SUPPLEMENT TO THE DRAFT EIS

Andranangoo Creek West and Lethbridge Bay West Mineral Sands Mining Project

Prepared for

Matilda Minerals

50 Ord Street
West Perth WA 6005

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42213693

URS

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Appendices

1.1 Background on project

Matilda Minerals Limited (Matilda) proposes to mine mineral sands at Andranangoo Creek West (Andranangoo) and Lethbridge Bay West (Lethbridge), Melville Island, Tiwi Islands, Northern Territory. The proposed operation will extract high-grade heavy minerals, specifically zircon and rutile, for export to China. It is estimated that a total of 107,000 t of zircon and rutile will be exported during the anticipated mining operation of three and a half to four years. The zircon and rutile will be shipped directly from Port Melville on Melville Island to China.

1.2 Assessment process

The assessment process to gain the necessary approvals for Matilda's mineral sands mining project is set out below:

- Notice of Intent (NOI) – An NOI was submitted to the then Northern Territory Office of Environment and Heritage on 4 April 2005.
- Determination of Level of Assessment - On 19 July 2005 it was determined by the Minister for Natural Resources, the Environment and Heritage that the level of assessment for the proposed mineral sands project would be an Environmental Impact Statement (EIS).
- Public Review of Guidelines – Draft Guidelines covering issues to be addressed in the EIS were released for public comment on 1 August 2005 for 14 days. In September 2005, final Guidelines were issued.
- Preparation of a Draft EIS – The Draft EIS was prepared between August 2005 and February 2006.
- Submission of the Draft EIS and Public Review – The Draft EIS was released for public comment from 7 February 2006 to 6 March 2006.
- Preparation of EIS Supplement – Comments received as part of the public consultation period are addressed in a Supplement (this document). The Supplement together with the Draft EIS will be submitted to the Environment Protection Agency (EPA) for review.
- Government Review and Decision – A review of the information submitted will be conducted by the EPA and recommendations forwarded to the relevant Ministers for a decision.

In addition to the EIS procedures of the Northern Territory Government, under the Commonwealth Government's *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*, developments require assessment if they have the potential to affect one or more of seven Matters of National Environmental Significance (MNES), namely:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas; and
- Nuclear actions (including uranium mining).

Actions that may have a significant impact on Commonwealth land, even if taken outside Commonwealth land, and actions taken on Commonwealth land that may have a significant impact on the environment generally, are also covered by the EPBC Act.

A referral under the EPBC Act was submitted to the Commonwealth Department of the Environment and Heritage (DEH) in relation to Matilda's Sand Mining Project on 25 May 2005. A decision was made on 29 June 2005 that the proposed development constituted a Controlled Action under the following sections of the Act:

- Sections 18 and 18A (listed threatened species and communities); and
- Sections 20 and 20A (listed migratory species).

Controlled Actions under the EPBC Act are subject to final approval by the Commonwealth.

In July 2005 notification was received from DEH that the project would be assessed through accreditation of the NT assessment process under the terms of the Bilateral Agreement between the Commonwealth and Northern Territory Governments.

1.2.1 Bilateral Agreement

Under the Bilateral Agreement between the Commonwealth and the NT Government, the terms of assessment are considered on a case by case basis. In this case the Commonwealth requested that it have input into the development of the Draft EIS Guidelines.

Once assessment is completed to the satisfaction of the NT Minister for Natural Resources, the Environment and Heritage, EPA will report its findings to DEH, who will then advise of their final decision within 30 business days of submission of the EPA's recommendations.

It is expected that EPA will continue to liaise with DEH through the remainder of the approval process to ensure that both agencies are satisfied that all matters are being satisfactorily addressed throughout the process.

1.3 Draft EIS release and supplement preparation

1.3.1 Draft EIS release and public viewing

As noted in Section 1.2, the *Andranangoo Creek West and Lethbridge Bay West Mineral Sands Mining Project Draft Environmental Impact Statement* (Draft EIS) was released for Public Comment on 7 February 2006. The Draft EIS describes the proposed mining process, and assesses the likely environmental, social and economic impacts of the proposal.

The Draft EIS was prepared in accordance with the Guidelines issued by the EPA.

The public notice sought comments on the Draft EIS till 6 March 2006, a period of 28 days. However submissions were accepted to 10 March 2006.

Copies of the Draft EIS were available for viewing at the:

- Northern Territory Library, Parliament House, cnr Bennett and Mitchell Streets, Darwin NT;
- Darwin Public Library, Civic Centre, Harry Chan Avenue, Darwin NT;
- Casuarina Public Library, Bradshaw Terrace, Casuarina, NT;
- Palmerston Public Library, Civic Plaza, cnr University Avenue and Chung Wah Terrace, Palmerston, NT;
- Commonwealth Department of the Environment and Heritage Library, John Gorton Building, King Edward Terrace, Parkes, ACT;
- Information NT, Palmerston Shopping Centre; and
- Department of Planning and Infrastructure, Cavenagh House, Cavenagh Street, Darwin, NT.

Copies of the Draft EIS were also available for viewing at the following Tiwi Islands Communities:

- Milikapiti Community Centre;
- Pirlangimpi Community Centre; and
- Nguiu Community Centre.

The Draft EIS report was also available to be examined for the duration of the public review period on the Northern Territory Government Website:

http://www.nt.gov.au/nreta/environmental/assessment/register/index.html.

CD ROM copies of the Draft EIS were available for purchase for $25 per copy. Hard copy main reports with CD ROM appendices were available for $55 per copy. Hardcopy main report and hard copy appendices were available for $75 per copy.

Submissions were treated as public documents unless confidentiality was requested.

1.3.2 Draft EIS consultation

The Draft EIS was subject to a four week public review period.

Matilda maintained its existing stakeholder consultation programme during the public review period. The programme included the following actions:

- Ongoing meetings with the TLC and Traditional Owners.
- A community meeting involving a site visit, to address AAPA issues.
- Placing the Draft EIS on the Matilda Minerals website (www.matildaminerals.com).
- Media releases to provide information on the Draft EIS and its availability for review.
- A meeting with the Minister of Environment to provide an update on the preparation of the Draft EIS, the project benefits, consultations to date, and changes made to the project as a result of consultations and since the submission of the NOI.
- Presentations to and discussions with certain Government Agencies who responded to the Draft EIS, to discuss any outstanding issues.
- Providing information to stakeholders when requested, including responding directly to the stakeholders who asked questions during earlier consultations.

1.3.3 Number of submissions and key issues

A total of ten submissions were received, eight of which were received from local and Territory government agencies and bodies, one which was requested to be confidential, and one from a non-government organisation. The nine public submissions were received from the:

- Aboriginal Areas Protection Authority (AAPA);
- Department of Health and Community Services (DHCS);
- Department of Planning and Infrastructure (DPI);
- Department of Primary Industry, Fisheries and Mines (DPIFM);
- Environment Centre of the Northern Territory (ECNT);

- Environment Protection Agency (EPA);
- Department of Natural Resources, Environment and the Arts (NRETA) Heritage Advisory Services (HCS) and Advisory and Regulatory Services (ARS);
- Museum and Art Gallery of the Northern Territory (MAGNT); and
- Tiwi Land Council (TLC).

It is noted that MAGNT is part of NRETA, however the comments by MAGNT have been listed separately.

The areas of primary interest and/or concern, reflected by the number of submissions and comments, were:

- Mine management practices including rehabilitation;
- Landform and surface water impacts;
- Impacts of groundwater dewatering
- Impacts on fauna and flora
- Impacts on air and noise
- Radiation; and
- Socio-economic / heritage issues.

1.3.4 Process used to summarise the submissions

Upon receipt from the EPA, URS numbered and recorded all submissions on the Draft EIS.

The submissions were summarised and edited into a consistent format by URS for inclusion in the Supplement (this document). Copies of the summaries were forwarded to the EPA for review to ensure that the summaries adequately represented the comments that were made in the submissions.

The summarised issues, along with the responses to them, make up the main body of text of this Supplement.

1.4 Structure and scope of the supplement

Comments were received on most of the chapters of the Draft EIS. For ease of assessment, as far as practicable the order of the subject matter presented in this Supplement follows the order of the Draft EIS.

Throughout the text, the summarised and amalgamated key issues and comments are shown in bold italics. Each is immediately followed by Matilda's response in plain text.

The Supplement includes four appendices:

- Appendix A – Summaries of Responses and Index.
- Appendix B – Draft EIS Errata.
- Appendix C – Hydrocarbon Management Guidelines.
- Appendix D – Radiation Management Plan.

Appendix A contains summaries of the issues raised by each of the respondents, the sections of the Guidelines and Draft EIS relevant to each comment, and the section in this Supplement in which the comment is addressed. Appendix B lists Errata identified in the Draft EIS during the consultation process.

1.5 Project changes in response to community comments

In response to comments received on the Draft EIS, Matilda has made amendments to the proposal as set out in the Draft EIS, and commits to the following:

- A buffer zone of 50 m will be maintained from wetlands areas;
- Increasing the buffer zone from mangrove areas from 50 m to 100 m;
- No mining will be undertaken in coastal vine thicket areas. The vine thicket is of conservation significance and habitat to invertebrates of conservation significance, and was highlighted as an issue by some respondents;
- Ensuring that no mining will be undertaken in the drainage line from the escarpment spring in central Andranangoo Creek Project Area although it is noted that a 50 m buffer is not feasible in this area;
- Contracting the Tiwi Island Ranger group to provide rehabilitation services and manage the sea turtle monitoring program, with support of specialists as required;
- Offering traineeships to local Indigenous People;
- Attempt will be made to recover and transplant individual *Cycas Anstrongii* plants; and

- Waste will be removed from site and taken to Tiwi Islands Local Government landfill sites for disposal.

2.1 Mining slot depth

MAGNT have asked for clarification on the depth of slot mining at the sites.

As described in Section 2.2 of the Draft EIS, the depth to which the ore is extracted in the area to be mined depends on the depth and grade of mineralised material, with other factors being the watertable level in that particular area and prevalent climatic conditions.

Matilda will schedule to mine areas of the deposit where the water table is lowest during the wet season, and areas of the deposit where the water table is closest to the surface during the dry season.

2.2 Port operation

DPI has noted that although the loading and unloading of goods and ore at Port Melville will be controlled by PenSyl PL's management, procedures and guidelines, no further information has been provided in the Draft EIS. DPI has also noted that there is no Environmental Management Plan proposed for the port operations.

DPI has noted that no information has been provided on PenSyl PL or its management, procedures and guidelines for the operations at Port Melville.

DPI have stated that while the potential for spillage of mineral sands has been identified in Table 23.4 as an example of an Extreme and High Risk Event, there is no further discussion on the topic, and preventative measures have not been proposed for the mineral sand loading operations at Port Melville.

PenSyl PL operates their port facilities in accordance with their management procedures and guidelines, and applicable regulatory requirements. Assessment of the operation and management of PenSyl's facilities was not a requirement if the EIS Guidelines, and is considered to be beyond the scope of this Supplement.

However, it is proposed that, with the cooperation of PenSyl PL, Matilda would suggest appropriate management procedures for concentrate handling, and participate in inspection of concentrate ship loading operations. These procedures would be documented in a Matilda Port Operations Concentrate Handling Environment Management Program.

A framework of this EMP is provided below. The finalised EMP would be developed in consultation with PenSyl PL.

Table 1: Example Port Operation Management Program

Objectives and Targets	To minimise the impacts of minerals sands handling from Port operations To assist PenSyl PL operations in ensuring that good mineral sands management practices are adopted. To provide confidence that product from Matilda operations is being handled appropriately.
Actions	• Provide advice to PenSyl PL on mineral sands concentrate handling. • Conduct inspections in consultation with PenSyl PL during concentrate ship loading operations. • Conduct inspections in consultation with PenSyl PL to ensure the mineral sands stockpiling facility is being managed appropriately. • Liaise with PenSyl PL staff on loading works and ensure all PenSyl Pl staff are aware of the potential environment and health and safety issues in relation to handling mineral sands. • Develop a procedure in consultation with PenSyl PL to manage spills or other incidents.
Monitoring	Participate with PenSyl in inspection of concentrate ship loading operations.
Reporting	The results of the Port Operations Concentrate Handling Management Program will be documented in Matilda's Annual Report of performance against the MMP.
Corrective Actions	The following would constitute an incident or failure to comply: • Evidence of spillage. All incidents involving spillage of mineral sands at the PenSyl Pl port operations will be reported as part of Matilda's incident reporting procedures.
Relevant Legislation and Standards	• Matilda's Environmental Policy. • Waste Management and Pollution Control Act 1999. • Dangerous Goods Act 1981. • Marine Pollution Act 2004. • Marine Act 2005.

DPI have stated that the guidelines issued for the project did not require any specific assessment of port operations. Accordingly, DPI reserves the right to provide additional comment in relation to port operations.

DPI's right to provide additional comments in relation to Port activities is acknowledged.

Although the port operations are not within the scope set out in the EIS Guidelines, Matilda would develop an appropriate Management Program in consultation with PenSyl PL, as set out above.

2.3 Roads

DPIFM have asked whether consideration has been made to assess the impacts of the haul road(s) in relation to fauna injuries/fatalities, and the effects of dust.

Matilda has committed to developing a Road Management Strategy that will include these issues. In particular, a procedure for reporting fauna injuries/fatalities will be developed, and will ensure that issues in regard to fauna injuries and fatalities arising from use of haul roads are included.

Dust is recognised in the Draft EIS as an issue of concern and will be managed by dust suppression (wetting of the roads). It is likely that any impacts from dust will be restricted to the road side vegetation and is unlikely to cause significant impact to surrounding vegetation. The haul roads will by-pass communities; in particular the community of Pickertaramoor.

The ECNT have recommended that the size of trucks and number of truck movements between the mines and the port are kept to a minimal level to reduce impacts on the environment.

Matilda has stated in Section 19.3 of the Draft EIS that there will be on average four truck loads per day (two per shift), seven days a week, depending on weather conditions. In particular, truck movements will not be undertaken when damage could occur to haul roads.

These truck movements are not considered excessive and will be conducted by a double road train truck of 60 t capacity.

The TLC state that the existing access tracks are degraded and actively eroding, creating significant off-site sedimentation. The proposal to upgrade the tracks, widen the road and improve drainage will be beneficial to broader conservation outcomes.

This statement is supported by Matilda and extensive discussions have been undertaken with TLC to ensure any issues of concern have been resolved.

