Telephone: (08) 8987 0440
(08) 8987 0441
Facsimile: (08) 8987 0444

14.12 Explanation of Building CONTROL Areas

Building Control Areas in the Northern Territory are those areas declared under the *Building Act* by the Minister for Infrastructure, Planning & Environment.

Whilst some aspects of the *Building Act* apply to all of the Northern Territory, building control is only affect in gazetted Building Control Areas.

The extent of the gazetted Building Control Areas is detailed in the map of the building areas in the Northern Territory (overleaf).

The current Building Control Areas include:

- | | | |
|-----|-------------------------------|---------------|
| (a) | Adelaide River | Kings Canyon |
| | Alice Springs | Lake Bennett |
| | Batchelor | Larrimah |
| | Borroloola | Mataranka |
| | Brewer Estate | Namarada |
| | Darwin | Pine Creek |
| | Elliott | Tennant Creek |
| | Jabiru | Ti -Tree |
| | Katherine | Timber Creek |
| | Katherine Gorge National Park | Yulara |

NOTE:

- Detailed maps of these areas can be obtained from the Building Advisory Services Branch at Department of Planning & Infrastructure. BASB can be contacted in Darwin (Cavenagh House) on 8999 8965 or Alice Springs (Alice Springs Plaza) on 8951 9200.
- The township of Nhulunbuy is not a Building Control Area

- (b) Land within 500 m of each side of the road reserve of the highways and roads detailed on the map of the building areas in the Northern Territory.

NOTE:

- Where there are no road reserves then the distance is measured from the centre line.

BUILDING AREAS IN THE NORTHERN TERRITORY

