



KOOLANOOKA – BLUE HILLS DIRECT SHIPPING ORE (DSO) MINING PROJECT SCOPING DOCUMENT

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MIDWEST CORPORATION LIMITED

**KOOLANOOKA/BLUE HILLS REMNANT
DIRECT SHIPPING IRON ORE (DSO) MINING
PROJECT**

**ENVIRONMENTAL SCOPING
DOCUMENT**

EPA Assessment No. 1653



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***ecologia* Environment**

1025 Wellington Street
WEST PERTH WA 6005

Phone: 08 9322 1944

Fax: 08 9322 1599

Email: garry.connell@ecologia.com.au

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Executive Summary

This scoping document has been developed for the Midwest Corporation in order to fulfil submission requirements of the Western Australian environmental approvals process, concerning the proposed Koolanooka / Blue Hills Remnant Direct Shipping Iron Ore (DSO) Mining Project. This project addresses the revival of two pre-existing iron ore mines at Koolanooka and the Blue Hills area. Once ore has been extracted from these locations and processed, ore will be transported by truck and rail to the nearby port at Geraldton for export.

The implementation of the proposed development is dependent on successful resolution of any associated issues, through effective application and assessment of environmental approval processes. Baseline surveys and investigations for environmental aspects of the project are currently being conducted, with management plans for significant aspects of the project to be developed in compliance with regulatory guidelines. Ongoing consultation with regulators, relevant stakeholders and interested members of the public is also being undertaken to incorporate community concerns as part of the assessment process.

The works proposed with this project will be largely conducted within pre-existing pits and previously disturbed areas. The DSO Mining Project has been designed to minimise environmental impacts and as such all haul roads, waste dumps, ore stockpiles and infrastructure will be located on previously disturbed land that will require minimal clearance activity.

Potential impacts in implementing the DSO include disturbance to flora and fauna, the evolution of dust and gases, reduction in visual amenity and social factors, noise and vibration issues, waste material control, and influence to surface and ground water bodies. This Scoping Document discusses these issues, and additionally highlights decommissioning and rehabilitation commitments, and issues such as principles of sustainability.

Midwest is aware of other proposed mining operations which if approved will be developed in close proximity to the Midwest operations in the Blue Hills area. As such the PER for the Midwest DSO mining project will discuss the expected cumulative impacts of all the proposals within the Blue Hills area. Particular attention will be given to the cumulative impacts on priority flora species.

Lastly this document highlights legislation applicable to the proposal, lists consultation events and stakeholders of interest, and identifies the members of the study team that have developed this submission.

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1.0 INTRODUCTION

1.1 BACKGROUND

Midwest Corporation Limited (Midwest) proposes to develop the Koolanooka/Blue Hills Direct Shipping Iron Ore (DSO) Mining Project to mine and process up to 2 mtpa of direct shipping grade iron ore for export, from a combination of three separate pits. The Koolanooka minesite is located approximately 160 km south east of Geraldton and 21 km east of Morawa, and the Blue Hills minesite is located 60 km to the east of Koolanooka (Figure 1). The mines were previously operated from 1966–1972 by WMC Resources Limited as part of the Geraldton Operations Joint Venture (GOJV) consisting of WMC Resources Ltd, Barrick Australia Limited and Australian Hanna Limited.

The Koolanooka/Blue Hills DSO Mining Project involves the recommencement of open pit mining activities from the existing open pit at the Koolanooka mine, development and mining of a shallow oxide pit as an extension to the south east of the existing open pit at Koolanooka, and mining and stockpiling of the pisolitic scree ore to the south and west of this same mine. Most work will be conducted in existing disturbed areas. Crushing and screening facilities for processing and blending varying ore types and grades of DSO will be constructed at the Koolanooka site again on sites that have been previously disturbed.

At Blue Hills depth extensions will occur into the existing East and West Mungada pits. These extensions will require small cutbacks to the existing pits. Run-of-mine ore from Blue Hills will be transported on the pre-existing Mt Karara / Mungada haul road by road-train to Koolanooka where it will be crushed and screened with ore from Koolanooka. The high grade Banded Iron Formation (BIF) ore from Blue Hills will be blended with the screened pisolite lump fraction to achieve an average DSO quality threshold of 58% Fe. Koolanooka oxide ore sourced from the South Fold pit will be crushed and screened to produce lump and fine products.

Ore will be transported by road to a rail siding at Morawa, then by rail to the Geraldton Port where it will be stockpiled in a covered storage facility then loaded for export (Figure 1). The DSO Mining Project is expected to run for a period of 3 to 5 years, with development scheduled to commence in mid 2007.

Midwest is currently exporting previously mined material from stockpiles at Koolanooka (Mining Proposal 4888, approved by the Department of Industry and Resources (DoIR) 21/12/2005) and site and port infrastructure is already permitted and in operation.

The Koolanooka/Blue Hills DSO Mining Project was referred to the EPA under Section 38 of the *Environmental Protection Act 1986* in September 2006 and June 2004. The EPA will formally assess the project on the basis of the potential environmental impacts of the project and has set the level of assessment as a Public Environmental Review (PER) (Current Assessment No 1653, previous Assessment No 1532). The public review period for this PER has been set at 6 weeks.

The Koolanooka DSO Mining Project was also referred to the Department of Environment and Heritage (DEH) and it was determined that the project was not considered to be a Controlled Action under the *Environmental Protection and Biodiversity Conservation Act 1999* (Referral No 2004/1886) (See Appendix A).



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1.2 IDENTIFICATION OF PROPONENT

The proponent for the Koolanooka/Blue Hills DSO Mining Project is Midwest Corporation Limited (Midwest). Midwest will own, operate and manage the project and contact details are as discussed below:

Name	Midwest Corporation Limited
Address	Suite 2, 32 Kings Park Road WEST PERTH 6005
Telephone	(08) 9226 2033
Facsimile	(08) 9226 3388
Point of Contact:	Mr Bill Mackenzie

The project tenement details of relevance are listed below in Table 1.1

The environmental manager and key contact for this proposal is:

Manager Environment: Mark Cannon

ecologia Environment

1025 Wellington Street

WEST PERTH WA 6005

Telephone: +61 8 9322 1944

Fax: +61 8 9322 1599

Email: mark.cannon@ecologia.com.au

TABLE 1.1 TENEMENT DETAILS

Lease	Holder	Area (ha)	Date Granted
M70/1012 (Koolanooka)	Midwest Corporation Ltd	598	18/12/98
M70/1013 (Koolanooka)	Midwest Corporation Ltd	899	18/12/98
M70/1014 (Koolanooka)	Midwest Corporation Ltd	899	18/12/98
G70/158 (Koolanooka)	Midwest Corporation Ltd	9.719	23/01/1992
G70/159 (Koolanooka)	Midwest Corporation Ltd	9.812	23/01/1992
M59/595 (Blue Hills)	Midwest Corporation Ltd	598.71	19/01/05
M59/596 (Blue Hills)	Midwest Corporation Ltd	598.66	24/04/05
L59/62 (Blue Hills Haul Road)	Midwest Corporation Ltd	559.00	21/09/06

1.3 PURPOSE OF DOCUMENT

The purpose of this document is to assist the Environmental Protection Authority (EPA) / and Department of Environment and Conservation (DEC) in scoping the work required to

ensure that all potentially significant environmental issues are properly considered during the Public Environmental Review (PER) period, and through this process to adapt the proposal to provide improved protection of the environment.

This document has been prepared in accordance with the guidelines outlined in the *Guide to Preparing an Environmental Scoping Document* (EPA, June 2002), and the *Guidelines for Preparing a Public Environmental Review / Environmental Review and Management Program* (EPA, November 2004). Also considered during formation were the principles of environmental protection outlined in the EPA Position Statement No 7 *Principles of Environmental Protection* (August 2004), and the EPA Position Statement No 6 *Towards Sustainability* (August 2004).

1.4 PROJECT SCOPE AND TIMING

This Environmental Scoping Document presents the environmental implications associated with the DSO Proposal, and also describes the types and extent of investigations that will be conducted to further address these issues. Key project aspects are summarised in Table 1.2 and the project timeframe is outlined in Table 1.3.

The project components are:

Koolanooka Mine:

- Expansion of the Pit, including a footprint increase for the mine expansion and waste rock area.
- Crushing and screening facility to process the DSO ore deposits.
- Power via diesel generators producing 500 kW.
- Bulk Diesel storage areas to store 100,000 l volume of fuel.
- Portable offices, ablutions, workshop and a first aid facility

Blue Hills Mine:

- Expansion of Mungada East and West Pits including a footprint increase for the mine expansion and waste rock area.
- A small accommodation and workshop facility

TABLE 1.2 KEY PROJECT ASPECTS

Key Aspect	Description
Mining Operations	
Proposed operation commencement	4 th Quarter 2007
Project life span	3-5 years
Anticipated year of decommissioning	2010-2012
Proposed mine locations	Koolanooka and the Blue Hills
Size of ore body	3,995,000 t, 3,425,000 t to be extracted
Ore type	Tightly folded sub vertical haematitic banded ironstone
Ore mining rate	2 mtpa
Overburden mining rate	1.7 mtpa
Total estimated production	1,353,000 cubic metres of ore
Stripping ratio (overburden: ore)	0.85 t of waste rock : 1 t of ore.
Koolanooka mine pit	
Depth of new section	350 m AHD
Depth of water table	Approximately 255 m AHD.
Overburden Stockpiles	External dump volume: 603,000 m ³
Topsoil Stockpiles	Where required, but expected to form minimal surface area.
Area of new clearing Koolanooka	2.4 ha
Blue Hills East pit details	
Depth of new section	330 m RL AHD. Mining will not proceed past the level of the water table without further approval.
Depth of water table	332-337mRL
Overburden Stockpiles	External dump volume: 650,000 bcm (780,000 LCM)
Blue Hills West pit details	
Depth of new section	315m RL AHD. Mining will not proceed past the level of the water table without further approval.
Depth of water table	333-334mRL
Overburden Stockpiles	800,000 bcm (960,000 LCM)
Topsoil Stockpiles	Where required, but expected to form minimal surface area.
Area of new clearing Blue Hills	37.5 ha (33 ha of this is re-clearing of the regrowth edges of the Mt Karara / Mungada haul road on L59/62)
Processing Requirements	
Crushing & Screening	New mobile crushing and screening plant at Koolanooka of 2 mtpa rate.
Product characteristics	Average DSO quality threshold of 58% Fe
Mine Site Infrastructure	
Power source	Supplied by diesel generators.
Anticipated power requirement	500-1000 kW
Water source	Dust suppression water for Koolanooka and Blue Hills will be sourced from the pits and local bores. Potable water will be pumped from a nearby aquifer to the north of the Koolanooka minesite but within Mining Lease M70/1014 and stored on site in suitable tanks.
Anticipated annual water requirement	91.25 ML pa.
Ancillary infrastructure	<ul style="list-style-type: none"> • Power via diesel generators. • Bulk Diesel storage areas. • Portable offices, ablutions, workshop and a first aid facility. • Security facilities. • Existing septic tank and leach drain toilets will be used at Koolanooka. New identical facilities to be built at Blue Hills. • A small accommodation and workshop facility to be built at Blue Hills.