2.4 Cyclone and storm surge design

DPIFM have stated that due to the high probability of cyclonic activity in the region, all site infrastructure including sea containers should be built and operated in accordance with the relevant cyclone coding.

Matilda acknowledges this and confirms that all site infrastructure including sea containers will be built and operated in accordance with the relevant cyclone coding.

DPIFM have asked what height above sea level the infrastructure at both sites will be constructed, and if it is sufficient for storm surge protection.

The principal infrastructure at both sites (the camp, processing plant, fuel and mineral sands concentrate storage facilities) will be constructed on the plateau above the beach plain, at approximately 10 to 12 m

above sea level and inland of the proposed mining area. It is considered that the height and distance from the shore line is sufficient to protect the facilities from storm surge.

2.5 Environmental management

DPI states that the Draft EIS adequately identifies and assesses the environmental and related impacts associated with the development of the Andranangoo Creek West and Lethbridge Bay West mineral sands deposits. The various management strategies proposed are adequate to manage and mitigate those impacts.

Matilda thank DPI for their positive comments.

The EPA's Environmental Management - Operations Unit do not have any comments on the Draft EIS. The waste, hazardous materials and water management sections (and EMPs) of the EIS have been satisfactorily covered.

Matilda thank EPA for their positive comments.

2.6 Waste management

DPIFM ask if consideration has been given for a collective waste management strategy, whereby consumable wastes and camp wastes are managed in a consistent manner.

In response to concerns expressed in the EIS consultation process, Matilda has amended its waste management strategy. All kitchen and office wastes will be removed from site and taken to Tiwi Islands Local Government landfill sites for disposal. Wastes that have been identified as non suitable for Island disposal (such as hydrocarbon impacted wastes) will be collected for mainland disposal. A waste tracking system will be implemented so that all wastes can be tracked from generation to ultimate disposal.

An existing waste collection and disposal program is in place on the Tiwi Islands for Australian Fuel Distributors (AFD), forestry and other activities on the Islands. Matilda propose to use the same contractors. A copy of the revised EMP framework for waste management is provided below.

Table 2: Revised Waste Management Program

Objectives and Targets	To minimise and mitigate potential environmental impacts associated with the generation and disposal of waste from the proposed operations. To promote the efficient use of resources and minimisation of waste generation and disposal.
Actions	• Domestic type waste arising from the camp (including kitchen and office waste) will be collected in 200 L drums, and removed from site and taken to Tiwi Islands Local Government landfill sites for disposal. • Miscellaneous vehicle waste (tyres, batteries, scrap parts) will be collected for return to Darwin for appropriate recycling and / or disposal. • Waste oil will be collected in 200 L drums identified as waste oil, and other oily wastes including generator set oil, oil filters and rags will also be placed in 200 L drums identified as oily wastes. On site these wastes will be stored on the fuel storage bund. AFD will then take waste oil off site for storage at the oily waste storage facility at Port Melville before shipping to the mainland for appropriate disposal. • Any chemical waste (very minor quantities) will be collected in a 200 L drum identified as chemical waste. It is proposed that these wastes will be taken to Port Melville for collection by a waste recycling and disposal contractor (Drum Muster). • The septic tank system with associated soakage trench for the camp kitchen and ablution areas will be covered and appropriate chemicals applied to reduce the chance of spread of disease and the likelihood of a mosquito breading ground. • Tailings from the process will comprise clean sand rejected from the minerals separation process. All clean sand tailings will be returned to the previously mined areas for rehabilitation.
Monitoring	• Inspections of waste facilities will be conducted on a weekly basis. • Inspections of septic systems will be undertaken as per manufacturer requirements.
Reporting	The Environment Coordinator will record and sign off on monthly inspections of waste management and septic systems • The results of Matilda's waste management program will be documented in Matilda's Annual Report of performance against the MMP. • Where an incident causes or threatens to cause pollution resulting in material or serious environmental harm the EPA must be informed within 24 hours of becoming aware of the incident as per the requirements of the *Waste Management and Pollution Control Act 1999*.
Corrective Actions	The following constitute incidences or failures to comply in relation to waste management policies: • Unnecessary volumes of waste being sent for disposal. • Wastes being disposed of rather than reused or recycled where possible. • Uncontrolled waste disposal. • Other non-compliances with the waste management plan. • Surface water or groundwater contamination. Should an incident or failure to comply occur, Matilda will: • Take the necessary actions to identify the causes of non-conformance with the waste management plan performance requirements. • Implement all actions necessary to ensure compliance. • All incidents will be reported and managed through to resolution via Matilda's incident reporting procedures.

Relevant Legislation and Standards	• Matilda's Environmental Policy. • *Mine Management Act 2001.* • *Litter Act 1972.* • *Waste Management and Pollution Control Act 1999.* • *Mine Management Act 2001.*

The ECNT have asked if Matilda have examined the use of dry/compostable toilets and other waste treatment options other than what was outlined in the EIS.

Other waste treatment options have not been considered. The option outlined in the Draft EIS was developed in consultation with the TLC to ensure that the proposed treatment option is suitable and that the proposed Waste EMP framework (revised in Table 2 above) is contextually appropriate to the Tiwi Islands.

The use of septic tanks is recommended for camps of less than 20 personnel in Environmental Health Information Bulletin No 6 *Requirements for Mining, Construction & Bush Camps (2006),* issued by the DHCS. The design of the septic tank system would be in accordance with the NT *Code of Practice for small on-site sewage and sullage treatment systems and the disposal or reuse of sewage effluent (1998).*

Matilda has based its EMS on ISO14001, which is a continuous improvement system. New methods for the management of environmental issues will be assessed and revised to ensure improvements are made where appropriate throughout the operation of the mining area.

2.7 Water use and management

DPIFM believes that consideration should be given to the development of a water budget for process and waste water for a worst case (1 in 3 year, 72 hour) rainfall event in saturated conditions. DPIFM believes that this would assist Matilda to quantify potential excess water generated by the extraction and dewatering of sands in such conditions. Subsequently, the feasibility and requirements to implement the control strategy to irrigate excess water would be better anticipated for extreme events.

There will be no dewatering associated with the proposed sand mining operations (described in Section 2.2 of the Draft EIS), and thus there will be no irrigation of excess water. Conventional mining using dewatering was initially proposed, but this was changed during the consultation process (Section 1.7.3)

Matilda will schedule to mine areas of the deposit where the water table is lowest during the wet season, and areas of the deposit where the water table is closest to the surface during the dry season.

In event of a worst case scenario as described, mining operations would be suspended until excess water from the mining area had dispersed. Given the highly permeable nature of the sands, this would be expected to be a comparatively short period, i.e. a few days at most.

DPIFM have asked if the estimated 7ML per year of untreated water considers potential issues impacting on recovery of water such as infiltration losses, actual storage capacities, slurry densities, and sand filled sumps.

The figure of 7 ML /year in Section 2.3 is a typographic error; the figure should be 307ML /year, as described in the Draft EIS in Section 8.3.1, where it is stated that it is anticipated that 840 kL/day (307 ML/year) will be required for the processing. This typographic error is noted in the Errata in Appendix B.

The figure is an overall estimate and includes infiltration and other losses, and inventories.

The ECNT have asked if there is a limit on the number of production bores to be established.

The number of production bores required will depend on pumping tests to be undertaken following bore drilling. The test work undertaken to date indicates that two production bores at each site will be adequate to provide the required process water supply.

The ECNT have asked if the impacts of utilising 7ML of groundwater for processing and mining activities, and 7.3ML for dust suppression, have been identified.

The impacts are comprehensively assessed in Chapters 7 and 8. As noted above, the figure of 7 ML /year in Section 2.3 is a typographic error; the figure should be 307ML /year, as described in the Draft EIS in Section 8.3.1. This typographic error is noted in the Errata in Appendix B.

2.8 Environmental health management

DHCS refer Matilda to Environmental Health Attachment – Information Bulletin No. 6 Requirements for Mining, Construction & Bush Camps.

Matilda thank the EPA for providing the *Information Bulletin No 6 – Requirements for Mining, Construction and Bush Camps* (March, 2006). Matilda will review the guidelines when developing the EMPs. It is noted, however, that the camp will have less than 20 persons at any one time.

2.9 Hydrocarbon management guidelines

The EPA has asked for Matilda's Hydrocarbon Management Guidelines, referred to at ES-25, and p25-9.

A copy of Matilda's Hydrocarbon Management Guidelines is presented in Appendix C.

2.10 Generators

The ECNT notes that five generators are proposed.

This is correct. The use of separate generators for the camp, mine, potable water bore and two production bores will avoid the need for power cables between these areas.

3.1 Relevant Government legislation

The AAPA have noted that the Aboriginal and Torres Strait Islander Heritage Act 1984 and the Aboriginal Land Rights (Northern Territory) Act 1976 are Commonwealth, not Northern Territory legislation. Also, the Northern Territory Aboriginal Sacred Sites Act 1989 should be added to the list of relevant legislation.

DHCS points out that the Foods Act (2004) was omitted from the list of relevant legislation.

DPI has noted that the Marine Act and the Marine Pollution Act have been omitted from the list of relevant legislation.

The following is an amended list of Northern Territory and Commonwealth government legislation:

Northern Territory Legislation

- *Aboriginal Sacred Sites Act 1989*
- *Bushfires Act 1980*
- *Dangerous Goods Act 1981*
- *Environmental Assessment Act 1982*
- *Fire and Emergency Act 2004*
- *Food Act 2004*
- *Heritage Conservation Act 1991*
- *Litter Act 1972*
- *Local Government Act 1993*
- *Marine Act 2005*
- *Marine Pollution Act 2004*
- *Mining Act 1980*
- *Mining Management Act 2001*
- *Motor Vehicles (Standards) Regulations - Australian Vehicle Standards Rules*
- *Northern Territory Aboriginal Sacred Sites Act 1989*
- *Parks And Wildlife Commission Act 2004*
- *Planning Act 2003*
- *Public Health Act 1952*
- *Radiation (Safety Control) Act 1999*

- *Soil Conservation and Land Utilisation Act 1980*
- *Territory Parks and Wildlife Conservation Act 2001*
- *Traffic Act 1949*
- *Waste Management and Pollution Control Act 1998*
- *Water Act 1991*
- *Water Supply and Sewerage Act 1988*
- *Weeds Management Act 2001*
- *Work Health Act 1986*
- *Plant Diseases Control Act 1979*
- *Biological Control Act 1986*

Commonwealth Legislation

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Aboriginal Land Rights (NT) Act 1976*
- *Assessment of Site Contamination NEPM 1999*
- *Environmental Protection and Biodiversity Act 2000*
- *Industrial Chemicals (Notification and Assessment) Act 1989*
- *Motor Vehicle Standards Act 1989*
- *National Strategy for the Conservation of Australia's Biological Diversity 1996*
- *Native Title Act 1993*
- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*
- *Parks and Wildlife Conservation Act 2005*
- *National Strategy for the Conservation of Australian Species and Communities Threatened with Extinction*

3.2 AAPA approval

Currently, the AAPA has not received an application for Authority Certificates for the proposed works from Matilda. AAPA has conducted preliminary discussions with the TLC on issuing Authority Certificates, however currently, no reports have been received. Proof of an Authority Certificate is required before the project can commence.

It is understood that the Tiwi Land Council (TLC) has written to the AAPA (letter dated 16 December 2005 and referenced File: 14-5-0) providing authorisation to issue an Approval Certificate under the Northern Territory Aboriginal Sacred Sites Act 1989.

It was noted that a burial site is known to occur in the vicinity of the mine; however, a site visit could not locate it and indicated it was unlikely to be within the area proposed for disturbance. Extensive consultation has been conducted with the Traditional Owners with regard to this issue. If evidence of a burial site is discovered during operations, operations will cease immediately and the TLC will be notified as soon as possible. This procedure is discussed in Section 20.1.2 of the Draft EIS.

3.3 Mining approval

The ECNT does not support the proposed mining operations on the Tiwi Islands and believes they should be rejected by Government. The ECNT believes that this project would set a precedent for sand mining on the Tiwi Islands coast which would result in a large number of mines being developed with substantial cumulative impacts over a very large area. The ECNT also believe that there are too many risks to many important values, and too many questions as to the long-term cost-benefit of the mines to the local island communities, for the project to proceed.

The ECNT recommends that the proposed mines not be approved.

The ECNT opinions and comments are noted, however the sentiments expressed are not supported by Matilda. Matilda has conducted extensive liaison with TLC and the NTG, in order to develop a project that properly addresses any environmental issues that may arise from the project.

As a result of these consultations, a number of changes to the project were made during the compilation of the Draft EIS, and these are described in Section 1.7.3 of the Draft EIS. During the Draft EIS review process, further project changes have been identified in response to comments received, and these are described in Section 1.5 of this Supplement.

It is noted that the TLC are fully supportive of the project. Matilda has committed to upgrading roads and other facilities to help and support the local community, and has consulted to ensure that any infrastructure to be left following Matilda's departure will be beneficial to the Tiwi community.

Matilda has conducted a comprehensive EIS process and has developed a series of management plans to protect and record local fauna and flora to add to the knowledge available for the Island.

The ECNT believe that any proposals for further mines should be subject to a full EIS, and only considered by the Government upon completion of the Matilda project, and auditing and reporting has been undertaken.

The ECNT has expressed major concerns regarding mining mineral sands on the Tiwi Islands, and notes that Matilda has identified other deposits on the Islands. In addition other companies may have identified, or be seeking to identify, further exploitable deposits.

The ECNT state that the most serious problem that could emerge is multiple mines operating simultaneously across hundreds of kilometres of Tiwi coastal environment with widespread impacts and chronic lack of resources for thorough ongoing independent monitoring of those mines and mining impacts and compliance auditing.

The ECNT comments are noted. The approval process for any future mineral sands mining on the Tiwi Islands is a matter for the NTG, and also the Commonwealth should the EPBC Act be triggered.

It is expected that the NTG and the Commonwealth would consider potential cumulative impacts in their decision-making process. However it is noted that Matilda's proposed operations are relatively small in scale, and the potential impacts are very localised. As such, even if more similar projects were to occur, it is not expected that cumulative impacts would be an issue.

Matilda has granted or applied for Exploration tenements covering all prospective areas for mineral sands mining on the Tiwi Islands; thus it is unlikely that other potential operators would establish mineral sands mines in the Islands. Matilda proposes to only mine prospects sequentially on Melville Island, although potentially on both islands if current exploration is successful on Bathurst.

As the mining process includes a continuous rehabilitation program, the effectiveness of rehabilitation will be able to be measured during the progress of mining at each site. The MMP will include an annual report which will document rehabilitation progress, and which will be scrutinised by DPIFM.