Key Aspect	Description
Total estimated area of clearing	39.9 ha, of which: <ul style="list-style-type: none"> • 2.4 ha is from a TEC* at Koolanooka, • 4.5 ha in the Blue Hills locality, • and 33.0 ha of regrowth on the Mt Karara / Mungada Haul road on L59/62.

* TEC = Threatened Ecological Community

The timing of the proposed development is dependent on successful resolution of outstanding issues and the environmental approval processes. The anticipated timeline for the major elements of the environmental approval process is outlined in Table 1.3 below.

TABLE 1.3 DSO MINING PROPOSAL AND ASSESSMENT SCHEDULE

Tasks	Estimated Time Required	Total Time in Weeks	Completion / Release / Approval Date
Submission of Revised Scoping Document	0	0	Early January 2007
EPA Service Unit Advice on Scoping Document	+2 weeks	(+2)	Mid January 2007
EPA meeting Introduction to the proposal and Scoping document. Delegation to EPA chairman for final acceptance	+2weeks	(+4)	End January 2007
Final Scoping Document accepted by EPA Chairman on incorporation of any issues raised	+2 weeks	(+6)	Early Febuary 2007
Commonwealth approval of Scoping Document (if required)			Currently assessing need to refer Blue Hills Section.
Submission of draft PER document to EPA Services Unit for review	Nominally 6 weeks from approval of Scoping Document	(+12)	Mid Febuary 2007
EPA Service Unit advice on draft PER	Nominally 4 weeks from lodgement	(+16)	Mid March 2007
Proponent response to EPA Service Unit incorporating advice on draft PER	Determined by proponent + 2 weeks	(+18)	End March 2007
Signoff on PER for Public Review by EPA	1-2 weeks	(+20)	Early April 2007
Public review period	6 weeks	(+26)	Mid May 2007
Compilation of Public Submissions by EPA Services Unit	1 week	(+27)	End May 2007
Proponent prepares response to public submissions and responses	1 week	(+28)	Early June 2007

Tasks	Estimated Time Required	Total Time in Weeks	Completion / Release / Approval Date
EPA report to the Minister for the Environment released publicly	8 weeks	(+36)	End July 2007
(State) Minister issues decision on whether the Mining Project can commence	Approx 6 weeks	(+42)	Early September 2007

* The indicative timeline does not include an allowance for the resolution of any appeals.

1.5 Environmental Impact Assessment

1.5.1 State Assessment Process

The Western Australian *Environmental Protection Act 1986* (the Act) provides that where a development proposal is likely to have a significant effect on the environment, the proposal may be referred to the Environmental Protection Authority for a decision on whether or not it requires formal assessment under the Act, and, if it is to be assessed, the level of assessment.

Based on the information in the referral, the EPA determined that the likely environmental impacts are sufficient to warrant formal assessment of the proposal under the Act. The level of assessment for the proposal was set at Public Environmental Review (PER) with a 6 week public review period. No appeals were lodged against the EPA's decision on level of assessment.

This Environmental Scoping Document includes a scope of works for the proposal and has been prepared consistent with the requirements in Section 6.1 of the *Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002*. The purpose of this document is to provide a framework for the formal environmental assessment of the project. This document provides a summary of the existing project environment, potential environmental impacts, proposed management responses, proposed scope of works for environmental investigations, stakeholder consultation programme, project timeline and peer review mechanisms.

Baseline surveys and investigations for environmental aspects of the project are currently being conducted, with management plans for significant aspects of the project to be developed in compliance with regulatory guidelines. Ongoing consultation with regulators, relevant stakeholders and interested members of the public is also being undertaken to include community concerns as part of the assessment process.

At the completion of environmental investigations, a single EIA document with associated management plans will be advertised and released for public comment. The EPA will consider all comments received during the public review period from government agencies and the public, and provide copies of submissions to the proponents for their response. Following completion of the public review period, the proponents will prepare a document

containing a summary of submissions and the proponent's response to the submissions. The EPA will then complete its assessment of the project and submit its report and recommendations on the proposal to the Minister for the Environment.

Appeal rights exist on the EPA's recommendations which are advertised. Appeals will be assessed by the Minister for the Environment. If the Minister determines that the project can proceed, legally binding conditions dictating the environmental requirements with which the proponent must comply will be set pursuant to Section 45 of the *Environmental Protection Act 1986*. These conditions will then be released as a Ministerial Statement.

Once ministerial approval has been granted, the proponent of the DSO Project will obtain approvals to construct key infrastructure under Part V of the *Environmental Protection Act 1986*.

A Works Approval will be applied for and an environmental licence obtained for the construction and operation of the crushing and screening plant. All activities at the site will require licensing as prescribed premises under category 5 of the *Environmental Protection Act 1986* Regulations 1987 Schedule 1 (processing or beneficiation of metallic or non-metallic ore: premises on which 50000 tonnes or more per year of metallic or non-metallic ore is crushed, ground, milled or otherwise processed). The installation of mobile crushing and screening plant will then require a licence under S52 of the *Environmental Protection Act 1986*, in order to operate.

1.5.2 Commonwealth Assessment Process

The DSO Koolanooka project will not require commonwealth approval, as this part of the project is not anticipated to cause a significant impact to matters of national significance, and is not considered to be a Controlled Action under the *Environmental Protection and Biodiversity Conservation Act 1999*. (Appendix A). The Blue Hills project areas and its associated haul road will require confirmation that they are also not viewed by the DEH as a controlled action, as this area was not included as part of the original DSO project and its referral to the DEH, but this is not anticipated to be an issue as Koolanooka and Blue Hills are in close proximity and demonstrate similar species of significance. This confirmation will be provided in the PER.

1.6 PRINCIPLES OF ENVIRONMENTAL PROTECTION

Recent amendments to the *Environmental Protection Act 1986* (Section 4a) have the effect of requiring the EPA to take into account the following principles in the assessment of development proposals:

1.6.1 Precautionary Principle

Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by:

- Careful evaluation to avoid, where practicable, serious or irreversible damages to the environment; and
- An assessment of the risk-weighted consequences to various options.

1.6.2 Principle of Intergenerational Equity

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

1.6.3 Principle of Conservation of Biological Diversity and Ecological Integrity

Conservation of biological diversity and ecological integrity should be a fundamental consideration.

1.6.4 Principles of Improved Valuation, Pricing and Incentive Mechanisms

- Environmental factors should be included in the valuation of assets and services.
- The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.
- The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.
- Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which enable those responses to environmental problems.

1.6.5 Principle of Waste Minimisation

- All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

Midwest has embraced the EPA’s principles of environmental protection as part of project engineering and design. The environmental objective of the project’s design, in order of priority, is to:

- Completely avoid the impact if possible;
- Substitute with a lesser impact;
- Include rehabilitation and engineering solutions to reduce the degree and risk of impact;
- Design operational controls and emergency response around reduction of impact consequences; and
- Provide primary environmental offsets for the impact.

Demonstration of this approach is described in limited detail in this document due to the current phase of project design and engineering however this will be addressed in more specific detail in the PER document. The application of principles of environmental protection to the project includes consideration of alternative designs for the project, the extent of environmental investigations being proposed, the level of stakeholder and community consultations and the commitment to environmental awareness training of personnel for construction and operation phases of the project. The current responses to the expectations of these principles are summarised in Table 1.4. The DEC will be consulted on advice for preservation and / or conservation projects to which the proponent can contribute as primary and secondary offsets to project impacts. Specific offsets will be proposed and discussed as part of the PER document.

In addition, the proponent will develop and implement an Environmental Management Plan (EMP) for this project, within the framework of an Environmental Management System (EMS) based on ISO14001 criteria. The EMS will provide a systematic process for ensuring compliance with legal requirements, minimisation of environmental impacts, and continual improvement in environmental performance.

TABLE 1.4 APPLICATION OF SUSTAINABILITY PRINCIPLES TO THE KOOLANOOKA/BLUE HILLS DSO MINING PROJECT

PRINCIPLE	Relevant Yes / No	If Yes Consideration
<p>The Precautionary Principle</p> <p>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental</p>	<p>No</p>	<p>Sufficient knowledge is able to be obtained to address potential environmental impacts.</p>

PRINCIPLE	Relevant Yes / No	If Yes Consideration
<p>degradation.</p> <p>In application of this precautionary principle, decisions should be guided by:</p> <p>(a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</p> <p>(b) an assessment of the risk-weighted consequences of various options.</p>		
<p>The Principle of Inter-generational Equity</p> <p>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</p>	Yes	Emissions are not long term. Greenhouse emissions are insignificant with respect to EPA Guidance Statement No 12.
<p>The Principle of the Conservation of Biological Diversity and Ecological Integrity</p> <p>The conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	Yes	The Mining Project will result in new clearing of a small area of TEC (2.4ha) immediately abutting existing disturbance to the Koolanooka Hills, plus 4.5ha of new clearing abutting the pits at the Blue Hills, and 33ha clearance of roadside verge. Appropriate flora and fauna surveys have been undertaken, and rehabilitation commitments have been made.
<p>Principles relating to improved valuation, pricing and incentive mechanisms</p> <p>(a) Environmental factors should be included in the valuation of assets and</p>	Yes	The only ongoing pollution expected on this project is waste disposal, Midwest will cover costs as

PRINCIPLE	Relevant Yes / No	If Yes Consideration
<p>services;</p> <p>(b) The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance and abatement;</p> <p>(c) The user of goods and services should pay prices based on the life cycle of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste;</p> <p>(d) Environmental goals, having been established, should be pursued in the most effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems.</p>		<p>required to dispose of site wastes in an appropriate manner. However, no incentive structures / market mechanisms are applicable to this project.</p>
<p>The Principle of Waste Minimisation</p> <p>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge to the environment.</p>	<p>Yes</p>	<p>This will be clearly addressed in the project EMS and EMP.</p>

2.0 PROJECT DESCRIPTION

Midwest proposes to develop the Koolanooka/Blue Hills Direct Shipping Ore (DSO) Mining Project to mine and process up to 2 mtpa of direct shipping grade iron ore for export. The Koolanooka/Blue Hills DSO Mining Project involves the recommencement of open pit surface mining from the existing open pit at the Koolanooka mine, comprising the development of a shallow oxide pit to the immediate south east of the existing open pit, and mining and stockpiling of the Pisolitic scree ore to the south and west of the existing mine. Mining at Blue Hills will entail cutbacks and depth extension of the already existing Mungada East and Mungada West pits (Figures 3, 4a & 4b).

A crushing and screening facility for the processing and blending of the various types and grades of DSO will be established at the Koolanooka site. The high grade BIF ore from Blue Hills will be transported to Koolanooka and blended with the screened pisolite lump fraction from Koolanooka to achieve an average DSO quality threshold of 58% Fe.

Ore will be transported from Blue Hills to the Koolanooka site via the existing Mt Karara/Mungada Haul Road, which will be upgraded from its present state. Export product be transported from Koolanooka along existing roads to a rail siding at Tilley, near Morawa, where it will be loaded and transported to the Geraldton Port for export. The use of the Mt Karara/Mungada Haul Road for transportation of ore from Blue Hills to the gazetted Shire Road (Mungada Road) will require the haul road to be reinstated back to its original width to accommodate haulage trucks.

At a later date, a small section of haul road to the south of Koolanooka will link the Koolanooka site more directly with the Blue Hills haul road. Until this occurs ore will be trucked by road train on a slightly longer route on established roads. This haul road section will be reinstated later in 2007 due to seasonal surveying time constraints in late 2006. As such, appropriate vegetative surveying and clearance approval for this work will be sought as an amendment to the PER, and this aspect should not be considered part of this PER application.

The Koolanooka/Blue Hills DSO Mining Project is expected to run for a period of 3 to 5 years, with development scheduled to commence in the 4th quarter 2007.

Most of the land surrounding Koolanooka is currently used for agriculture. The land surrounding the Blue Hills area is proposed conservation reserve managed by DEC.

2.1 MINING

Conventional open pit mining techniques will be utilised at Koolanooka and Blue Hills on this project, drilling and blasting, excavation, loading and hauling will be conducted as per the mining schedule.

2.1.1 Koolanooka

Commencement of mining at the Koolanooka/Blue Hills DSO Mining Project will start with the establishment of access to the South Fold cut-back area (Figure 3). Mining of this reserve is expected to take 12 months, and will commence from the 400 m RL AHD. for a projected 50 metres to the 350 m RL contour. Mining will then commence on the Pisolite orebody to the west of the existing Koolanooka pit (Figure 3). The entire operation is expected to take a minimum of 24 months.

Figure 3 provides a plan view of the Koolanooka Mining Project area and Figure 5 provides a geological cross section of the mine.

It is not the intention of the cross section to demonstrate conclusively the nature of the substrate to be mined, with such a two dimensional diagram that would be impossible for all situations. Rather this gives a general overview of the strike to be mined. The potential for acid forming material will be demonstrated in other ways, from physical observations on pre-existing mine features, and through sample analysis from varied locations in the impact area, with respect to the EPA guideline “Identification and Investigation of Acid Sulphate Soils”.

The South Fold orebody will be excavated from a cut back to the immediate south-southeast of the old pit with ore being transported to the plant site via a combination of existing and new haul roads. The remnant and pisolite ores will be accessed from existing mining benches on the western wall of the pit.

The South Fold orebody outcrops at the top of the unmined hill to the immediate south-southeast of the existing Koolanooka Pit. The haematitic BIF outcrops extensively and in these areas there is very little residual topsoil, if any, requiring stockpiling since mineralisation extends to the ground surface.

2.1.2 Blue Hills

A plan view of the Blue Hills Mining Project area is illustrated in Figures 4a & 4b. Geotechnical criteria are based on parameters established from the existing open pits, which have been stable for over 30 years. For the pit optimisations in both Mungada East and West, an overall wall angle of 45° was used.

Practical pit designs were generated from the optimal pit shells. Haul ramps within the pits are 12m wide, have a 1:9 gradient ratio, and have been designed to cater for medium size mining equipment up to 85 tonne class operating in single file. It is anticipated that all material will require drill and blast. Broken ore and waste will be loaded using hydraulic excavators in backhoe configuration. In most cases, a 5 m deep drop-cut has been included in each design to maximise ore extraction.

At Mungada East, waste rock will be dumped to the west and south of the existing dumps, and at Mungada West, waste rock will be dumped around and to the north of the existing waste dump on the eastern flank of the BIF ridge. The dumps will form extensions to the existing waste landform. Much of these extensions will cover areas that were previously cleared during historical mining activities. Ore will be transported by a typical mining fleet

to ROM pads adjacent to the existing pits on previously disturbed ground. From there, it will be transferred by triple road train to Koolanooka.

2.2 ORE PROCESSING

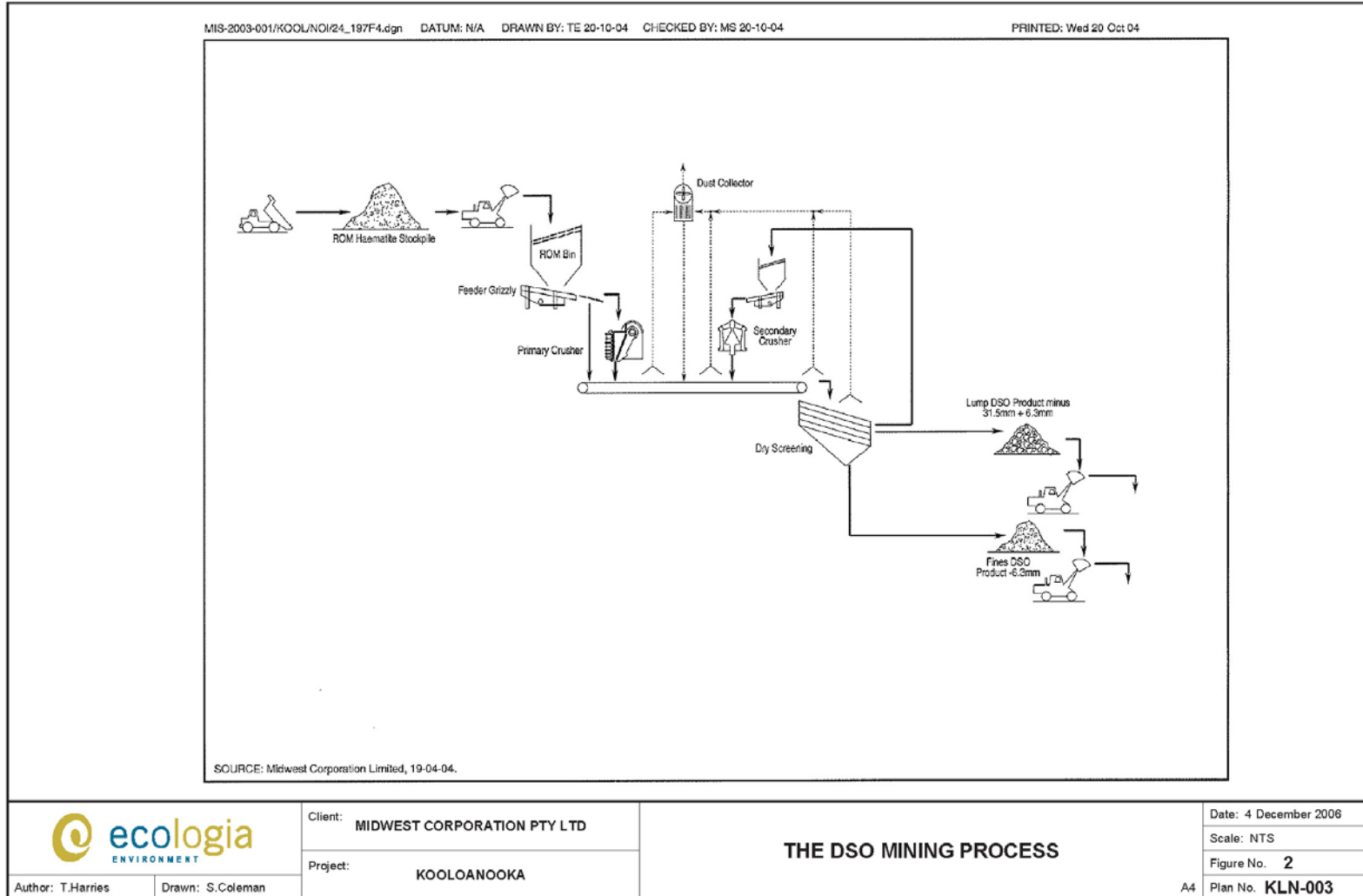
The haematitic ore will be trucked by existing haul roads to a mobile crushing and screening plant located on the site of the original WMC crushing circuit at Koolanooka. The ore will be dry screened into lump ore (>6mm) and fine ore (<6mm). The two products will be stockpiled on existing cleared land near the crushing and screening plant for transportation offsite. Figure 2 details the proposed mining method.

The pisolitic ore, scheduled to be mined in Year 2, will be stockpiled for use in future projects or blended to a saleable product when sufficient high grade material becomes available.

The high grade BIF ore from Blue Hills will be blended with the screened pisolite lump fraction from Koolanooka to achieve an average DSO quality threshold of 58% Fe. No ore processing will be conducted at Blue Hills.

No chemicals or reagents will be used in the processing of the haematite or pisolitic ores.

It is not anticipated that acid mine drainage will be an issue for material handling and management as existing waste rock dumps around the two sites from previous mining activities do not demonstrate any evidence of sulphidic material or acidic discharge. This issue will be discussed further in the PER.



2.3 WATER REQUIREMENTS

Mining of the haematite ore at the Koolanooka site is a dry operation in terms of ore processing, however water will be required to control dust at the mobile crushing and screening plant. Approximately 250 kl/day will be required for dust suppression. This water will be obtained from groundwater obtained from local bores in the fractured BIF and quartzite strata flanking the Koolanooka Hills and from the existing pit waters in the bottom of the Koolanooka pit. These waters will be blended if necessary before use to reduce total salinity concentration to acceptable levels for dust suppression activities. Potable water for Koolanooka facilities will be obtained from the Morawa Shire.

Potable water for the Blue Hills camp and water for dust suppression at Blue Hills will be drawn from nearby bores. One bore is existing but this may need to be supplemented with additional bores for which groundwater licences will be obtained as necessary. The exact details of water supply and water demand at Blue Hills will be detailed in full in the PER document, and Midwest will obtain approvals from the Department of Water as necessary.

For any new bores to be installed for use on this project, Midwest Corporation will seek appropriate licensing from the Department of Water, both for bore construction and for groundwater extraction.

2.4 SUPPORT FACILITIES AND RESOURCE REQUIREMENTS

2.4.1 Power

Electrical power required for the crushing and screening circuit and associated infrastructure at Koolanooka and Blue Hills will be approximately 500-1000 kW (below the threshold requiring licensing) and will be supplied by a portable diesel fuelled power generator(s), maintained and operated by a contract equipment supply company. Diesel for the generators will be stored on site in bunded fuel tanks.

Part of the fuel mix to be utilised on this project will be biodiesel sourced locally, and through use of this product Midwest will be supporting the growth of this industry in the region. The proponent is prepared to look into the viability of other power supply alternatives for the provision of power to work areas and will do so on a case by case basis.

2.4.2 Buildings

At Koolanooka portable offices, ablutions, workshop and a first aid facility are located adjacent to the DSO plant site on pre-existing concrete pads, which were the foundations to the WMC administration infrastructure.

A small accommodation camp (50 person maximum) and workshop facility will be established on site at Blue Hills within previously disturbed areas. An explosives magazine storage area will also be installed.

2.4.3 Sewerage & Waste Disposal

No onsite waste disposal will occur during this project and no site landfill will be created. All project generated waste materials will be removed by a licenced contractor, and disposed of appropriately at the Morawa community landfill. It is the intention of Midwest to provide best practice waste management on this project.