The ECNT believes that no more than one sand mine should operate at any one time. Before a second mine commences, an open and transparent audit of the first mine should be conducted and published, with non-conformances penalised and approval for the second mine withheld if serious breaches are found.

Matilda proposes mining at Andranangoo, followed by mining at Lethbridge. The life-of-mine at Andranangoo is expected to be approximately three and a half years, and at Lethbridge approximately six months. Following the EIS process, a Mining Management Plan (MMP) will be submitted to DPIFM. The MMP will incorporate environmental management measures arising from the EIS process. The MMP process will establish the operating conditions for the operations. The MMP will be audited by DPIFM on an annual basis.

The ECNT recommend that strong conditions be placed on the mining operations and Matilda that are clear, legally binding and enforceable.

The ECNT comments are noted. This is a matter for the NTG.

4.1 Topography

The EPA has asked if the resultant post-mine soil level equates to a depression that would affect the drainage characteristics of the area. Also, to what extent would the soil type (sand?) negate the effects of such topographical changes.

The area to be mined is within the narrow coastal plain which comprises a series of shore-parallel ridges and swales. The strands to be mined are located on local topographic highs, between 3 and 5 m above sea level. Mining will reduce the elevation by an average of 0.15 m. The surface profile of the backfilled pits will be shaped to maintain pre-mining surface flow paths, however, the sandy nature of the site is such that most drainage will be by infiltration rather than surface flow.

The EPA has asked how high the resultant landforms will be after mining, relative to the year's highest High Tide levels.

Tidal data for waters immediately adjacent to the mining sites are not available. The nearest site for which tidal predictions are available is Snake Bay, located on the northern coast of Melville Bay.

HAT (Highest Astronomical Tide) is the highest tide level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions; these levels will not be reached every year. HAT is not the extreme level which can be reached, as storm surges may cause considerably higher levels to occur. At the Snake Bay tide site, HAT is 3.1 m above LAT (Lowest Astronomical Tide). MSL (Mean Sea Level) Snake Bay is 1.7 m above LAT, i.e. the HAT is 1.4 m above MSL.

As noted above, the strands to be mined are located on local topographic highs, between 3 and 5 m above MSL, and mining will reduce the elevation by an average of 0.15 m. Based on the Snake Bay data, assuming that the HAT at the proposed mine sites is of order 1.4 m above MSL, it is expected that the final landform will be well above the HAT levels.

The EPA have asked for a high resolution topographical map of the mine and camp areas with an overlay of the proposed mining areas and buffer zones, mine infrastructure, bores, landform features, maximum Spring high tide levels and as accurate scale.

Maps of the two sites with more detail of the mine and camps areas, including topographical information, can be provided to EPA separately. These maps are too large for inclusion in the EIS documentation.

More detailed maps and plans will be included in the MMP documentation to be submitted to DPIFM following the EIS approval process.

4.2 Risks to coastal environment

The ECNT state that the mines would operate in locations with serious inherent problems and risks: very close to (or on top of) fragile coastal, beach, dune and wetland environments and in a region prone to cyclones, storms and high tides. A combination of high tides and storm surges or cyclonic activity would see these low-lying mines inundated with potentially serious erosion and contamination implications.

As noted in Section 4.1, the strands to be mined are located on local topographic highs, between 3 and 5 m above MSL, and mining will reduce the elevation by an average of 0.15 m. Based on the Snake Bay data, assuming that the HAT (Highest Astronomical Tide) at the proposed mine sites is of order 1.4 m above MSL (Mean Sea Level), it is expected that the final landform will be well above the HAT levels.

It is thus considered unlikely that the mining area would be affected by high tides. As noted in the Draft EIS, the minerals processing plant and camp will be located on the plateau above the beach, which will provide additional protection against storm surge, as well as reducing noise and light impacts on sea turtles. The plateaux above the Andranangoo and Lethbridge sites are well above the beach plain, and the processing plant and camp sites will be at a level of +10 m AHD.

During cyclone events, mining would cease, all mobile mining plant would be moved the plateau, and personnel would be evacuated. There would be no potentially contaminating materials left within the beach plain during the passage of a tropical cyclone. Should any damage to the mining area or to recently rehabilitated area occur during a cyclone or storm surge event, Matilda would undertake the necessary rehabilitation works in these areas in accordance with the Rehabilitation and Mine Closure Plan, described in Section 21 of the Draft EIS.

4.3 Buffer zones

The ECNT would like clarification of the term "in general" with regard to the width of the buffers between the mining operations and the beaches where turtles may nest and areas of sensitivity such as mangroves or rivers. ECNT tates that the use of the term "in general" is unacceptably vague. The ECNT believe that ecologically based, mandatory and enforceable minimum buffer widths are required to protect beach areas, wetlands, vine thickets, mangroves, riparian areas and other sensitive and high conservation value ecological communities. The ECNT note that under the NT 2002 Land Clearing Guidelines, minimum recommended buffer widths are 200m for wetlands, 100m for creeks, and 250m for rivers. The ECNT believe that these widths should be complied with on the Tiwi Islands.

The ECNT believe that no ambiguity should exist as to the requirement for legally enforceable buffer widths at each of the project sites and the width of those buffers.

The ECNT believe that the adequacy of the proposed buffers should be independently reviewed and increased.

The ECNT believe that all wetlands should be protected from the impacts of mining, and a protective buffer of at least 100m be placed around all wetlands in the vicinity of the mines.

The EPA would like clarification on the proposal to divert flows from an existing spring at Andranangoo. The Draft EIS states a 50m buffer from waterways. Diverting this waterway is not a 50m buffer from waterways.

NRETA have recommended that buffer widths around water bodies should be based on stream order with 50m being the bare minimum for first order (unbranched) drainage lines. Buffer widths around sensitive vegetation communities should be at least 100m.

In response to comments received on the Draft EIS, Matilda has made amendments to the proposal as set out in the Draft EIS. The revised buffer zones are as set out below:

- A buffer zone of 50 m will be maintained from rivers, creeks and wetlands areas;
- The buffer zone from mangrove areas will be increased from 50 m to 100 m;
- The sea turtle buffer zone of 200 m is retained;
- No mining will be undertaken in Vine Thicket areas; and
- No mining will be undertaken in the drainage line from the escarpment spring in central Andranangoo Creek Project Area. It is noted that a 50 m buffer is not feasible in this area. Surface drainage management methodologies described in Section 7 of the Draft EIS will be implemented to minimise impacts in this area.

It is noted that the land surface will be rehabilitated and revegetated post mining, and any disturbance is short-term rather than permanent in nature.

NRETA have recommended that, in relation to Figure 11.1, maps should explicitly indicate where the proposed 200m turtle buffer intersects mineral zones, and explicitly indicate that no mining will take place within these intersections.

The EPA has asked if the 200m turtle buffer extends beyond the highest tide level.

As noted in Section 4.1, maps of the two proposed sites with more detail of the mine and camps areas, including topographical information, will be included in the MMP documentation to be submitted to DPIFM following the EIS approval process. These maps will depict the buffer zones.

The proposed 200 m turtle buffer zone extends from the High Water Mark (i.e. Mean High Water Springs or Spring High Tide Mark as described in the Draft EIS). Note this is lower than the HAT level; HAT level will not be reached every year.

4.4 Acid Sulphate Soils

As the grinding of samples prior to ASS testing can make available the calcium carbonate from shells, therefore skewing the potential acid results, DPIFM would like clarification of the sampling procedure.

Appendix B in the Draft EIS (Section 4.4) contains details of the laboratory testing of the samples for suspension peroxide oxidation - combined acidity and sulphate analysis (SPOCAS) after Ahern *et al*, 2004 (Acid sulfate Soils - Laboratory Method Guidelines).

Matilda recognises that the TPA method can underestimate the net acid risk likely due to using a finely-ground sample. The methodology however accounts for this by dividing all measurements of the neutralising material by a fineness factor during acid base accounting.

The samples collected in the field and subsequently sent to the laboratory for analysis were generally orange in colour and comprised of quartz sand.

DPIFM have noted that sampling and analyses infers that the risk of disturbing potential ASS in the resource area is low, and that sediments proximal to wetlands and mangroves have higher probability to oxidise to acid conditions. The depth of extraction relative to the groundwater table has also been discussed with regard to ASS risk.

Matilda agree with DPIFM's observations, in regard to low ASS in the resource areas, and that sediments in proximity to wetlands and mangroves have a higher probability to oxidise to acid conditions. Matilda will avoid mining in these latter areas. As noted in Section 4.3, a buffer zone of 50 m will be maintained from rivers, creeks, wetlands and damp plain areas, and the buffer zone from mangrove areas will be increased from 50 m to 100 m.

The ECNT believe that mining should not go ahead until all acid sulphate issues have been identified and resolved, and when it has been established that there is no significant risk of ASS impacts.

The ECNT have recommended that acid sulphate risks should be clearly established prior to commencement of operations. If it is established that there is risk of significant acid sulphate impact, the Centre believe that mining should not proceed.

The soils at Andranangoo have been assessed for ASS potential, as described in the previous response, and it is concluded that this potential is low. Matilda has made a commitment (Section 5.5 of the Draft EIS) to investigate the possible presence of ASS at Lethbridge as part of more detailed site work prior to mining being undertaken. As also noted above, Matilda will avoid mining in proximity to wetlands and mangroves, which have a higher probability of presence of sediments that may oxidise to acid conditions.

4.5 Humus acidification

DPIFM have noted that the EIS does not mention if there are organic humic layers that may be disturbed by the mining activities that can generate acid upon exposure. It is also noted that a reference to whether samples collected during exploration contain any humus, and a strategy to recognise and manage such sediments should they be encountered would be beneficial, particularly if in the event that recently deposited sediments need to be disturbed below the lowest historical standing water table level.

Humic layers were encountered at Andranangoo West (Bores MM2, 3, 6, 8, 7P, Site 8 and Camp Bore) and Lethbridge West (Sites 2, 3, 8 9P and Camp Bore) (Appendix B of the Draft EIS) at depths generally less than 1 m below ground level. The shallowest end of dry season groundwater level recorded at Andranangoo West was 1.68 m and at Lethbridge West 1.65 m. As the humic layers are located above the lowest recorded water level for the bores drilled, it is likely that these layers have already oxidised.

4.6 Fire

NRETA have stated that the establishment of 15m wide fire breaks around the camp and processing areas is not consistent with best practice and will cause unnecessary damage to vegetation, increase the potential for weed invasion and soil erosion, and will require an increase in the effort, costs and time for rehabilitation. NRETA suggest that a cheaper, easier and less damaging approach is back-burning from an established (cleared and slashed rather than graded) "control line" under appropriate conditions. The cleared / slashed line does not need to be any wider than that necessary to provide for vehicle access.

Matilda agrees with this and will amend the Fire Environmental Management Plan to reflect the use of back burning rather than vegetation clearing. However, around infrastructure areas larger trees will be cleared to provide protection in the event of a cyclone.

5.1 Surface water management

The ECNT have asked if the impacts of excess water from the concentrate dewatering cyclone discharged behind the active mining zone have been identified.

It is not considered that there will be any impacts from excess water being discharged behind the active mining site. This statement is made based on 90% of the water being recycled through the feeder concentrate as shown in Figure 8.4 of the Draft EIS. Figure 2.2 also refers. As noted in Figure 8.4, 10% (15m^3 per day) will be placed in the sump area behind the mining area. It is further noted that a pump will be installed in the sump such that any excess water will also be recovered and recycled.

Assuming the area of the sump is 800m^2 (80m width and 10m lateral thickness for each proposed mining slot), the increase in groundwater level as a result of the 10% of water being returned to the groundwater is approximately 2 cm per day. This quantity of water is less than the infiltration rate of the sand material to which the water will go into, and therefore there will be no adverse affects.

Groundwater contamination as a result of returning this water is also not expected, given that the mineral separation is a physical and not a chemical process, and no chemical additives are used. It is therefore expected that groundwater quality will be similar to that when it was abstracted.

5.2 Flood and erosion management

NRETA note that the water issues expected from the mining operation are:

- Potential flooding and drainage of the mining area, and more frequent flooding due to lowering the landform in the mining area by approximately 150 mm.

As discussed in Section 4.1, the area to be mined is within the narrow coastal plain which comprises a series of shore-parallel ridges and swales. The strands to be mined are located on local topographic highs, between 3 and 5 m above sea level. Mining will reduce the elevation by an average of 0.15 m.

The increased potential of flooding in the areas of mining due to lowering the landform by 150 mm is discussed in Sections 7.3.2 and 7.3.3 of the Draft EIS respectively for the Andranangoo and Lethbridge sites. Management measures identified are included in Section 7.4 of the Draft EIS and include mining slot drainage and diverting flows around the mining area. These measures will separate surface water flows in the catchment from the mining area and provide flood protection to the mining area.

- Increase in the volume of runoff due to removal of vegetation.

The potential issue of increase in surface water volume is addressed in Section 7.3.1 of the Draft EIS, and the volumes were provided in Table 7.8. The estimated increase in flow at the Andranangoo site is 0.17 GL/a, which is 0.11% of the catchment estimated annual flow. The estimated increase in flow at the Lethbridge site is 0.17 GL/a, which is 0.12% of the catchment

estimated annual flow. These increases are not considered significant, in the context of annual variation.

- ***Increase in the amount of erosion caused by removal of vegetation, and in the area of the drains around and downstream of the mining area, which could impact on nearby receiving environments.***

Measures to minimise erosion to downstream waterways are comprehensively covered in Sections 7.3 and 7.4 of the Draft EIS. General issues and impacts are described in Section 7.3.1; site specific issues related to erosion and deposition into the nearby spring, tidal dunes, damplands/wetlands and mangroves is discussed for the Andranangoo site in Section 7.3.2, and for the Lethbridge site in Section 7.3.3.

Management measures for the landform including drainage and buffer zone are included in Section 7.4.1 of the Draft EIS, and erosion and drainage measures including drainage in the mining slot, diversion around the mining area, buffer zones, haul road measures and stockpile measures are detailed in Section 7.4.2. Soil erosion monitoring is proposed at both sites to identify where erosion and deposition is occurring and to assess the effectiveness of the management measures.

- ***Potential water quality issues arising from deposition of eroded sediments into nearby waterways.***

As per the previous point, this issue is addressed in Sections 7.3 and 7.4 of the Draft EIS. Section 7.4.3 discusses the measures to mitigate impacts upon water quality, in particular the use of buffer zones. As discussed in Section 4.3 of this Supplement, the buffer zone for mangrove areas has been increased to 100 m. A buffer zone of 50 m will be maintained from rivers, creeks, and wetland areas surrounding the mine.

- ***Water quality impacts.***

As per the previous point, this issue is addressed in Section 7.3 and 7.4 of the Draft EIS. The potential impacts that may affect water quality are potential for erosion, suspension and deposition of sediments. The impact of deposition for the Andranangoo and Lethbridge sites are discussed in Sections 7.3.2 and Section 7.3.3 respectively, and management measures including soil erosion monitoring at the sites is detailed in Section 7.4.2. Water quality monitoring, rainfall monitoring and flow monitoring are also described in Section 7.4.3, Section 7.4.4 and Section 7.4.5 of the Draft EIS.

NRETA states that the Draft EIS has detailed a number of management measures to prevent or minimise the potential impacts (pages 7-16 to 7-24), and these are acceptable. However the design criteria for flooding and drainage of the mining area is based on a 5 year ARI, and no indication has been made of any flood management measures in the mining area during a major flood (50 and 100 year ARI).

Modelling for a five year ARI scenario only was completed, which reflects in part the short-term nature of the project (mining will occur at Andranangoo and Lethbridge for only a four to five year period). It is accepted that a larger rainfall event could however occur. In the event of larger events (which are most likely to occur in the wet season during a cyclone event) the site would be closed, secured and staff evacuated. Once the event was over, staff would return to conduct any necessary re-construction works.

As described in Section 4.1 above, the area to be mined is within the narrow coastal plain which comprises a series of shore-parallel ridges and swales. The strands to be mined are located on local topographic highs, between 3 and 5 m above sea level. Mining will reduce the elevation by an average of 0.15 m. This topographic elevation of the mining areas would mitigate any potential flooding impacts.

5.3 Water monitoring for hydrocarbons

DPIFM have asked if hydrocarbon monitoring is proposed as part of the water monitoring program, as systematic small spillages have a high probability of occurring around refuelling areas.

Matilda confirms that should hydrocarbon spillage occur, appropriate monitoring would be conducted. Section 7.4.3 of the Draft EIS provides guidelines for observing and photographing hydrocarbon storage areas following rainfall events, and clean up-procedures. In the event that a significant spill should occur, monitoring for hydrocarbons in surface and groundwater would also be conducted.

5.4 Impact on water regimes

The ECNT feel that both mining location could cause significant impacts on fresh and salt water regimes, as much of the identified resource is less than 200m from either beach or wetlands. At Lethbridge mine, the deposit is between a large wetland and the beach, in a narrow stretch of lowland. In the case of Andranangoo Ck, the proposed mining is in a mostly very narrow belt of old shoreline/dunes between the 'tertiary uplands', wetlands, and the beach. In both cases, mining in these locations could cause significant impacts on water regimes involving both fresh and saline water.

The ECNT believe that a proposed 50m buffer between the mining operations and wetlands (described in the Draft EIS as 'damp plains' and 'brackish swamps') is not adequate.

The ECNT feel that the Draft EIS is unacceptably vague in identifying and describing the hydrological connection between the wetlands and the coast, and that these important connections need to be well understood and documented before any approval is considered.

The potential impacts to the surface water regime have been described in Section 7.3 and management in Section 7.4 of the Draft EIS. A small increase is expected in the volume of surface water generated at both sites due to vegetation clearance and increased erosion could occur. The estimated increase is 0.11-0.12% of the catchment flow and is considered minor.

The soil at the sites is a fine to medium grained sand with little clay content (Table 5.1 of the Draft EIS); this soil structure enhances infiltration, reducing potential impacts to downstream waterways (mangroves, damplands/wetlands). To minimise potential impacts to flow regimes, surface flows will be diverted around the mining area; the area of cleared vegetation will be minimised; and buffers maintained between the mining area and downstream waterways. Monitoring of the surface water quality prior to, during and following mining activities will assess the impact on surface water quality.

The potential impacts to the groundwater regime, which may have a potential impact on the surface water regime, have been described in Section 8.3 of the Draft EIS. Some drawdown of groundwater levels is expected to occur around the process water bores at the site.

Field investigations and groundwater modelling of the Andranangoo site has been conducted as part of the EIS study, and it is predicted that the groundwater drawdown will not cause salt water intrusion from the beach. The drawdown is expected to lower groundwater levels in an existing waterhole (near MM2) and an existing perennial spring (near MM2) by 0.1m, i.e. a minimal amount.

It is noted also that the impact to the groundwater flow regime is expected to be minor and temporary during the estimated three and a half years of mining activities at Andranangoo and six months at Lethbridge. It is expected these impacts will cease the following wet season after the completion of mining activity. At Lethbridge groundwater modelling is proposed, with impacts expected to also be minor and temporary during the short estimated mining period.

Monitoring of groundwater levels and quality prior to during and following mining activities will assess what groundwater drawdown is occurring and the impact on groundwater quality.

The potential impacts to flora from the change in flow regime have been described in Section 9.3 of the Draft EIS. Drawdown of groundwater from production bores are in areas of *Melaleuca* woodland, and this drawdown is not anticipated to have significant or long term impacts or mortality to the woodland. Buffer zones will be established between the mining areas and the damplands/wetlands of 50m and within 100m of mangroves. Mining will not occur in coastal vine thicket areas.

6.1 Groundwater management

DPIFM have mentioned that the EIS should address options to manage septic waste if ground conditions become unstable to receive this waste stream due to flooding. It was also mentioned that groundwater contamination is also a risk if the evapo-transpiration potential at soakage trenches is exceeded by groundwater recharge, surface flow during rain, and septic inputs. It is suggested that the potential issues associated with managing sewage in areas that have extreme rainfall events and elevated water tables be addressed, as they can be problematic.

The Draft EIS Section 7.3.1 identifies the potential for surface water to become contaminated if septic systems flood. The Waste Management section of the Draft EIS Section 17.1.2 describes that up to 15 operational personnel and contractors will be on site at any one time. The proposed Andranangoo and Lethbridge camps are located on the plateaux above the escarpment, at +10 m AHD.

Boreholes have been constructed at both locations and the following is noted from the borehole logs:

- Andranangoo: Sand is present to a depth of 4m underlain by Sand/Clay. Groundwater was noted at a depth of 3.1m.
- Lethbridge: Sand is present to a depth of 2m underlain by Sand/Clay. Groundwater was noted at a depth of 15.6m.

For both sites a septic system in the sand is considered appropriate. The elevated location of the camps and the presence of the sand strata suggest that there will be adequate drainage for surface water and little risk of flooding. The septic tanks would be above the groundwater and this would also minimise the potential for groundwater impacts.

The design of the septic tank system would be in accordance with the NT *Code of Practice for small on-site sewage and sullage treatment systems and the disposal or reuse of sewage effluent (1998).*

The ECNT express concern that any excess water would be discharged behind the active mining zone, from where it would rapidly seep back into the watertable.

As described in Section 5.1 of this Supplement, it is not considered that there will be any impacts from excess water being discharged behind the active mining site. This statement is made based on 90% of the water being recycled through the feeder concentrate, as shown in Figure 8.4 of the Draft EIS. As noted in Figure 8.4, 10% ($15m^3$ per day) will be placed in the sump area behind the mining area. It is further noted that a pump will be installed in the sump such that any excess water will also be recovered and recycled.

Assuming the area of the sump is $800m^2$ (80m width and 10m lateral thickness for each proposed mining slot) the increase in groundwater level as a result of the 10% of water being returned to the groundwater is approximately 2 cm per day. This quantity of water is less than the infiltration rate of the sand material to which the water will go into, and therefore there will be no adverse affects.

Groundwater contamination as a result of returning this water is also not expected, given that the mineral separation is a physical and not a chemical process, and no chemical additives are used. It is therefore expected that groundwater quality will be similar to that when it was abstracted.

The EPA has asked if pit dewatering will be required in periods of high seasonal rainfall, and if it will be possible to stay above the watertable if a high rainfall wet season occurs.

As described in Section 1.7.3 of the Draft EIS, the proposed mining methodology has been changed such that dewatering is not to be undertaken. Mining may occur at limited depths below the water table where shallow water tables exist, however pit dewatering will not be implemented.

Matilda will schedule to mine areas of the deposit where the water table is lowest during the wet season, and areas of the deposit where the water table is closest to the surface during the dry season.

NRETA note there are no groundwater issues associated with the operation. These issues have been adequately addressed in the Draft EIS.

Matilda thanks NRETA for their positive comments.

6.2 Groundwater monitoring

DCHS Tiwi Health Services (Environmental Health Officer) would like to be informed of Matilda's monitoring of groundwater levels and quality before and during the project.

Pre-mining groundwater levels for Andranangoo and Lethbridge Deposits are described in Section 8.1.5 and presented in Figures 8.2 and 8.3 in the Draft EIS. Table 1, Appendix B of the Draft EIS, also present the groundwater levels. Pre-mining groundwater quality is presented in Section 8.1.6 in the Draft EIS.

Matilda has made a commitment to monitoring groundwater quality and levels during the operation of the project (Section 8.5) and will include the results in their annual Mine Management Plan (Section 25.4 of the Draft EIS). Matilda will also provide copies to the Environmental Health Officer.

DPIFM have recommended that consideration be given to identifying the source of elevated TDS from groundwater bore 1(P). If the elevated TDS is found to be due to Fe^{2+}, this analyte should be included in future monitoring programs.

Matilda has made a commitment (Section 8.5 of the Draft EIS) to monitor groundwater quality prior to commencement, during and following the completion of mining activity. These monitoring programmes will undertake comprehensive chemical analysis, which will determine the likelihood of the elevated TDS from production bore Site 1(P). SPOCAS testing near Site 1(P) indicated the sulphur trail was below the limits of recording (less than 0.02 % sulphur), therefore the presence of sulphur near the vicinity of Site 1(P) is limited.

DPIFM have asked if hydrocarbon monitoring is proposed as part of the water monitoring program, as systematic small spillages have a high probability of occurring around refuelling areas.

As noted in Section 5.3, Matilda confirms that should hydrocarbon spillage occur, appropriate monitoring would be conducted. Section 7.4.3 of the Draft EIS provides guidelines for observing and photographing hydrocarbon storage areas following rainfall events, and clean up-procedures. In the event that a significant spill should occur, monitoring for hydrocarbons in surface and groundwater would also be conducted.

6.3 Groundwater drawdown

The ECNT believe that there has been inadequate discussion of drawdown impacts from groundwater use on all ecosystems including vine thickets, wetlands and mangroves.

The ECNT believe that more information is required on the potential impacts of drawdown on all ecosystems and vegetation types, including vine thickets, wetlands and mangroves.

The ECNT note that groundwater drawdown at Andranangoo will be 0.4m at 100m distance from production bores, and there will be a lowering of water levels at a nearby spring at an earlier time in the dry season, whilst the sand mining operations occur. The ECNT have asked if the nearby wetlands/damplands will be affected by the groundwater drawdown at Andranangoo.

As described in Section 5.4 above, issues associated with groundwater drawdown have been comprehensively addressed in Section 8.3 of the Draft EIS.

Some drawdown of groundwater levels is expected to occur around the process water bores at the site. Field investigations and groundwater modelling of the Andranangoo site has been conducted as part of the EIS study, and it is predicted that the groundwater drawdown will not cause salt water intrusion from the beach. The drawdown is expected to lower groundwater levels in an existing waterhole (near MM2) and an existing perennial spring (near MM2) by 0.1m, i.e. a minimal amount.

It is noted also that the impact to the groundwater flow regime is expected to be minor and temporary during the estimated three and a half years of mining activities at Andranangoo and six months at Lethbridge. It is expected these impacts will cease the following wet season after the completion of mining activity. At Lethbridge groundwater modelling is proposed, with impacts expected to also be minor and temporary during the short estimated mining period.

Monitoring of groundwater levels and quality prior to during and following mining activities will assess what groundwater drawdown is occurring and the impact on groundwater quality.

The potential impacts to flora from the change in flow regime have been described in Section 9.3 of the Draft EIS. Drawdown of groundwater from production bores are in areas of *Melaleuca* woodland, and this drawdown is not anticipated to have significant or long term impacts or mortality to the woodland. Buffer zones will be established between the mining areas and the damplands/wetlands of 50m and within 100m of mangroves. Mining will not occur in coastal vine thicket areas.

The ECNT state that at Lethbridge, the groundwater drawdown effect is predicted to extend 1.5 to 2km from the borefield (Fig. 8.9), and that within 50m of the production bores the drawdown is likely to be between 0.9 and 1.6 m. The ECNT have asked if there will be any significant impacts on the wetlands/damplands habitat at Lethbridge due to their close proximity (50m) to the borefield. Also, only preliminary groundwater modelling has been undertaken at the Lethbridge site, and potential impacts at Lethbridge are not discussed in detail in the Draft EIS.

Matilda commits to undertake more detailed modelling at Lethbridge to assess the impacts in more detail prior to mining, to determine the optimum location of the borefield (Section 8.5 Draft EIS). The optimum location of a borefield will consider the locations of wetlands/damplands and habitats of flora and fauna. This modelling work would be undertaken following the drilling program to be undertaken at the site.

The ECNT have asked if there is any saltwater intrusion into groundwater during storm surges or unusually high tides, and if this will be exacerbated as a result of the mining operations.

No seawater intrusion exists at Andranangoo and it would not be expected that mining activities would exacerbate seawater intrusion during storm surge. As discussed in this section above, the groundwater modelling predicts the limit of water table drawdown (less than 0.1 m) extends to the coast at the end of the dry season after three years of operation (Section 8.3.2 Draft EIS), i.e. a minimal amount.

Seawater intrusion already exists at Lethbridge, on the coastal plain. At Lethbridge further groundwater modelling is proposed, with impacts expected to also be minor and temporary during the short estimated mining period.

In general, the impact to the groundwater flow regime is expected to be minor and temporary during the estimated three and a half years of mining activities at Andranangoo and six months at Lethbridge. It is expected these impacts will cease the following wet season after the completion of mining activity.

7.1 Management strategies

MAGNT have stated that as freshwater swamps and springs, invertebrate fauna, seed banks, and litter faunal communities have not been addressed, it is impossible to 'develop and describe management strategies'.

Section 9.1.2 and 10.1.2 of the Draft EIS addresses impacts on mangrove and saltpan communities via groundwater use, surface disturbance and changes to surface water dynamics. Neither of these communities is expected to be impacted by the proposed mining works either through physical disturbance or through changes in surface water and groundwater dynamics. Similarly freshwater swamps and springs are unlikely to be affected by mining activities.