A septic tank and leach drain toilet block currently exists on the Koolanooka site. Approval for this has already been granted by the Shire of Morawa. An accommodation block will be built at the Blue Hills site, with sewerage facilities using the same system as at Koolanooka. The standard health department permit for these facilities, administered by the Shire of Perenjori, will be obtained by Midwest.

There will be nil discharge of dewatering effluents to the environment, other than Koolanooka pit waters utilised for dust suppression, where appropriate. Ore processing will utilise dry screening and crushing with dust suppression as necessary.

2.4.4 Fuel & Explosives Facilities

All site fuel and explosive materials will be stored in the workshop location area to be installed at Koolanooka as indicated in Figure 3. It is the intention to Midwest to provide best practice hydrocarbon management on this project.

Diesel fuel for the diesel power generator(s) will be stored in tanks sized for four weeks supply (approximately 100,000 l) in either a double skinned storage tank or an earth bunded area adjacent to the generators, each of which is expected to have a separate tank holding a day's supply of fuel.

Diesel to be used by the mining contractor will be stored in supplied tanks that will be appropriately bunded according to the Australian Standard for storage and handling of flammable and combustible liquids (AS1940). The containment volume within the bunds will be in accordance with DECP requirements and will be equal to the total volume of fuel stored with further excess capacity for stormwater. Alternatively double skinned tanks may be used.

Lubricating oil for the process plant equipment will be stored in 200l drums in a bunded section of the workshop/stores building or on self bunded trays.

Explosives will be stored in dedicated explosives magazine areas at both sites.

2.4.5 Process Reagents and Chemicals

Neither reagents nor chemicals will be utilised during ore processing activities on the DSO project.

2.5 PRODUCT SHIPMENT

Ore will be transported from the Blue Hills mine site to the Koolanooka minesite in triple road trains. From Koolanooka ore is currently being transported via Munckton Road, Morawa-Yalgoo Road, Morawa-Mingenew Road to Mingeneu, Midlands Road to Dongara, Brand Highway and the Geraldton Southern Transport Corridor to Geraldton Port (Figure 1). Trucks are 27.5 metres total length and tow two trailers that are covered with tarpaulins to minimise dust. It is proposed that in the future trucks will be used to haul ore from Koolanooka to a proposed siding located at Tilley, approximately 2 km north of Morawa on the existing Westfield rail network. From there it can be railed in 3,000 t unit trains to Geraldton.

Once at Geraldton Port, the ore will be stockpiled inside a shed to minimise dust. The shed is owned by Midwest and located on land adjacent to Berth 4. This facility is currently in use for the fines project (NOI 4888). Ore will be unloaded from the trucks and loaded onto ships through conveyors with a dust management system including dust extractors at transfer points as is currently used. Operations at Geraldton Port will be managed by Geraldton Port Authority as part of their Environmental Licence issued under Part V of the *Environmental Protection Act 1986*.

The transport of DSO product is the same as that previously assessed by DoIR (in NOI No. 4888) entitled *Addendum to the Transportation of Stockpiled Fines Koolanooka Iron Ore Mine to Geraldton Port* (ATA, 2004).

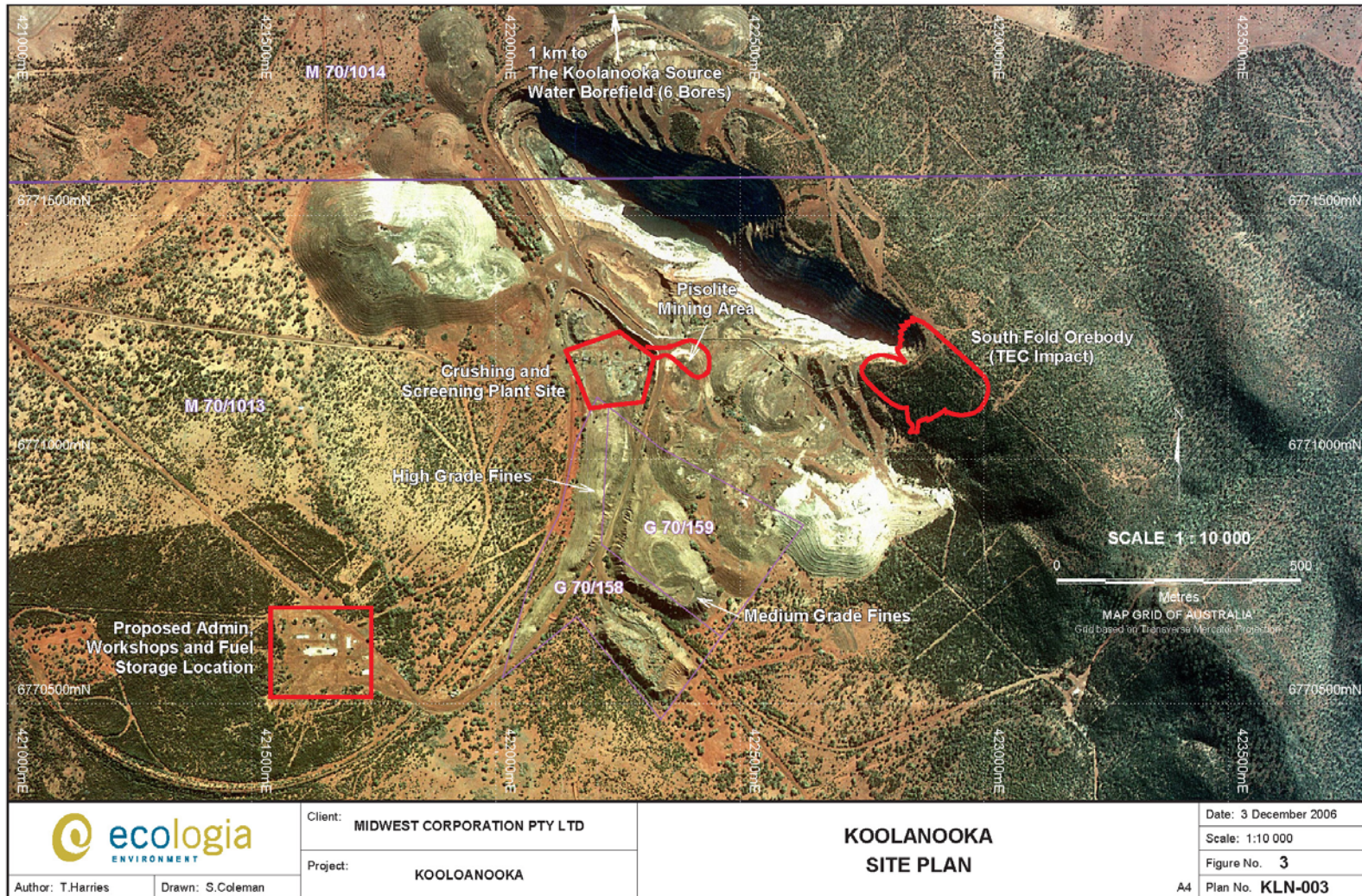
Other documents of relevance to this proposal include: the Geraldton Port Authority Works Approval 4150 and overarching Licence to Operate 4275/9 for the Port of Geraldton, a Notice of Intent (4888) for the transportation of stockpiled fines from Koolanooka, a Commercial Goods Vehicle Licence for bulk transport of ore, and a Road Train Permit Agreement with the Shire of Morawa.