Management strategies to prevent impacts will include buffer zones, drainage management controls and groundwater monitoring. Environmental Management Plans for Flora have been presented in Section 25.1 of the Draft EIS and monitoring programs will be established.

Section 21 of the Draft EIS addresses rehabilitation. It is noted that topsoil will be stockpiled for progressive rehabilitation to preserve the soil seed bank. Stockpiling timeframes will be kept to a minimum. It is estimated that stockpiling will be limited to 2-3 months depending on weather conditions.

Fauna issues are discussed in the fauna chapter (Section 8 of this supplement).

7.2 Clearing

DPIFM believe that consideration should be given to the cost-benefit of clearing a small portion of vine thicket at Lethbridge for the extraction of the resource. Also, the rehabilitation strategies should recognise the different fire regimes that maintain vine thickets and the surrounding woodland. Replanted vine thicket would need to become sufficiently established and protected to prevent the opportunity for a 'fire penetration point' to impact on the natural vine thicket habitat.

In response to community feedback, Matilda has revised its mine management planning, and will not be mining in coastal vine thicket areas.

It is noted that fire is a natural part of the Tiwi landscape, however Matilda's presence in the areas will enable greater fire management. The Fire Management Plan will focus on protecting infrastructure, the mining areas and rehabilitation areas.

The ECNT have noted that approximately 110 ha of clearing for mining, roads and infrastructure, and consider that this is significant.

The area of clearing is considered minimal compared with the overall area of the Tiwi Islands. The overall areas to be cleared, for both the Andranangoo and Lethbridge sites, are:

- 65 ha will be cleared for mining;
- 44 ha will be cleared to upgrade existing roads; and
- 4 ha will be cleared for infrastructure.

It is noted that the total land area for the Tiwi Islands is 734,500 ha and the mining activities and associated works represent 0.015% of the total land mass.

It is also noted that the cleared mining area will be progressively rehabilitated as the works proceed, as such rehabilitation will occur quickly and clearing (except for the roads) will only be a temporary impact. As rehabilitation is to be undertaken progressively (within 2-3 months of mining), the area of disturbance will be lower than that presented above at any given time.

The TLC state that* Eucalyptus *open forest is the most widely represented habitat type on the Tiwi Island, and reserves in the NT within Cobourg National Park. The total extent of clearing this habitat type under the proposal is quite small. A significant proportion of the clearing (road access) comprises a narrow strip on either side of an already cleared linear alignment. Potential impacts on flora and fauna represented in this habitat are therefore unlikely to be significant.

Matilda thanks TLC for their positive comments.

7.3 Weed management

DPIFM have suggested that Matilda align their weed management plan with the Tiwi Islands Land Council 5 year weed management and control plan.

The EPA has asked for details of how haul road and mine access is planned to avoid areas of weed infestation around Pickertaramoor.

Matilda will develop its own Weed Management Plan, a framework of which is presented in Section 25.10 of the Draft EIS. This states that Matilda will adhere with the Tiwi Islands Weed Management Plan and quarantine requirements.

Matilda agrees that the Weed Management Plan should align with the Tiwi Island Land Council 5 year Weed Management and Control Plan. Further liaison is expected with TLC over the life of the operations to ensure this is conducted.

Matilda's draft Weed Management Plan states that Matilda will avoid areas of known weed infestation. For example the haul road to the port will not go via Pickertaramoor, but diverts to the east about 4-5 km north of Pickertaramoor, then runs east for 14km before proceeding north to Andranangoo. The minimum distance between the haul road and Pickertaramoor is 3km.

The EPA has asked for a description of the management procedures aimed at preventing the introduction of weed seeds into the mine site.

The EPA has asked for a description of the proposed weed control methods for the construction of the Lethbridge haul road

Section 25.10 of the Draft EIS describes the proposed Weed Management Plan. It is understood that strict quarantine measures are already in place to check all staff and equipment, particularly heavy earthmoving forestry equipment, prior to entering Tiwi Islands. This issue is considered significant by Matilda, and Matilda will ensure that quarantine procedures already in place will be strictly enforced.

NRETA have noted that the Draft EIS has identified weeds in the area of operation and haulage roads, and these issues have been addressed in Table 25.10 Pests, Weeds and Diseases EMP.

Matilda thanks NRETA for their positive comments.

The TLC has identified that the major threat to biodiversity conservation on the Tiwi Islands is the introduction of pest plants and animals. The TLC has strict quarantine procedures in place, and Matilda has agreed to comply with these.

Matilda thanks TLC for their positive comments.

7.4 Flora surveys

The EPA also recommends the examination of the sensitivity of vegetation immediately inland of the mine areas to smothering, as a result of sand dune destabilisation.

Matilda has implemented a number of management practices to reduce the risk of dune destabilisation:

- Mining will be undertaken in strips, with vegetation being retained between the mine strips;
- The use of buffer zones of 50 m to waterways, and wetland areas, and 100 m to mangrove areas surrounding the mine;
- A 200 m buffer zone will be maintained between the High Water Mark and the mining area;
- Mined areas will be progressively rehabilitated within 2-3 months of mining depending on weather conditions; and
- On going monitoring to assess erosion, stability and vegetation cover, and implementation of contingency plans as required.

These measures will reduce the risk of sand dune destabilisation.

The EPA asks if the end-of-wet season monitoring occurred, and if any more listed or endangered species are discovered, how their destruction will be avoided.

NRETA state that follow up surveys at Andranangoo apparently only covered the camp and infrastructure areas and not the mineralised areas. Similarly there was no follow up survey of the camp and infrastructure areas or the mineralised area at Lethbridge. ARS note that in response to the possibility that species of annual plants may have been missed, Matilda has undertaken to further monitor areas of proposed disturbance over time.

NRETA state that the Draft EIS does not indicate whether any further flora surveys have been conducted during the current wet season, nor does it provide any details of the proposed monitoring program.

MAGNT believe that the flora survey was adequate and more thorough and incisive than the faunal survey. It is noted that the follow-up late wet season survey called for by the consultant (page 9-1) because of the unusually dry wet season of 2004/05 was not undertaken. The number of plant species recorded (15.4% of the total Tiwi flora) is an indication that many of the wet season annual/ephemeral plants at the sites must have been missed (Vol. 1, page ES-15).

Of the significant species listed in the Guidelines, only three species are not likely to have been identified in the dry season surveys:

- *Calochilus caeruleus*
- *Typhonium jonesi*
- *Typhonium mirabile.*

Calochilus caeruleus occurs in open drainage flats within *Eucalyptus* woodlands, which is widely represented on the Tiwi Islands and not likely to be impacted by mining. *Typhonium jonesi* and *Typhonium mirabile* are both best recorded in December and January, and so they would have been observed in the January 2005 survey if they occurred within the area. These species occur predominantly in *Eucalyptus* woodlands which are widely represented on the Tiwi Islands. *Typhonium jonesi* is also known to occur in rainforest margins, however this habitat type will not be disturbed by the proposed operations.

These issues were subsequently discussed with the NT Herbarium, following the review of the submissions on the Draft EIS. The discussion covered the list of significant species identified in the Draft EIS Guidelines and other listed annual species that might be likely to occur within the habitats proposed to be disturbed by mining activities. These discussions indicated that further studies would be unlikely to provide any additional information.

7.5 Vegetation communities

The ECNT have stated that the EIS is unacceptably vague in its assessment of impacts upon each of the seven identified vegetation communities. The Centre believes that the potential impact of proposed operations on each of these vegetation communities requires further clarification and evaluation. The Centre also believes that mining should not be permitted in or near vine thicket, mangroves, wetlands or riparian areas.

In response to comments received on the Draft EIS, Matilda has made amendments to the proposal as set out in the Draft EIS. The revised buffer zones are as set out below:

- There will be no mining in damp plain or swamp areas and a buffer zone of 50 m will be maintained from rivers, creeks and wetland areas surrounding the mine;
- There will be no mining in mangrove areas and the buffer zone from mangrove areas will be increased from 50 m to 100 m;
- The sea turtle buffer zone of 200 m is retained;
- There will be no mining in coastal Vine Thicket vegetation areas; and
- There will be no mining in the drainage line from the escarpment spring in central Andranangoo Creek Project Area. It is noted that a 50 m buffer is not feasible in this area. Surface drainage management methodologies described in Section 7 of the Draft EIS will be implemented to minimise impacts in this area.

With the revision of the mining plans to prevent mining in the coastal vine thicket, only two vegetation communities will be affected by the proposed sand mining operations:

- the *Eucalyptus* woodland; and
- the *Melaleuca* woodland.

Both of these communities are well represented on the Tiwi Islands.

7.6 Rare, threatened or endangered flora

The ECNT refers to the Draft EIS Section 9.1.4, which it says states there have been inadequate surveys of rare and threatened flora species, and that Matilda will undertake further studies after mining commences. The ENCT believes that the results of such studies would be questionable, especially if critical habitats have already been destroyed.

In the Draft EIS Matilda committed to undertake further studies prior to the commencement of mining. Initially Matilda committed to undertake post wet season studies to identify whether or not any listed annual species occurred within the proposed area of disturbance. Subsequent discussions with the NT

Herbarium have indicated that these studies are unlikely to provide any additional information. However, pre-disturbance surveys will still be undertaken to advise rehabilitation programs

Matilda has revised its mining plans to prevent mining in the coastal vine thicket, which is known to have high conservation value.

No critical habitats are proposed to be disturbed by mining activities.

The EPA has asked if the listed threatened species (Cycas armstrongii) located at both sites could be recovered or transplanted successfully, and if this is planned.

Matilda confirms that they will attempt to recover and transplant *Cycas armstrongii* when encountered. This will be conducted in conjunction with appropriate assistance from specialists. Furthermore any findings and subsequent recovery and transplantation will be reported as part of Matildas MMP commitments.

8.1 Management strategies

MAGNT have stated that as freshwater swamps and springs, invertebrate fauna, seed banks, and litter faunal communities have not been addressed, it is impossible to 'develop and describe management strategies'.

Section 9.1.2 and 10.1.2 of the Draft EIS addresses impacts on mangrove and saltpan communities. Neither of these communities is expected to be impacted by the proposed mining works either through physical disturbance or through changes in surface water and groundwater dynamics. Similarly freshwater swamps and springs are unlikely to be affected by mining activities.

Management strategies to prevent impacts will include buffer zones, drainage management controls and groundwater monitoring. A draft Environmental Management Plan for Fauna has been presented in Section 25.2 of the Draft EIS, and monitoring programs will be established. Although there is no specific reference to invertebrate communities it is anticipated that the flora and fauna management programs will inherently limit potential impacts on invertebrate communities by minimising areas of disturbance.

Threatened invertebrate fauna that were listed in the Draft EIS Guidelines include *Amphidromus cognatus* (snail), *Trochomorpha melvillensis* (snail) and Dodd's azure butterfly (*Orygis iphis doddi*). As part of the preparation of the Draft EIS, Matilda assessed the likelihood of the proposed sand mining operations impacting these species.

It was noted that both the *Amphidromus cognatus* and *Trochomorpha melvillensis* are known to occur in coastal Vine Thicket. In response Matilda has committed to not undertaking mining in this habitat type.

Dodd's azure butterfly is a small butterfly of which little is known of its ecology. It is known to occur in dry Eucalypt woodland which is widely distributed within the region. Matilda's project will disturb 0.0084% of this habitat type on the Tiwi Islands, and is therefore not considered to pose a significant impact upon this species.

Flora issues are discussed in the flora chapter (Section 7 of this Supplement).

8.2 Road impact

The EPA would like procedures in the Fauna EMP to manage road injuries and deaths caused by haulage during night hours (dusk to dawn).

These issues will be included and an updated Fauna EMP is presented below: the additional comments are placed in bold for easy reference.

Table 3: Revised Fauna Management Program

Objectives and Targets	To minimise impact of proposed operations on local fauna, and to progressively rehabilitate mined areas as soon as practicably possible. To avoid disturbing area that have been found to contain species protected under the EPBC Act 1999 and TPWC Act 2000, CAMBA, JAMBA and the Bonn Convention where possible. To prevent the introduction and spread of feral animals. To progressively rehabilitate mining areas within one season of disturbance as per the requirements of the Mine Closure and Rehabilitation Plan. **To minimise fauna road injuries and death during road haulage activities**. **To rescue or relocate listed fauna that may be impacted by site activities.**
Actions	• Minimise areas of disturbance. • Identify areas that are not to be disturbed for conservation reasons and ensure that staff and contractors are aware of restrictions. • Survey areas identified as being inhabited by Butler's dunnart along Lethbridge haul road and investigate options for realigning the road to avoid disturbance. • Survey areas within mine sites that are found to be inhabited by masked owl and develop procedures to prevent and monitor impacts on this species. • Return old logs salvaged from cleared areas to rehabilitated areas to facilitate recolonisation of areas by local fauna (including birds). • Identify and target key fauna species for recolonisation of rehabilitate areas where appropriate. • Maintain a buffer zone of at least 50m adjacent to swamps, wetlands, mangroves, creeks and rivers to prevent any potentially negative impacts of mining upon these habitats. • Maintain a minimum buffer distance of 200 m from the beach areas to the mining areas to protect sea turtle nesting beaches. • **Train truck drivers in safe driving techniques and reporting requirements in the event of hitting fauna during transportation activities.** • **Staff to be trained in fauna identification and procedures for rescue and relocation.**
Monitoring	Fauna monitoring program. Masked owl monitoring program. Further survey of Butler's dunnart found to occur along the Lethbridge haul road. Feral monitoring will be included in fauna monitoring program (discussed in Pest, Weed and Disease Environmental Management Plan). **Record any incidents of fauna injury or death during transportation activities** **Record any incidents involving fauna rescue and relocation**.
Reporting	The results of Matilda's fauna management and monitoring program will be documented in Matilda's Annual Report of performance against the MMP.
Corrective Actions	The following constitute an incident or failure to comply: • Decline in fauna abundance and species diversity. • Disturbance to species protected under the EPBC Act 1999 and TPWC Act 2000, CAMBA, JAMBA and the Bonn Convention • Disturbance of habitats of known protected species. All incidents will be reported and managed through to resolution via Matilda's incident reporting procedures.

Relevant Legislation and Standards	Matilda's Environmental Policy Biological Control Act 1986 Mine Management Act 2001 Territory Parks and Wildlife Conservation Act 1999 Environmental Protection and Biodiversity Act 2000

The EPA have recommended the examination of the potential impacts upon turtle and bird nesting areas and populations from the creation of new vehicle access points into sensitive dune areas and beaches.