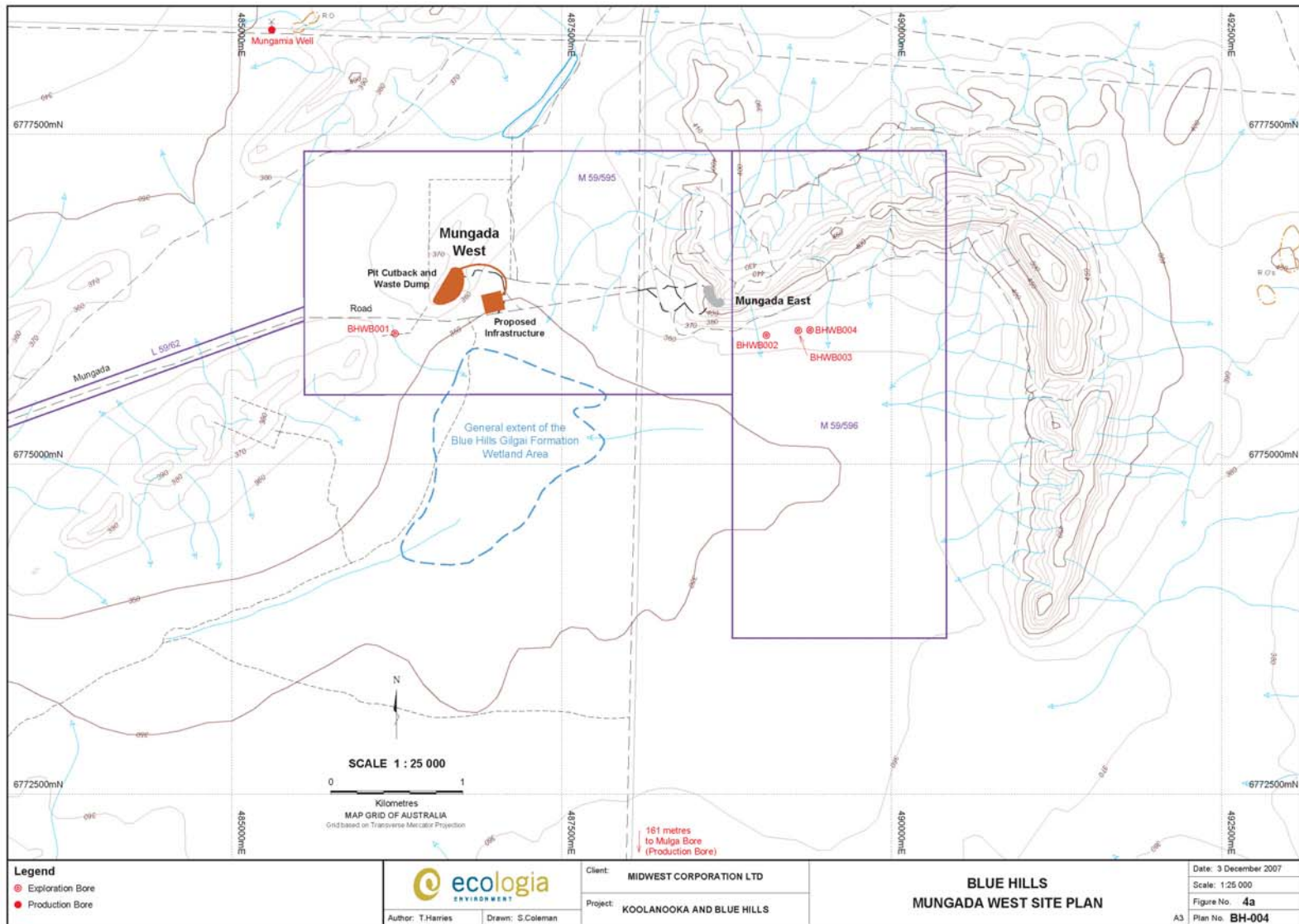
2.6 WORKFORCE

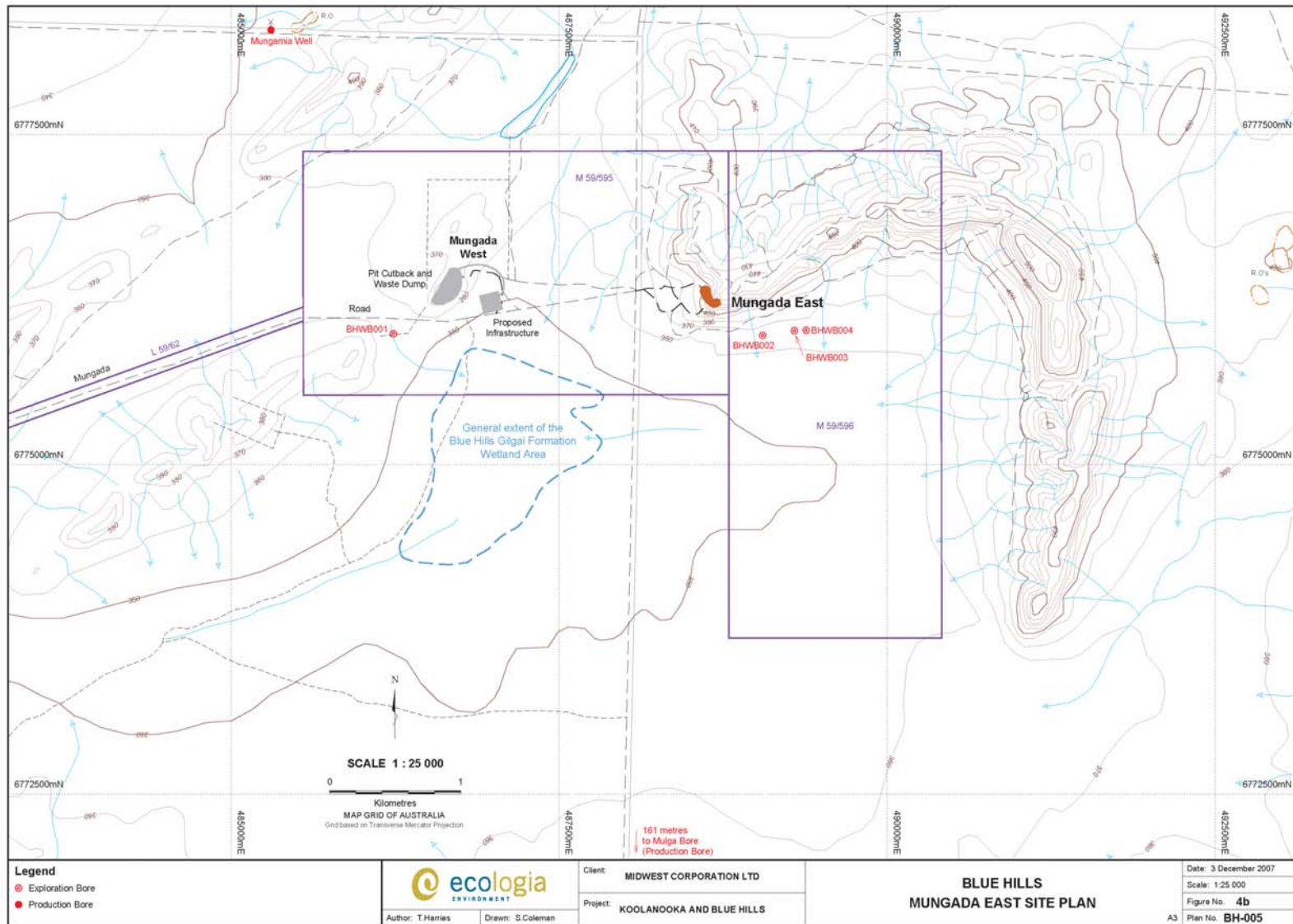
The DSO Mining Project at Koolanooka will have an operational workforce of 24, with technical support provided by 5 Midwest staff.

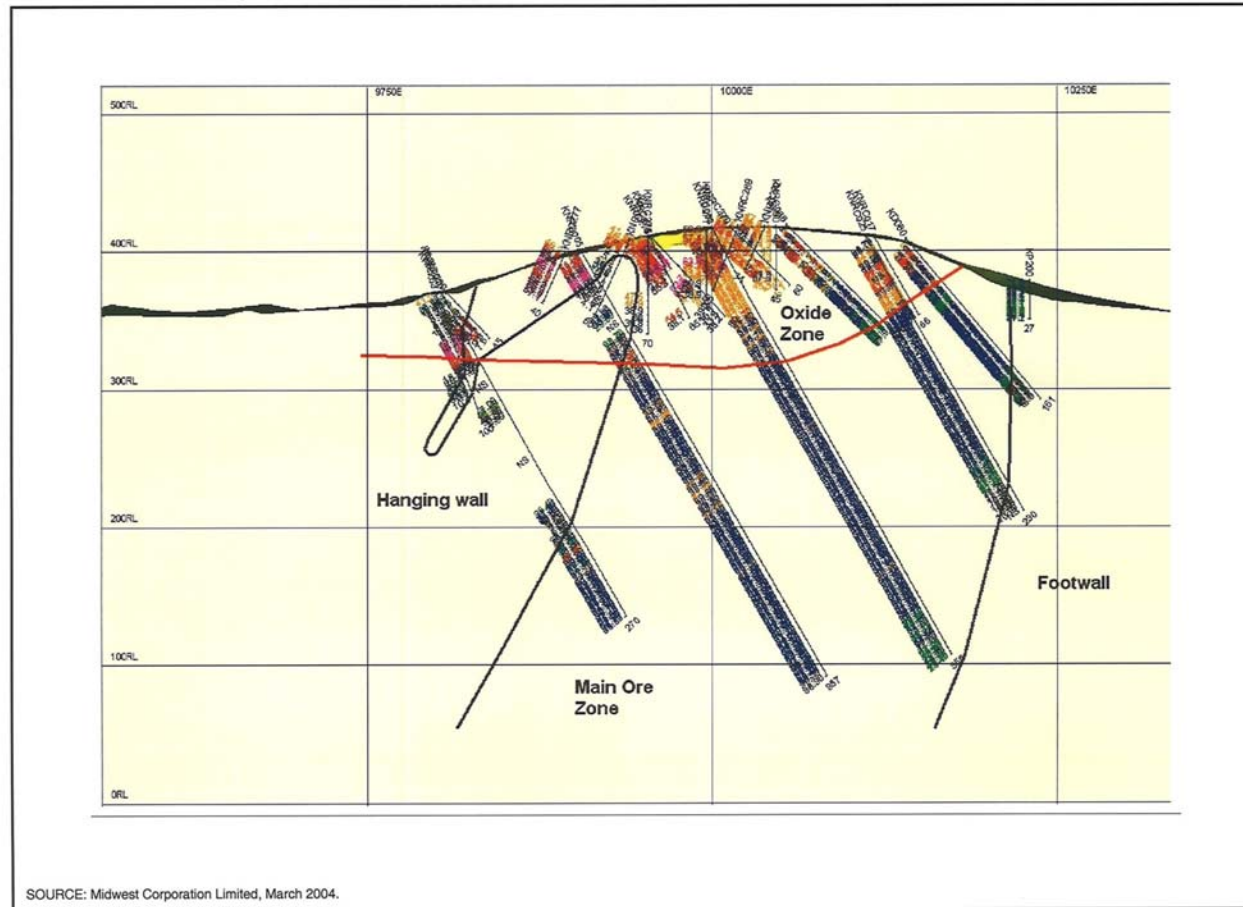
The operational workforce will be housed in Morawa and will travel to site daily via the upgraded Munckton Road.

The Blue Hills workforce will comprise a team of approximately 30 operational staff, to be housed in an accommodation camp (50 person maximum) on site.









ecologia
ENVIRONMENT

Author: T.Harries Drawn: S.Coleman

Client: MIDWEST CORPORATION LTD
Project: KOOLANOOKA AND BLUE HILLS

**GEOLOGICAL CROSS SECTION
OF THE KOOLANOOKA MINE**

Date: 4 January 2007
Scale: NTS
Figure No. 5
A3 Plan No. KLN-006

3.0 BASIS FOR JUSTIFYING PROPOSAL AND SELECTION OF PREFERRED ALTERNATIVE

Direct Shipping Grade Iron Ore (DSO) was previously mined at Koolanooka and Blue Hills in the late 1960s-early 1970s.

The mines are well located, serviced by good quality all weather roads and close to infrastructure. The town of Morawa is located 19 km to the west and the Port of Geraldton, is approximately 160 km from the Koolanooka mine site (Figure 1).

Other project locations were not compared for suitability against this proposal, as the works proposed on this project aim to be largely conducted within pre-existing pits and on sites that were previously disturbed. This restricts options of project layout flexibility but provides reduced new environmental impact due to the pre-disturbed state of sites and associated haul road network.

The DSO Mining Project has been designed to minimise environmental impacts. Haul roads, waste dumps, ore stockpiles and infrastructure will all be located on previously disturbed land. Open cut access to the haematite and pisolite ore abutting the existing pit at Koolanooka will require only 2.4 ha of vegetation to be cleared, although area is now classified as having high conservation value and part of a TEC. 4.5 ha will require clearing at the Blue Hills area, and roughly 33.0 ha of regrowth vegetation will require clearing to repair the Mt Karara / Mungada Haul road to a functional state.

If the project is not developed, the potential impacts listed in Section 5 will not be carried out, and additionally the potential social and economic benefits generated for the Midwest District and Morawa, including diversification of employment opportunities at a time of regional drought, will not be realised.

4.0 REGIONAL SETTING AND EXISTING ENVIRONMENT

4.1 GENERAL

4.1.1 Koolanooka

The Koolanooka minesite is located within the Shire of Morawa approximately 160km east south-east of the Port of Geraldton (Figure 1). Surrounding lands also covered by the project mining leases are generally held freehold by local pastoralists.

The mine site is at the north-western end of Koolanooka Hills which rise approximately 140m above the surrounding undulating plain striking north north-west to south south-east for 13km. These hills are composed of banded iron formation (BIF), which is preferentially resistant to erosion.

The Koolanooka mine site was previously mined from 1966 to 1974 as part of the Geraldton Operations Joint Venture (GOJV) and a large proportion of the land north of Koolanooka Springs Road has been previously disturbed.

The plains surrounding Koolanooka Hills are generally used for agriculture predominantly wheat and sheep farming.

Land tenure

The mining and processing at Koolanooka will occur on Mining Lease 70/1013 and Mining Lease 70/1014. The whole of the existing and proposed disturbance occurs on private land lot 1 which is owned by Midwest Corporation Ltd.

The export ore will be trucked along Munkton Road and Morawa-Yalgoo Road, both vested in the Shire of Morawa, to General Purpose Lease (G)70/221. Ore handling operations on G70/221 are subject to a separate mining proposal to be submitted to the Department of Industry and Resources in the near future.