It is not proposed to construct any new vehicle tracks into sensitive dune areas and beaches. Personnel will be prohibited from accessing the beaches unless they are gathering data for the turtle monitoring program.

8.3 Rescue and relocation

The EPA would like the incorporation of an animal rescue and relocation measures into the Fauna EMP to operate in conjunction with any tree felling operations.

Animal rescue and relocation measures have been included in the revised Fauna EMP presented above, changes are shown in bold text.

There are a number of factors that affect whether relocated species survive in a new location. These include:

- unfamiliarity with the landscape (and hence knowing where resources such as food and rest sites are);
- stress; and
- competition with other individuals already present.

Therefore, knowing which species is present and in what numbers in the "new" area is required before undertaking such a task. Relocation is therefore a long-term and expensive process. Relocation will only be considered for species that are not considered to be "common" to the area.

8.4 Invasive species, feral fauna

The ECNT supports the strongest measures to prevent the introduction or spread of all exotic species and diseases.

Matilda concurs with this comment and has developed appropriate management plans to cover this issue. Strict quarantine procedures are already in place to check people and equipment, particularly forestry equipment, prior to entering the Tiwi Islands. Management to prevent feral fauna entering the Tiwi

Islands is discussed in Section 10.4 of the Draft EIS. This issue is considered significant by Matilda, and Matilda will ensure that quarantine procedures already in place will be strictly enforced.

The TLC has identified that the major threat to biodiversity conservation on the Tiwi Islands is the introduction of pest plants and animals. The TLC has strict quarantine procedures in place, and Matilda has agreed to comply with these.

The EPA have asked if there is a proposed management plan for feral dogs and buffalos, and have suggested that restrictions should be placed on bringing potential pests into the camp, such as cats and dogs.

Matilda concurs with these comments and has developed a draft Pest Weed and Disease Management Plan, which include the implementation of feral animal eradication programs. This is presented in Section 25.10 of the Draft EIS.

Management guidelines for feral buffalos can be developed and incorporated if necessary, however buffalo are a favoured food item of the TIWI people and are regularly hunted. Dogs/ Dingoes are already widespread on the Tiwi Islands, and feral cats are present in some areas. Dogs have been identified as a major threat to sea turtle eggs. Once operational, Matilda in consultation with the TLC, will look at opportunities to establish baiting programs to reduce the threat on sea turtles from feral dogs.

8.5 Fauna surveys

NRETA have noted that as the fauna surveys were carried out in the dry season, frogs may not have been adequately surveyed.

It is acknowledged that more frog species would have been surveyed if surveys were undertaken during the wet season.

However it is believed that all terrestrial vertebrate species of conservation significance likely to occur in the area could be detected during the dry season, and it is important to note that there are no species of frog of conservation significance known to occur on Melville Island.

MAGNT believe that the fauna survey is deficient as it was undertaken over a short period in the dry season; it was probably impacted by Cyclone Ingrid which had passed through recently; and very likely affected by the construction of the Andranangoo haul road which was under construction at the time of the survey. The bias of the survey was wholly vertebrate and it fails to describe freshwater and litter faunal communities.

The fauna survey was undertaken during the dry season but as mentioned above all terrestrial vertebrate species of conservation significance likely to occur in the area could be detected during the dry season, and would have been potentially observed if present. This is quite evident in the report, as 22 terrestrial vertebrate species of conservation significance and species listed under migratory agreements were recorded.

It is undeniable that some of the sites on both leases had been affected by Cyclone Ingrid. However there is nothing which can be done about this kind of extreme weather event. It could be just as reasonable to argue that any individuals that were remaining post-cyclone may be suffering from a lack of resources and so may enter traps more readily in order to feed.

Whatever the effect of the cyclone, many species, including species of conservation significance mentioned above, were still able to be recorded.

Disturbance by cyclones can also be seen as a relatively regular occurrence in Top-End environments, particularly for the Tiwi Islands. It could therefore be argued that the time since the last cyclone is a factor affecting all coastal environments of the Top-End.

The Andranangoo haul road survey was most probably affected by construction which was already underway when the survey was being carried out, however there is nothing which can be done about this post construction, except to mention this as a limitation, which was noted.

Surveys were not taken of freshwater communities, as the groundwater modelling indicated that it is unlikely that mining will impact these areas. Vegetation brush cover will be stockpiled and respread after mining. It is proposed to limit the stockpiling of vegetation to 2-3 months, depending on weather conditions.

MAGNT believe that the fauna section of the EIS is inadequate for several reasons:

- invertebrate fauna of swamps and springs can be highly localised and endemic and vulnerable to destruction (compare with mound spring faunas of SA that offer excellent parallels).

- the fauna survey was only undertaken in the Dry season.

- invertebrate fauna were not sampled.

- the possibility of locally rare or endemic vertebrates is not addressed.

- Amphidromus cognatus, Trochomorpha melvillensis, and the butterfly Ogyris iphis doddi, species that are specifically listed in the Guidelines, and are also listed as vulnerable under the TPWC Act 2000, were not surveyed.

Surveys were undertaken on both prospects from the 29 June to the 8 July 2005, on the Andranangoo haul road from 20 July to the 22 July 2005, and on the Lethbridge haul road from 22 August to 24 August 2005. All terrestrial vertebrate species of conservation significance likely to occur in the area could be detected during the dry season. Faunal studies of similar duration (albeit usually with a wet season component) for these types of project are conducted regularly throughout the N.T. and Australia.

The limitations of the Indicus report highlights the short duration of the study. However, nearly all of the terrestrial fauna of conservation significance for the island were recorded (see Table 10.1 of the Draft EIS for the list of fauna species of significance).

Only three terrestrial species of conservation significance were not recorded during these surveys (False Water-rat, Hooded Robin and Red Goshawk). The False Water-rat is known from only two sites on Melville Island, and the Hooded Robin from less than ten locations despite substantial survey effort for the Tiwi Islands. Therefore the survey results suggest that the survey effort was more than adequate.

An invertebrate survey, separate from these surveys, may have detected *Huonia melvillensis* or other species but the brief was restricted to vertebrate fauna only based on the targeted approach adopted by Matilda. There are references to the survey conducted by the museum in the report and it is appropriately cited in the reference list.

It is considered that the survey aptly covered the literature available on terrestrial vertebrates of the Tiwi Islands, including conducting an exhaustive review of the reports by Woinarski *et al*. (2000; 2003a; 2003b) which not only summarise the extensive surveys conducted by the Biodiversity Conservation Group of NRETA, but all other previous fauna records for the area.

It is agreed that invertebrate fauna of swamps and springs can be highly localised and endemic, however the comparison with the fauna of Great Artesian Basin (GAB) springs may not be a good parallel. The GAB springs of northern South Australia, which are the most researched of the GAB springs, are in very arid country, with general high year round temperatures, and isolated by considerable distances of desert country.

The MAGNT states that the Draft EIS relies on the statement that only 0.015% of the island's coastal vine thicket habitat of the snail species lies within the proposed mining area, and similarly that the* Eucalypt *woodland habitat of the NT endemic butterfly is widespread. The consultants responsible for the Fauna survey were formally provided with information on the land snails by the Curator of Molluscs at MAGNT, yet these snails (and others pointed out at the same time as occurring on the Tiwi islands like species of the genera* Xanthomelon *and* Parglogenia*) were apparently never surveyed during the course of faunal sampling. The failure to properly survey for these species is a significant omission.

It is recognised that MAGNT did provide Matilda's fauna consultants with information on listed snail species. In response to public comments Matilda has further revised its mine planning to prevent mining within the coastal vine thicket areas. This will reduce if not eliminate the likelihood of having a significant impact on snail species that are known to occur in this habitat community.

Dodd's azure butterfly is a small butterfly of which little in known of its ecology. It is known to occur in dry Eucalypt woodland which is widely distributed within the region. Mining will disturb 0.0084% of this habitat type and is not considered to pose a significant impact on these species.

MAGNT have noted that the fauna survey undertaken a decade ago by the museum was mentioned in the EIS only in passing, even though a new species of dragonfly,* Huonia melvillensis*, was described as a result of that survey.

It is noted that a new species of dragonfly, *Huonia melvillensis*, was described as a result of the survey referred to by MAGNT. In undertaking EIS assessment work, a judgement needs to be taken on the extent of baseline studies. In regard to fauna, this judgement is based on the listed species of significance, the presence of habitat of the listed species, and the area of disturbance of the habitat compared with the total area of habitat in the region.

Should the MAGNT wish to undertake survey work for *Huonia melvillensis*, or other invertebrate species in the area of the mining operations, Matilda would be pleased to offer short term accommodation at the camp, subject to availability, and also to agreement to undertake the appropriate site induction process and comply with site requirements for visitors. These conditions apply to all visitors to any mine site.

8.6 Habitats

MAGNT believe that the EIS has failed to 'identify and assess' the impact of the mining operation on freshwater swamps and springs, invertebrate fauna, and the seed bank in the top soil.

Matilda has adopted a targeted approach to the assessment of impacts on proposed areas of disturbance. The requirement or otherwise to assess freshwater ecosystems was to be based on the findings of the groundwater modelling for dewatering works. Given that the groundwater modelling did not indicate that these ecosystems would be impacted, assessment of them was not considered necessary.

The assessment of seed banks in the topsoil has not been conducted, which was agreed in consultation with the Parks and Wildlife Biodiversity Conservation Group. However once operational Matilda will commence working with the Tiwi Ranger Group to identify what seeds can be gathered for re-use in rehabilitation works.

As discussed in Section 14.3 of this Supplement, Matilda is committed to using seeds of local provenance. It is considered that given the short time duration of mining before rehabilitation that the re-spreading of top soil (2-3 months) will not compromise the viability of the seed population. Seeds used to grow seedlings in a plant nursery being established on Melville Island will be collected from either the areas to be mined or adjacent to the mining areas, to ensure local provenance is maintained.

MAGNT state that it is clear the areas to be mined are strongly affected by standing and flowing groundwater. It is noted that many of the plants listed as rare or threatened on the Tiwi islands (Vol. 2, Appendix C1, Table 3, after Woinarski et al. 2003) occur in swamps and swampy ground, like those of the genera* Cyperus, Eleocharis, Utricularia, Scleria, Crinum, Stylidium*, and* Xyris*. MAGNT believe that both the vertebrate and invertebrate fauna of permanent swamps and springs, seasonal wetlands, and vine thickets have not been addressed in the Draft EIS. This is despite the fact that invertebrates form a crucial part of the food chain in these habitats, are sensitive to environmental disturbance, and are good indicators for habitat restoration.

In response to the comments on the Draft EIS Matilda has revised the mining plans as follows:

- There will be no mining in damp plains and a buffer of 50 metres or more will be maintained from waterways and wetland areas;
- There will be no mining in mangrove areas and a buffer of 100 metres or more will be maintained from the mangroves;
- There will be no mining in the coastal vine thicket; and
- There will be no mining interrupting the drainage from the escarpment spring central to Andranangoo Creek project area. It is noted that a 50 m buffer is not feasible in this area. Surface drainage management methodologies described in Section 7 of the Draft EIS will be implemented to minimise impacts in this area

With the revision of the mining plans to prevent mining in the coastal Vine Thicket, only two vegetation communities will be affected by the proposed sand mining operations:

- the *Eucalyptus* woodland; and
- the *Melaleuca* woodland.

Both of these communities are well represented on the Tiwi Islands.

Matilda notes that there will be an impact on local invertebrate populations within the areas to be disturbed by mining. However it is not believed that these activities will have any significant impacts on any of the listed species contained in the Draft EIS Guidelines. Vegetation will be stockpiled prior to mining and respread after mining is completed. It is anticipated that stockpiling will be limited to 2-3 months, depending on weather conditions.

8.7 Sea turtles

NRETA have recommended that, in relation to Figure 11.1, maps should explicitly indicate where the proposed 200m turtle buffer intersects mineral zones, and explicitly indicate that no mining will take place within these intersections.

The EPA has asked if the 200m turtle buffer extends beyond the highest tide level.

As noted in Section 4.1, maps of the two proposed sites with more detail of the mine and camps areas, including topographical information, will be included in the MMP documentation to be submitted to DPIFM following the EIS approval process. These maps will depict the buffer zones.

The proposed 200 m turtle buffer zone extends from the Spring High Water Mark.

TLC notes the advice of Matilda's consultants that the location of the mineral deposits and proposed controls will mitigate impacts on sea turtles populations (Guinea 2005).

The TLC states that from research so far, the greatest threat to turtle hatchling success on the Tiwi Islands is predation of most by feral dogs. During field surveys for the Matilda project, all of the nests in both areas had been predated upon. Provision of base camp facilities will allow targeted baiting of nearby stretches of beach during critical nesting times, a strategy which has already proved successful in other areas on the Tiwi Island, and is recommended by NRETA.

The TLC's comments are noted.

The TLC in partnership with WWF Australia has recently completed a project for sea turtles conservation on the Tiwi Islands. This included gathering baseline data, which was hampered by minimal on-ground resources and the remoteness of most Tiwi Island beaches. Advice from WWF Australia is that it would take many years to determine the relative significance of nesting beaches on the Tiwi Islands. The locations of the current proposal are along two remote beaches, and Matilda has committed to carrying out surveys of nesting activity for the period of operations. This information will be passed on to the TLC to be included in broader long-term studies including assessments of significance of the entire region.

Matilda is committed to protecting sea turtle nesting sites and will assist in gathering information for use by TLC.

9.1 Biting insect surveys

DHCS noted that biting insect trapping had been conducted in November, with the results of the survey revealing low levels of biting midges, indicating biting midges are not expected to cause anything more than a minor nuisance problem at both mining prospects.

The comment by DHCS is noted.

MAGNT believe that the biting insects survey was inadequate because:

- ***It was only undertaken in the Dry season.***

- ***There is no indication that any existing swamp or spring was surveyed in daylight.***

- ***The brief survey undertaken (one night at each site, neither corresponding with a full moon) detected four species of mosquito that "will pose a high risk" for disease. Additional species of mosquito, which may act as vectors for disease, may be identified during wet season surveys.***

The Biting Insect surveys were undertaken by the NT DHCS. The surveys were undertaken in accordance with DHCS methodology. The study completed by DHCS was part of a four-stage approach. Additional analysis was conducted in the peak trapping season one day before full moon in November 2005 and January 2006.

A further event is also scheduled for May 2006. The results of the trapping are to be reported after the May event and will be included in the MMP.

The November trapping was designed to sample peak season biting midge numbers, the January event was for peak mid wet season mosquito abundance and diversity, and the May event is for peak post-Wet Season mosquito abundance and diversity.

9.2 Risks from different species

***DHCS has noted that* Verrallina funerea *will only cause a potential, not considerable risk for Ross River Virus (RRV) and Barmah Forest Virus (BFV) transmission, as this species is not known to be a major vector of arboviruses compared to* Ochlerotatus vigilax *and* Culex annulirostris.**

DHCS note that adult mosquito trapping in November 2005 revealed a low risk of malaria transmission at both mining prospects, and adult mosquito trapping in January 2006 revealed a moderate risk of malaria transmission at the Andranangoo Creek West mining prospect, and a low risk at the Lethbridge Bay West prospect. This supports the statement by Warchot and Whelan (2005) that a potential risk for malaria transmission is likely to occur for extended periods of the year at both mining prospects. The DCHS conclude that the mosquito trap results reveal that there is likely to be a potential malaria transmission risk for most months of the year at both mining prospects.

DPIFM have noted that the mosquito* Aedes aegypti *have been recorded in the Tiwi Islands, albeit rarely, and that it may be worth noting this mosquito when considering potential sources and impacts from biting insects.

These comments by DHCS are noted.

9.3 Control measures

DPIFM suggest that the proposed use of active control measures for biting insects should be adequately explored. Options related to relocation of facilities, improved personnel management and other aspects should be considered prior to chemical controls.

Section 18.5 of the Draft EIS states the camp facilities will be located in the upland eucalypt vegetation away from the mangrove creeks. In addition, the framework of an Environmental Management Plan for Biting Insects was presented as Section 25.12.

It is agreed that alternative options will be explored before resorting to chemical methods of control.

10.1 Community complaints process

DHCS would like to know how the community may lodge complaints about dust emissions and noise, and how Matilda would monitor and assess complaints.

Matilda will develop a complaints procedure prior to mining commencing; this is likely to comprise the following:

- Record complaint and discuss with parties concerned;
- Investigate complaint and approve corrective actions required;
- Provide feedback to complainant; and
- Confirm successful implementation of corrective actions.

All complaints received would be recorded in a complaints register, together with the actions taken to respond to the issue. Any complaints would be presented in the annual MMP prepared by Matilda.

10.2 Occupational silica exposure

The EPA note that even though <1% of the concentrate sands will be of size <10 µm, this still may represent a large amount of potentially airborne particles being handled and stockpiled each day, particularly for the freshly dug and stockpiled material, since at this stage in the process fine sand appears more likely to be/become dry and airborne prior to being slurried. The EPA have asked for description of the expected level of risk to mine personnel to inhalation of inhalable silica dust from windblown sand particles, and management measures to be incorporated to prevent such exposure. The EPA stated that cabins on the loaders would also help protect the morning and night-shift drivers from the mosquitoes and biting midges.

Occupational silica exposures are expected to be low, owing to the general coarse nature of beach sand, and its moisture content. It is recognised that when the sand dries, the potential for silica to become airborne increases; thus watering would be used during dry windy weather to minimise dust generation. It is also noted that the personnel with key potential for dust exposure are the front-end-loader operators; in this respect the cabs of the front-end-loaders would be air conditioned, which would minimise potential silica exposure.

As part of the occupational health and safety program, Matilda would undertake periodic assessment of silica exposure for personnel at most potential risk, by use of personal samplers. The regulation of occupational dust exposure levels is the responsibility of DPIFM; the personal sampler monitoring program would be in accordance with the requirements of DPIFM.

10.3 Greenhouse gas emissions

The EPA has recommended the inclusion of actions Matilda will undertake to minimise greenhouse gas emissions. The Agency has also recommended that these actions be included in the Mining Management Plan, and for Matilda to join the Commonwealth Government's Greenhouse Challenge Plus Program.

The EPA has also advised that the NTG has committed to the mandatory public reporting of greenhouse gas emissions by major industry. Implementation of this commitment is being investigated, and it may be that Matilda will be captured by this commitment in the future.

Matilda has made the following commitments to minimise greenhouse emissions:

- Matilda commits to decreasing greenhouse gas emissions through the efficient use of resources (Section 12.2 of the Draft EIS).
- Matilda commits to minimising the area of land cleared at any one point in time to reduce the amount of CO_2 released to the atmosphere (Section 12.2 of the Draft EIS).

Matilda will include an assessment of Greenhouse Gas emissions as part of its MMP annual reporting.

Matilda will consider joining the Commonwealth's Greenhouse Challenge Plus Program, however it is noted that the program is of limited benefit in driving greenhouse benefits for projects that are already greenhouse efficient. Matilda, along with the mining industry generally, awaits the implementation of coordinated National Pollutant Inventory and Greenhouse reporting.

The EPA have recommended that the Fire Management Plan is developed in consultation with the Bushfires Council, and that this plan be developed with an objective to minimise greenhouse gas emissions through strategic early dry season controlled burning.

Matilda agrees and will develop the Fire Management Plan in consultation with the Bushfires Council.

11.1 Radiation dose and exposure

DHCS state that the Executive Summary implies that the radiation dose to members of the public could exceed 1 mSv per year above background. The dose to the critical group could be 0.5 mSv. Therefore, the radiation dose limit for members of the public could be exceeded through this operation. Exemptions as described on page 20 of the current Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Milling Processing, clause 3.5.1, third paragraph suggest that this operation would not automatically be exempt. However, in the longer term, it could be shown that it might be inherently safe and Matilda could re-seek exemption.

Matilda apologises for any implication that the radiation dose to the members of the public could exceed 1 mSv per year. As indicated in Section 14.1 of the Draft EIS the background dose is estimated to be 0.53 mSv per year. An upper confidence limit of 1.4 mSv per year was placed on this, however it is noted that this value is background, and is not as a result of mining operations.

As noted in the Draft EIS, by way of comparison typical backgrounds in Adelaide vary from 0.80 to 1.3 mSv per year, and the typical backgrounds in Darwin based on measurements taken on 14 October 2005 range from 0.50 to 1.0 mSv per year. The background levels as measured at the mine sites are thus generally low compared with Adelaide and Darwin.

DHCS suggests that radon decay product monitoring is not necessary, as radon decay products are unlikely to contribute to the effective radiation dose. However, modelling for the pathways for external gamma exposure and for long-lived radionuclides in inhalable dust, both of which may contribute sufficiently to radiation dose, were not included in the Draft EIS and should be included in the monitoring program.

It is acknowledge that radon decay monitoring is not necessary. It is further acknowledged that the monitoring program will measure external gamma exposure and for long lived radionuclides in inhalable dust once operations commence. The proposed monitoring plan is set out in the Radiation Management Plan, which is presented in Appendix D of this supplement).

DHCS comments that the radiation risk factors from the different radiation exposure pathways may not be understood.

The potential exposure pathways are well understood, however, no data to support potential exposure pathways is able to be collected until such time as the site commences operation. Monitoring to determine the different exposure pathways will be included in the Radiation Management Plan.

However the baseline monitoring demonstrates that the background radiation levels are low; the uranium and thorium content of the mineral sands is low; and the expected radiation dose of mining personnel is low.

The ECNT is very concerned about possible radiation contamination of the environment and radiation impacts on workers. The ECNT believes that notwithstanding Matilda's claim that radiation levels from the mine are low and expected worker exposure levels are acceptable, this matter needs careful independent consideration prior to any approval being given.

Matilda acknowledges the ECNT comment, and re-affirms the conclusions of the Draft EIS. In summary, these conclusions are that the background levels are low, the uranium and thorium content of the mineral sands is low, and the expected radiation exposure of mining personnel is low. Further monitoring will be undertaken as part of the Radiation Management Plan.

11.2 Radiation licensing requirements

DHCS state that Paragraph 4 of ES-23 (need to apply for a licence to possess, sell and handle radioactive material and appoint a Radiation Safety Officer) is correct.

DHCS state that the 1987 code (Code of Practice on Radiation Protection in the Mining and Milling of Radioactive Ores) does not apply to mines based on assay results but does apply based on radiation dose. The assay results do not show, without other evidence, that radiation dose would be less than 1 mSv above background. However, the assay results would imply that the separated mineral would be defined as radioactive under the Radiation (Safety Control) Act and the new Radiation Protection Act. If it can be shown that no significant radiation dose is received, Matilda can re-apply for exemption.

DHCS has informed Matilda that based on the application seeking exemption from the Radiation (Safety Control) Act, the operation is not exempt, and will not be exempted at this time, and the Code of Practice for the Safe Transport of Radioactive Material (2001) does not apply for the operation.

A licence will be required under the Radiation (Safety Control) Act, and a Radiation Safety Officer will need to be appointed. A condition of the licence will be that the operation is in accordance with the Code of Practice for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing (2005). A Radiation Management Plan is required for the operation.

NT Worksafe can provide information on the Radioactive Ores and Concentrates (Packaging and Transport) Act.

Matilda notes the DCHS comments.

Matilda has applied for a licence under the Radiation (Safety Control) Act, which is expected shortly. In addition, a Radiation Officer will be appointed for the works.

The Radiation Management Plan is presented in Appendix D of this Supplement.

12.1 Employment strategies and training

DHCS Tiwi Health Services is interested in Matilda's local employment strategy.

Matilda is committed to creating local employment opportunities during the construction, commissioning and operational phases of the Project. The company has commenced dialogue with the Tiwi Islands Employment and Training Board (TIETB), and any training requirements Matilda needs will be met through TIETB.

Matilda will continue to work with the TLC and the community to assess demand for employment and desired working conditions. Matilda's local employment strategy will be made available to DHCS Tiwi Health Services when it is complete.

The EPA has asked if the skills gained by the local community that are employed by Matilda are going to be accredited qualifications for use after mine closure.

Matilda will continue to work with the TLC and the community to assess demand for employment opportunities and desired working conditions. TIETB have been engaged to provide training needs and coordinate any accredited training programs. The skills gained by local employees will be valuable when seeking other further employment opportunities on the Tiwi Islands following mine closure.

12.2 Ranger program

The TLC state that should the project be successful, Matilda has committed to support the development of a Tiwi ranger programme. Such a programme will increase the overall capacity for biodiversity management throughout the region. Matilda has also offered the use of their base camps and local operational support for any survey or research work undertaken. This is significant because the proposed sites are in remote areas.

The TLC considers that, given the commitments Matilda has made to a Tiwi Ranger programme, the improved access and provision of base facilities in remote areas, and the small and short term foot print of the development, the project will add to the capacity for natural resource management on the Tiwi Islands. The TLC trusts that the EPA will take these matters into account during its assessment of the Draft EIS.

Matilda thanks the TLC for their positive comments.

12.3 Local Community Support

The TLC have discussed the Matilda Draft EIS and was assured that the documents were on public display at the Land Council Office and at Milikapiti, and that members and landowners had advice of the Draft EIS and their entitlement to read it and comment upon it. A summary of the Draft EIS was discussed at landowner group meetings through February, and a number of Tiwi Landowners have

already been involved in collection of data for the study and have contributed information related to impacts and risks to the marine environment and to sites of significance. None are perceived or considered a risk.

The TLC note that at none of the TLC meetings has there been any adverse comment, information or consideration suggesting anything but a minor manageable impact upon land and coastal areas owned by the Tiwi people. Management Meeting 143 attended by six important landowners complimented Matilda on the thoroughness of the Draft EIS and requested TLC Environment Officer Kate Hadden to respond in these terms. The Meeting also noted the continuing close consultation between Matilda, affected landowners and the TLC over a period of several years and resolved to write to Minister Scrymgour expressing disappointment with perceptions of her support and encouragement of the Matilda project, the Marine Harvest Project and of significant forestry on the Islands.

The TLC note that representatives of Matilda first met with the Council in 2003. Numerous subsequent discussions were held with TLC members and Traditional Owners, who approved the proposal for exploration and, subsequently, mining of the above areas. Agreements between Matilda and the Tiwi Land Council have since been negotiated to the satisfaction of Traditional Owners.

The TLC state that the Tiwi Vision for the future is of an independent and resilient society built on the orderly and well managed utilisation of natural resources. A key objective of the Tiwi Islands Natural Resource Management Strategy 2004 is to develop a range of resource development options that are consistent with other natural resource management objectives. The TLC and Traditional Owners support considered and careful planning to ensure that economic developments do not deny the rights of future generations to enjoy the cultural and natural resource values of their land. Traditional Owners strongly support this development, as it fits within their overall vision for the Tiwi Islands.

In response to the above comments, Matilda is committed to continue working closely with the TLC to support the Tiwi Vision for the future.

12.4 Benefits

The ECNT propose careful monitoring to ensure that the claimed economic benefits to the Tiwi Island community are real and delivered.

The TLC note that Traditional Owners anticipate a range of benefits from the proposal including:

1. Income stream from land rental and other payments;

2. Upgrades of existing roads, providing improved access to traditional country;

3. Provision of water bores in country customarily used by Tiwi people;

4. Provision of other permanent infrastructure, such as sheds that can be used either by Traditional Owners, as future tourist facilities or long term bases for studies and research;

5. Significant additional business for the Tiwi owned international port, Port Melville, with flow on outcomes for employment and training;

6. Direct employment and training (some of which has already been carried out during the exploration phase);

7. Opportunities for developing commercial contract services such as seed collecting, nursery establishment and operation, and rehabilitation;

8. Support towards larger scale natural resource management programs on the Tiwi Islands.

Matilda will continue to work closely with the TLC to ensure the economic benefits to the Tiwi Islands community are real and delivered.

The EPA have asked for discussion regarding leaving infrastructure for future use by the local community, along with the increased requirements for schooling and health care in a newly established population centre.

No new populated areas will be created nor established, and so it is not expected that there will be any requirement for additional schooling and health care.

Matilda has committed to upgrading roads and other facilities to help and support the local community, and has consulted to ensure that any infrastructure to be left following Matilda's departure will be beneficial to the Tiwi community. Any remaining infrastructure left in agreement with the TLC will be owned and managed by the TLC, and they will determine its ongoing use.

The TLC notes that no communities are near the proposed project areas, so there will not be any impacts on community residents.

The TLC's comment is noted.

The EPA have asked how the potential benefits and impacts of increasing access to remote areas of the island in which the mining activities will occur will be managed in a culturally appropriate manner.