Processing and potable water for Koolanooka operations will be obtained from a combination of the Koolanooka pit itself and from bores within the vicinity of the mine.

See Table 1.1 for further tenement details.

4.1.2 Blue Hills

The Blue Hills mines are located on Karara Station within the Shire of Perenjori approximately 220 km east of Geraldton and 60 km east of Koolanooka (Figure 1). Within the vicinity of the mine, the Blue Hills range consists of banded iron formations, similar to the Koolanooka Hills and the name given to this ridge line is Windaning Ridge. Dips are generally steep and where the ironstones outcrop the topography is often rugged.

Exploration was conducted for iron ore deposits in the area in the 1960s and 1970s, and two high grade iron ore deposits, Mungada East and Mungada West, were mined between 1972 and 1974. Records show that the Mungada West mine was still in high grade ore when mining ceased following the satisfaction of the supply contracts then in place.

The area surrounding Blue Hills was formerly a pastoral lease, but is now a CALM Purchased Lease (CPL) 16 vested with the Conservation Commission, and is under direct management by the Department of Environment and Conservation. A Conservation Park is proposed for the area.

Land tenure

Mining, infrastructure areas and overburden stockpiles at Mungada East and West pits will occur on Mining Lease 59/595 which overlies Conservation and Land Management (CALM (now Department of Environment and Conservation)) Purchased Lease CPL 16 (Karara Station)

The haul road on Miscellaneous Licence 59/62 (Mungada to Koolanooka) overlies CPL 16 at its eastern end and continues onto CPL 23 at its western end. It then continues west onto State Timber Reserve 2, Vacant Crown Land (VCL 12727) and into TEC 359Shb01. At its western end it connects directly with the Mungada public road vested in the Shire of Morawa. The haul route then continues along the Koolanooka Spring Road to Fallon Road from which it enters the Koolanooka minesite and processing area.

Processing and potable water for the two Mungada operations will be obtained from bores within the vicinity of the mines.

See Table 1.1 for further tenement details.

4.2 CLIMATE

The climate in the Koolanooka / Blue Hills area is semi-arid with a mean annual rainfall of approximately 335mm. Annual evaporation is 2,315mm and far exceeds the annual rainfall. Monthly average rainfall and temperatures recorded at Morawa, 21 km to the west of the mine site are illustrated in Figure 6.

Wind roses for Morawa demonstrate that the wind regime is highly seasonal (Figure 7). During summer, morning wind speeds of 11km/hr to 30km/hr from the north-east and south-east prevail, shifting to the south and south-west in the afternoon. During the winter months, winds abate to generally less than 10km/hr, with less distinctive wind patterns. The combination of high wind speeds and high temperatures during summer produces elevated evaporation rates. Prevailing ambient dust levels are extremely high in these conditions.

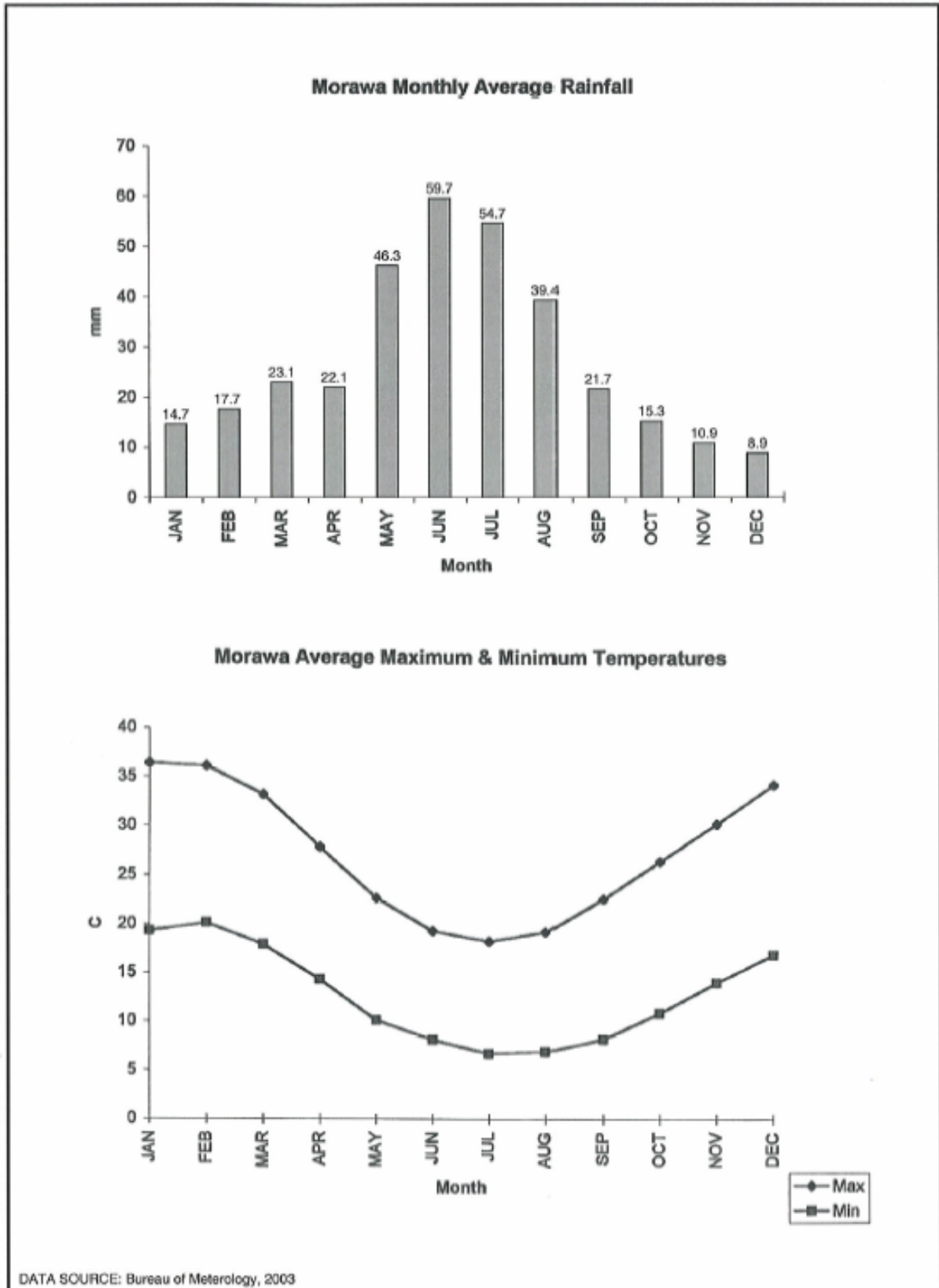


Figure 6: Rainfall and Temperature of the Koolanooka / Blue Hills Area

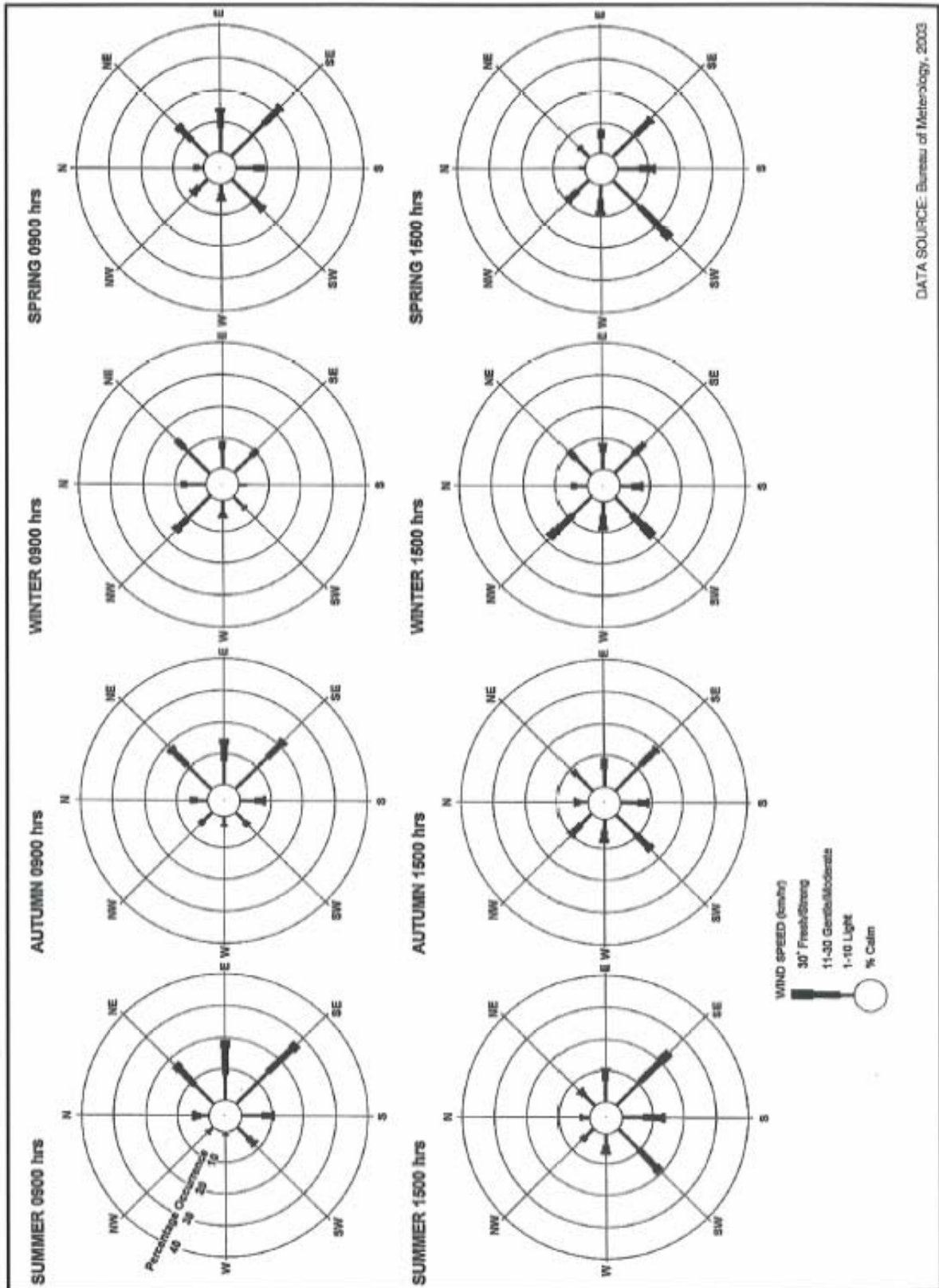


Figure 7: Wind Regime of the Koolanooka / Blue Hills Area

4.3 BIOREGIONS

The Koolanooka study area is located within the Avon-Wheatbelt Bioregion of Australia (Thackaway and Cresswell, 1995), in relatively close proximity to the intersection of the South-Western and Eremaean Botanical Provinces of Western Australia. The study area is located within the Perenjori Botanical District (Beard, 1976).