Improved access is an important benefit to the Tiwi Islanders and is considered by the TLC to be a positive impact. Matilda will continue to work closely with the TLC to ensure a common understanding is reached on the benefits and impacts of increased access to other parts of the Island, and that it is managed appropriately.

12.5 Conflict resolution

The EPA would like Matilda to outline the measures to manage any conflict that may arise between the Traditional Owners and the proponent, including the possibility of halting operations mid-way through mining operations.

Measures to manage any conflict that may arise between the Traditional Owners and Matilda will be determined in consultation with TLC.

12.6 Revenue

The EPA has asked why the Government Revenue has been calculated as post profit, rather than a percentage of gross.

There is no legislative requirement that can be used as a basis to calculate royalties for negotiated Mining Agreements in the NT.

The NTG royalty is based on a project profit, including depreciation and amortisation of equipment and exploration costs. A portion of the NTG royalty is re-distributed to the TLC, who will re-distribute a portion back to the affected landowners under the Aboriginal Land Rights Act (1976) schedule.

Matilda has determined that the NTG royalty-profit based calculation may be an inequitable calculation for different landowners in the same project, in particular during early production periods, where there may be a higher rate of amortisation and depreciation based on low reserves. Thus, under this system, landowners for the early production periods could receive a dis-proportionally low royalty compared with landowners in later stages of the project; this would be inequitable.

The gross realisation royalty, which has been included in the Mining Agreement, allows for production to be attributed to specific areas and distributed to affected landowners without adjustments for costs. This approach is much more equitable to individual landowners.

12.7 Police funding

The EPA have asked what interaction has been undertaken with the NT Police regarding their capacity to staff the proposed police station to be built by the Tiwi Land Council, and associated costs.

The decision on the construction and use of a proposed police station lies with the TLC and the NTG. Matilda is not a part of any such dialogue.

13.1 Management plans and procedures

HCS considers that Matilda has adequately complied with all recommendations previously made by HCS in the original NOI and the Draft EIS.

HCS notes that Matilda has included the results of the January 2005 archaeological and heritage/historical surveys in the Draft EIS.

HCS notes that Matilda has acknowledged the correct procedure for applying for permission from the Minister to disturb the one site of local archaeological significance.

HCS notes that Matilda have acknowledged that a Cultural and Heritage Management Plan should be prepared to manage any Aboriginal or archaeological and ethnographic sites that may be identified in future works. The Management Plan will include a response mechanism to mitigate the loss of any subsurface archaeological material that may be located during mining operations.

HCS considers that there are no further heritage issues associated with Matilda's Draft EIS for the Mineral Sands Mining Project on Melville Island.

The HCS comments are noted.

HCS notes that Matilda plans to advise all employees and contractors on the existence of Aboriginal archaeological and ethnographic sites that may be discovered, and that they should be avoided.

The HCS comment is noted.

As noted in Section 3.2 of this Supplement, a burial site is known to occur in the vicinity of the mine; however, a site visit could not locate it and indicated it was unlikely to be within the area proposed for disturbance. Extensive consultation has been conducted with the Traditional Owners with regard to this issue. If evidence of a burial site is discovered during operations, operations will cease immediately and the TLC will be notified as soon as possible. This procedure is discussed in Section 20.1.2 of the Draft EIS.

The MMP will deal with issues related to the discovery of previously unknown artefacts.

14.1 Biting insects

DHCS has noted that Matilda should commit to ensuring that disturbed areas are appropriately recontoured or drained to prevent water ponding and mosquito breeding.

Matilda confirm that the proposed rehabilitation works will be completed in such a manner as to prevent water ponding either by recontouring of the final landform or by use of drainage to prevent water ponding and mosquito breeding (or a combination of both).

Backfilling, recontouring and rehabilitation will be undertaken on an ongoing basis, closely following the mining face (Section 2.2 of the Draft EIS). The time interval between mining and commencement of rehabilitation will be 2-3 months.

As the mineral sands are within dunes some 3-5 m high, and the level of the dunes will reduce by about 0.15 m following mining, it is most unlikely that any ponding will occur on rehabilitated areas. If ponding were to be observed, rectification works would be undertaken.

14.2 Impact of weeds

MAGNT state that in similar sites that have been mined for sands around Darwin (most conspicuously Casuarina Coastal Reserve), stochastic events, motile sand, plus the appearance of opportunistic weedy grasses (Buffel Grass, Mission Grass), **Sida spp., Lantana camera, Passiflora foetida, Calopogium muncoides, Crotalaria goreenensis** ***and*** **Hyptis suaveolens,** ***(all of which are present on Melville Island) unless controlled will ensure the original vegetation never returns, particularly the*** **Melaleuca** ***woodland. Some of the existing plants are notoriously hard to re-establish from seeds and/or seedlings without enormous attention (e.g.,*** **Pouteria sericea, Syzygium suborbiculare*****). MAGNT note also that the generic name is misspelt*** **"Sysygium"** ***throughout the section on Flora.***

Matilda is committed to returning the landscape to an appropriately vegetated form. The introduction of weeds will be closely monitored and weed eradication programs will be implemented if and as required.

Weed management will be included in the Pest, Weeds and Diseases Environmental Management Plan, a framework of which is presented in Section 25.10 in the Draft EIS. As part of this plan Matilda is committed to working closely with appropriate authorities such as NRETA and the Tiwi Barge Service.

The misspelling of *Syzygium* is noted, and this is included in the Errata (Appendix B).

14.3 Rehabilitation success

The EPA have requested evidence that the revegetation effort is likely to be able to successfully restore ecosystems to a state similar to the original condition.

In order to develop rehabilitation strategies URS reviewed a benchmarking study of sand mining rehabilitation metodologies. The sites assessed included:

- North Stradbroke Island Mine.
- Namakwa Sand Mine.
- Rehabilitation sites in the Gascoyne.
- Coburn Mineral Sand Mine.
- Rehabilitated fire buffers in Peron Peninsular.
- Rehabilitation sites along the Dampier to Bunbury pipeline.

URS also reviewed the application of Landscape Function Analysis (LFA) methodologies to measure rehabilitation success (Tongway and Hindley 2004). In a study undertaken by Tongway and Hindley (1997) of a sand mine in Queensland, the following key issues were identified as the key factors for rehabilitation success:

- Collection of vegetation litter prior to mining. The litter provides valuable ecosystems for both fauna and flora as well as providing nutrient resources.
- Development of an affective nursery on-site to establish seedlings prior to re-planting.

Matilda is committed to ensuring both of these issues are appropriately managed. Vegetation and topsoil will be stockpiled prior to mining and re-spread on rehabilitated areas when mining is complete. The time interval between mining and commencement of rehabilitation will be 2-3 months, thus much of the seed bank in the re-spread vegetation will still be viable. A nursery is being established on Melville Island, and TLC Rangers will be contracted to provide rehabilitation services.

The EPA has asked how long the revegetation effort will be maintained.

The EPA have asked what support systems are in place to assist the local community who will be subcontracted to undertake the rehabilitation operation, such as expertise and resources, to ensure quality control.

The Draft EIS sets out completion criteria for mine closure (Table 21.1 of the Draft EIS). The revegetation effort will be maintained until the agreed completion criteria are met. At this time Matilda has committed that resources would be available for up to five years post mine closure to assist with the rehabilitation works.

This commitment is expected to be sufficient to rectify any physical issues associated with the rehabilitation works post mining. Matilda will work with the TLC Ranger program to provide adequate training to ensure the ongoing monitoring of disturbed areas continues until completion criteria are met.

Matilda has committed to supporting the TLC Ranger program as well as training locals in rehabilitation care. If required, Matilda will provide specialist expertise to assist the TLC Rangers to address specific issues.

The EPA have recommended the examination of measures for keeping vehicles off revegetated areas, fragile dunes and beaches in the lease area after mine closure.

Matilda confirms that their vehicles will not be permitted to drive on revegetated areas, fragile dunes or beaches in the lease area after mine closure. Matilda will also put in place measures to discourage vehicle access beyond the camp area, such as logs or other barriers.

MAGNT believe that the plans for land clearance and revegetation (ES-4) are inadequate because:

- The native hardwood timber could be salvaged to augment existing timber and woodchip industry on Melville Island, and value-add to the Melville economy;

The majority of the clearing will be conducted in areas of *Melaleuca*, which is not considered economically viable for commercial timber milling or wood chipping.

- Decaying vegetation, especially Melaleuca and Eucalyptus logs, when respread, are prone to hot-burn fires which will remove any regrowth.

It is understood that it is acceptable NTG practice in parks to re-use such logs as they provide important habitats and niches for the re-establishment of fauna and flora. It is noted that fire is considered part of the natural life cycle and is regarded as important for vegetation regrowth and survival.

- Many of the plants included in the faunal survey have short periods of viability in the soil (especially Casuarina equisetifolia), and so will be non-viable when the top soil is respread.

It is considered that given the short time duration of mining before rehabilitation that the re-spreading of top soil (2-3 months) will not compromise the viability of the seed population. If problems are encountered in germination of specific species such as *Casuarina equisetifolia* Matilda will supplement seed and plant seedlings to promote establishment of these species. In addition, Matilda will be assisting in the establishment of a nursery in consultation with TLC.

- Insufficient details are provided for plans to harvest, maintain, grow-out, and respread the seeds from existing vegetation.

Matilda is committed to successfully rehabilitating the site and will assist in training of TLC Rangers to harvest seeds and grow seedlings in a plant nursery being established on Melville Island. Specialist expertise to address specific issues will be provided if required to support the TLC Ranger program.

- Catastrophic, stochastic events like cyclones, floods, storm surges, tsunamis and fires, could destroy any regrowth.

It is acknowledged that should such events occur that Matilda will assist in further rehabilitation works. Should any damage to the mining area or to recently rehabilitated area occur during a cyclone, storm surge or other event, Matilda would undertake the necessary rehabilitation works in these areas in accordance with the approved Rehabilitation and Mine Closure Plan, described in Section 21 of the Draft EIS.

MAGNT have stated that the Draft EIS gives no support to the claim that the stockpiling and respreading of topsoil and brush cover will facilitate the revegetation of mined sands with the original species composition.

As noted above, Matilda is committed to using seeds of local provenance and will use LFA as the mechanism for measure the progression of rehabilitation works Tongway and Hindley (2004). It is considered that given the short time duration of mining before rehabilitation that the re-spreading of top soil (2-3 months) will not compromise the viability of the seed population. Seeds used to grow seedlings in a plant nursery being established on Melville Island will be collected from either the areas to be mined or adjacent to the mining areas, to ensure local provenance is maintained.

Studies in the application of LFA to sand mining have indicated that collection of seed litter is a key factor in rehabilitation success (Tongway and Hindley 1997).

14.4 Post mine closure

The EPA has asked about the extent of non-revegetated, cleared land that will remain at the camp sites after the mine closes.

The area of cleared camps at each site is to be 2 ha. Discussion will be held with TLC at the time of mine closure to assess if this land is to remain cleared for use by TLC or is to be rehabilitated. It is noted that the haul roads will continue to be used for access by Tiwi Islanders following Matilda's departure and will not be rehabilitated.

The EPA has asked how the roads and bores will be maintained after mine closure, and who will cover the financial responsibility of such maintenance.

The responsibility for maintenance of any roads and bores remaining after mine closure will be outlined in the Mining Agreement between Matilda and the Tiwi Land Council.

14.5 Exploration rehabilitation

DPIFM state that the use of octo-plugs is not recommended as per the Minerals and Energy advisory note "Capping and Plugging of Drill Holes". The use of plugs in general in a sand environment is not 'best practice' and other options should be explored for rehabilitation of drill holes.

Other options for rehabilitating drill holes include backfilling with cuttings (with or without the use of a bentonite plug). It is noted that the boreholes in sandy soil tend to collapse when the drill rods are removed and therefore will essentially be filled with cuttings.

It is noted that the suggested use of octo-plugs in the Draft EIS for capping and plugging bore holes was included in error; it is used by Matilda at other exploration sites, and is referenced in their Exploration Management Plan, but the use of octo-plugs is not appropriate in sandy environments.

14.6 Security and closure

The ECNT recommend that a substantial cash rehabilitation bond be held by the Northern Territory Government.

The EPA has stated that a Draft Rehabilitation and Mine Closure Plan and an indication of the level of the security to be lodged should be submitted as part of the assessment process, and have stated that the bond should be sufficient to cover failure of the initial rehabilitation and time blowouts.

Section 21.6.2 of the Draft EIS outlines the process by which an agreed Security amount will be calculated; this will be included in the MMP and submitted to DPIFM for approval.

The ECNT have stated that Matilda should remain legally and financially responsible for mine site rehabilitation for several years after any given mine has closed.

Matilda is committed to rehabilitating the mined areas in accordance with the Rehabilitation and Mine Closure Plan, described in Section 21 of the Draft EIS. The Plan will set criteria to be met prior to Matilda relinquishing their ownership of the site.

Tongway, D.J., Hindley, N.L. (1997) Indicators of Ecosystem Rehabilitation Success and Selection of Demonstration Sites – Task 3.9 EFA Survey of CRL's North Stradbroke Minesite.

Tongway, D.J., Hindley, N.L. (2004) Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes with Special Reference to Minesites and Rangelands.

URS (2006). Andranangoo Creek West and Lethbridge Bay West Mineral Sands Mining Project. Draft Environmental Impact Statement. Prepared for Matilda Minerals Ltd, February 2006.

Woinarski, J. C. Z., Brennan, K., Hempel, C., Firth R., and Watt, F. (2000). Biodiversity Conservation On The Tiwi Islands: plants, vegetation types and terrestrial vertebrates on Melville Island. A report to the Tiwi Land Council. Parks And Wildlife Commission of the Northern Territory.

Woinarski, J. C. Z., Brennan, K., Cowie, I., Kerrigan, R. and Hempel, C. (2003a) Biodiversity Conservation on the Tiwi Islands, Northern Territory Part 1 Environments and Plants. A report to the Tiwi Land Council. Parks and Wildlife Commission of the Northern Territory.

Woinarski, J. C. Z., Brennan, K., Hempel, C., Armstrong, M., Milne, D. and Chatto, R. (2003b) Biodiversity Conservation on the Tiwi Islands, Northern Territory Part 2 Fauna. A report to the Tiwi Land Council. Parks and Wildlife Commission of the Northern Territory.

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of Matilda Minerals and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 8 March 2006.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between 10 March 2006 and 13 April 2006 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

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Summaries of Responses and Index

Appendix B
Draft EIS Errata

Appendix C
Hydrocarbon Management Guidelines

Appendix D
Radiation Management Plan