The Blue Hills occurs on the boundary between the Austin Botanical District of the Eremaean Botanical Province and the Avon Botanical District of the Southwest Botanical Province (Beard, 1990), hence it is an interzone.

4.4 GEOLOGY AND SOILS

Koolanooka

The major land systems in close proximity to the Koolanooka mine site are the Koolanooka, Pindar and Noolagabbi land systems. Small amounts of the Morawa and Mount Nunn land systems also occur in the area (Rogers, 1996).

The Koolanooka land system comprises the Koolanooka Hills, a range of rolling to very steep low hills with gently inclined foot slopes, which have been extensively cleared for agriculture. The system comprises a complex of Archaean and Proterozoic rocks. Soils are rocky or stony and commonly shallow, grading to red gravelly loams.

The Pindar Land System is associated with the gently undulating sandplain with long gentle slopes that surrounds the Koolanooka Hills. This system has been even more extensively cleared for agriculture than the Koolanooka Land System, primarily for cropping and grazing. Soils are moderate to deep acidic sands with areas of gradational sands on ferruginous gravel and gritty sands on gravel.

The Noolagabbi land system is extensive level to very gently inclined flats and lower slopes found at the base of broad valleys. Extensively cleared for agriculture, the Noolagabbi system comprises quaternary alluvial and colluvial material forming valley infill on broad mature valleys often associated with saline drainage networks. Soils are relict red sands, loams and clays over a red-brown hardpan.

Blue Hills

The main Land Systems in close proximity to the Blue Hills mine site are the Tallering, Tealtoo, Yowie, Cunyu and Pindar Land Systems (Payne et al, 1998).

The Tallering Land System is characterised by prominent ridges and hills of banded ironstone, dolerite and sedimentary rocks. The soils of the hillslopes and ridges are shallow red earths and stony red earths with smaller areas of red clayey sands with ferruginous gravel found on the stony and gravelly plains.

The Tealtoo Land System consists of depositional surfaces of level to gently undulating loamy plains with fine ironstone lag gravel. The soils are deep red earths on ironstone gravel or hardpan, shallow hardpan loams and shallow red clayey sands with ferruginous gravel on hardpan or gravel.

The Yowie Land System dominated by loamy plains has soils of variable depth red clayey sands, hardpan loams and red earths on hardpan. Smaller areas of variable depth red clayey sands with ferruginous gravel over hardpan and deep red earths and juvenile alluvial deposits occur on the gravelly plains and narrow drainage tracts of the land system.

The Cunyu Land System is characterised by calcrete platforms and intervening drainage floors and minor areas of alluvial plains. Soils of the calcrete platforms and plains are shallow red clayey sands or shallow calcareous loams, on calcrete. Soils of the alluvial plains also include shallow duplex on hardpan and deep duplex.

The Pindar Land System is associated with loamy plains surrounded by sandplain. Soils of the loamy plains are deep and shallow red earths on hardpan and occasionally shallow red clayey sands on hardpan. The soils of the sand sheet areas are deep red clayey sands.

Waste Rock Stockpiles

Waste rock stockpiles produced by the DSO Mining Project (haematite and pisolite) are expected to amount to 1.53 million tonnes. The haematite and pisolite ore at Koolanooka have very low sulphur content and contains no pyritic shales; with the modelled total sulphur in the haematite ore being 0.149% and 0.051% in the pisolite ore. Midwest's position is that given the low sulphur content of the ore, and the lack of any observable issues concerning wasterock stockpiles generated from previous mining, the potential for acid generation is likely to be minimal. This position will be supported by the results of a brief NATA accredited sampling series on relevant soils at all three pits, the results of this sampling series will be discussed in the PER for this proposal.

The waste rock generated in the DSO Mining Project will be stockpiled on land which was previously cleared. It will also be used for construction purposes (eg road base material and bunding operations). Design criteria will be developed for the stockpiles to take account of the geotechnical and erosion characteristics, local topography, crest water management and visual amenity.

At Mungada East, waste rock will be dumped to the west and south of the existing dumps, and at Mungada West, waste rock will be dumped around and to the north of the existing waste dump on the eastern flank of the Banded Iron Formation (BIF) ridge. The dumps will form extensions to the existing waste landform. Much of these extensions will cover areas that have already been cleared during historical mining activities.

Topsoil Stockpiles

Topsoil stockpiling will be conducted where necessary and pre-disturbed areas will be utilised as designated stockpile areas as required. Topsoil stockpiling is expected to be minimal as the majority of the project area is already cleared of vegetation, and as there is minimal topsoil available naturally in some areas. As far as possible topsoil will be directly placed onto areas ready for revegetation. Consideration will be given in the PER regarding alternative topsoil resources for rehabilitation if sources present prove inadequate.

4.5 TOPOGRAPHY AND SURFACE DRAINAGE

Geoconservation

Geoconservation in Western Australia to date has been primarily limited to the recognition of geological monuments such as those identified in Lemmon, et al (1979), however the concepts and principles of Sharples (2002) will be incorporated into the assessment of geoconservation of the BIF at Koolanooka and Blue Hills. Geoconservation deals with the non-living parts of the environment – geological features, landforms and soils. Sharples (2002) emphasises that biodiversity is dependant upon geodiversity and successful nature conservation requires the integration of bioconservation and geoconservation.

Transportation of the ore will be by road. Drainage of the minor streams that the haul route crosses is maintained with culverts and/or floodways. The DSO Mining Project is therefore likely to have little impact on surface water runoff.

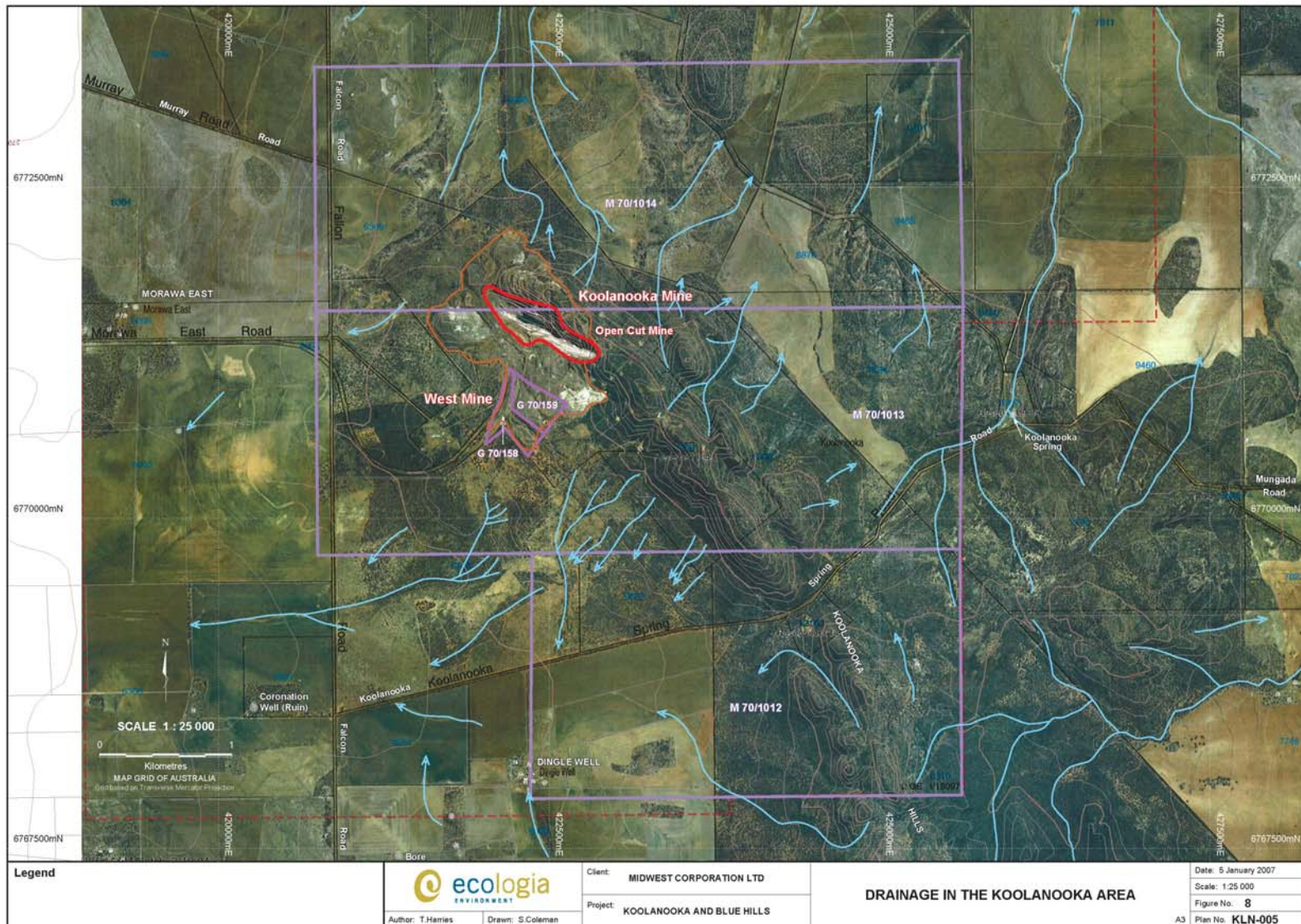
4.5.1 Koolanooka

The proposal area has low topography, with elevations generally between 250 and 400 m AHD with prominent ridges such as Koolanooka Hills attaining 450 m AHD (about 100 m above plain level). The Koolanooka Hills are an elevated topographical feature of BIF.

The previous mining operations are clearly visible from the plains to the west of the Koolanooka Hills. The existing Koolanooka mine site has been used as an informal lookout and picnic area.

Koolanooka Spring, a near surface, ephemeral creek line that relies on recent rainfall is located 4 km to the south east of the DSO Mining Project between two granite hills, draining northwards. There is no surface water or flow in the dry months of the year. The spring is reported to carry water in wet seasons, which is attributed to seepage of local rainwater through the soil and weathered bedrock from adjacent hills and slopes onto the gully floor (Rockwater, 2004).

Drainage is mainly weak and low-gradient, predominantly to the Mongers Lake palaeodrainage system which passes a few kilometres to the north of Koolanooka Hills and includes the Yarra Yarra Lakes to the west of Carnamah (Rockwater, 2004) (Figure 8).



4.5.2 Blue Hills

The Blue Hills form some of the highest elevations in this area exceeding 500 m AHD in a series of eastern ranges.

The only surface water feature of note within the Blue Hills region is a natural gilgai formation approximately 700m due South of the East Mungada pit, however, it is not anticipated that the project will influence this feature as it is well away from the existing pit, and proposed activity. Additionally, hydrocarbon and waste management at the East and West Mungada pits will contain any potential emissions of these products from these sites as described in Sections 2.4.4 and 5.9 of this scoping document, and in the EMP and EMS for this proposal.

The PER will further discuss relevant management considerations, if necessary, to ensure this area is protected from mining related influence. The proponent would like to note that this area has been previously identified as a Gilgai formation, rather than a wetland (Corbett, 1969).

4.6 HYDROGEOLOGY

Approval is only being sought to develop new pit expansions to the depth of the water table at both of the DSO Koolanooka and Blue Hills project areas, and no excavation past the water table is intended. Consequently no dewatering will be required from either pit area. A variation to the project approval will be sought by Midwest, for excavation below the water table and for any subsequent dewatering, if this is required in the future.

All appropriate water source licences will be gained and kept up to date as necessary on the DSO project, and if additional bores need to be installed to fulfil supply demands, then this will be discussed in the PER.

4.6.1 Koolanooka

The regional ground water level generally occurs at around 255 m AHD. Annual evaporation far exceeds annual rainfall, however some minor subsurface recharge does occur during intense rainfall events.

The existing Koolanooka pit is reported to have produced water (at an unknown rate) when it was operated by Western Mining Corporation. Groundwater in the bottom of the existing pit is saline but personal communication with ex WMC employees suggests inflowing groundwater during previous mining operations was relatively fresh (Johnston, pers com., 2004). The pit currently contains a water body measuring about 9,600 m² in area and estimated 8 m in depth. Water level is about 285 m AHD. A recent sample has a salinity of 20,000 mg/l TDS (57% of the salinity of seawater). Calculations for a water body of 8 m depth suggest that the original salinity of the groundwater would have been about 2,500

mg/l TDS. Given that groundwater inflow does not keep pace with the summer evaporation of about 11 mm/d, the rate of inflow into the pit at current rates is calculated to be less than 110 m³/d (Rockwater, 2004).

The proposed mining of the South Fold and Pisolite orebodies will occur within existing disturbed areas. The South Fold orebody is effectively a cut-back to the south-east of the existing pit and the lowest level of the proposed pit will be approximately 68 m above the free standing water table in the pit and 95 metres above the known in-ground groundwater table. Similarly, the pisolite orebody to the west of the existing pit is also considerably higher than the regional water table and the mining of this orebody will not disturb ground or surface waters.

Mine pit dewatering will not be required as the sections of project excavation on the Koolanooka pit will not proceed below the water table. Water from the existing pit will be used for site dust suppression and for watering of the haul roads. No water will be pumped or discharged off site.

Small quantities of low-salinity groundwater occur in overburden, mainly weathered granitic rock, up to about 2 km west of the pit and at other locations along Fallon Road. It appears to have originated from run-off from the Koolanooka Hills and is tapped by several farm windmills. While the salinity of 1,100 mg/L TDS is favourable, the available quantity is probably inadequate for the Midwest operation.

Approximately 250 kL/day of water will be obtained from local bores and the bottom of the existing pit and to be used for dust control in the DSO Mining Project.

4.6.2 Blue Hills

The BIF strata in the main Midwest tenements at Blue Hills show broad folds additional to the tight along-strike folds common in many BIF-metasediment belts. At Mungada pit the strata dip and plunge into the escarpment, therefore bores would need to be located on cross-cutting faults or down-dip of the escarpment, i.e. on relatively high ground. It is expected that two or more bores at Blue Hills tenements would yield 500 to 1,000 m³/d total, although subsurface geological information has not yet been examined.

Should dust-suppression water be required in the Blue Hills area, test-drilling would be undertaken in the vicinity of Mungada pit and Mungada West pit to intersect BIF or adjoining strata along structural features such as faults. Two sites have been selected from the data to hand. Their positions might be adjusted when additional geological data becomes available.

This proposal does not include pit depth extensions below the water table for East and West Mungada and if mining is proposed below the water table this will be applied for as an amendment at a later date.

4.7 VEGETATION AND FLORA OVERVIEW

All ecologia site surveying was completed during early spring 2006 so as to survey during the period of the year where it is easiest to classify most species, due to the presence of inflorescence and to supplement previously completed surveys which were not undertaken during Spring.

4.7.1 Koolanooka

The Koolanooka study area is located within the Avon-Wheatbelt Bioregion (Thackaway and Cresswell, 1995), in relatively close proximity to the intersection of the South-Western and Eremaean Botanical Provinces of Western Australia. The study area is also situated within the Perenjori Botanical District (Beard, 1976). The study area is located within one of several vegetation systems associated with the Perenjori Botanical District, known as the Koolanooka System (Beard, 1976). This Koolanooka Vegetation System is naturally restricted to the two known existing occurrences at Koolanooka Hills and the nearby Perenjori Hills (south east of Koolanooka Hills) (CALM, 2003). The proposed mining area was cleared by Western Mining in the 1960's. The proposed new activities will be occurring in areas of recent regrowth. However the DSO Mining Project will impact on a total of 2.4ha of vegetation immediately abutting the existing pit, which is a part of the Koolanooka System Threatened Ecological Community.

The vegetation associated with the Koolanooka System is described as consisting of an Open Woodland of *Allocasuarina huegeliana*, *Eucalyptus ebbanoensis subsp. ebbanoensis*, *Acacia sp.* scrub with *Dodonaea inaequifolia* interspersed with thickets of *Allocasuarina campestris*, *Acacia acuminata*, *Grevillea stenostachya*, *Melaleuca cordata*, *Melaleuca nematophylla* and *Melaleuca radula*. York Gum (*Eucalyptus loxophleba*) Woodland interspersed with *Melaleuca sp.* scrub is prominent on the footslopes, while mixed *Acacia* spp. (*A. tetragonophylla*, *A. quadrimarginea* and *A. ramulosa*) scrub is supported on granite outcrops of the Koolanooka Hills (Beard, 1976).

A vegetation and flora survey of the Midwest lease area in the Koolanooka Hills was undertaken between 10 and 17 October 2003 (8 days in total) (Bennett Environmental Consulting, 2003). The flora and vegetation survey was conducted using the *EPA Guidance Statement No. 51: Guidance for the Assessment of Environmental Factors: Terrestrial flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2003) as a guide and the survey methodology produced quadrat based quantitative data.

A total of 220 taxa belonging to 117 genera and 43 families were recorded from the Koolanooka Hills study area. This included 207 native and 13 introduced or non-endemic species. The dominant families were Asteraceae (Daisy family – 26 taxa), Mimosaceae (Acacia family – 21 taxa), Myrtaceae (Eucalyptus family – 21 taxa) and Poaceae (Grass family – 19 taxa). These four dominant families represented approximately 39% of the total number of taxa recorded from the study area.

The prominent weed Ruby Dock (*Acetosa vesicaria*), is known to be present in the Midwest lease area in the Koolanooka Hills locality.

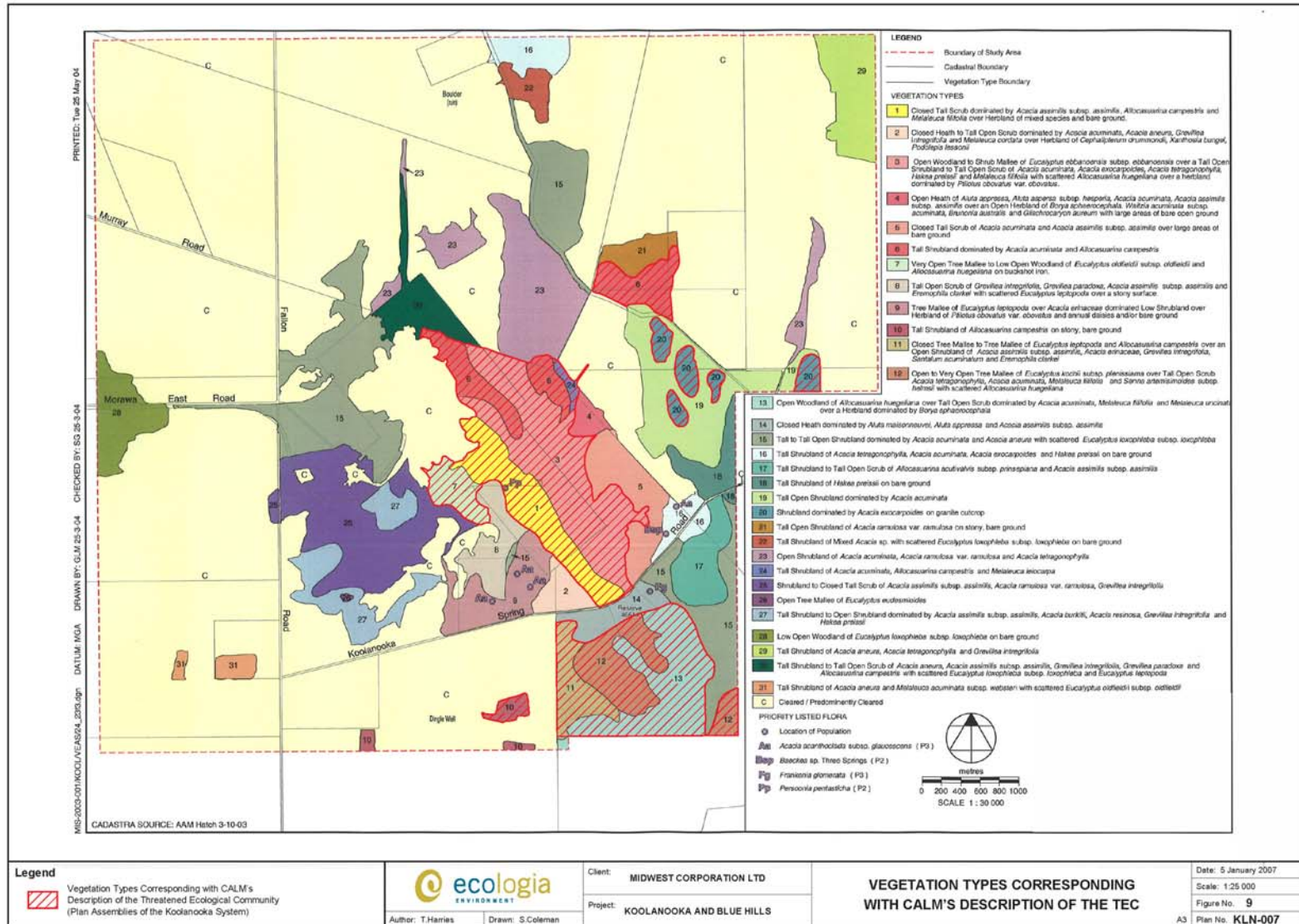
Significant Flora

Six species of conservation significance were recorded from within the Midwest mining leases during the 2003 vegetation and flora survey:- *Acacia acanthoclada* subsp. *glaucescens* (P3), *Persoonia pentasticha* (P2), *Frankenia glomerata* (P3) and *Baeckea* sp. Three Springs (P2), *Eremophila viscida* (R) and *Persoonia pentasticha* (P3) (Figure 10). Based on current data, no species of conservation significance will be impacted on by the mining associated with the DSO Mining Project.

Vegetation Types

A total of 31 different vegetation types were identified during the October 2003 vegetation and flora survey of the Midwest lease areas in the Koolanooka Hills (Bennett Environmental Consulting, 2003). An additional 20 vegetation types were identified during a vegetation survey of Midwest's lease areas in the Koolanooka Hills in March 2004 (ATA, 2004).

The vegetation types of the Midwest lease area and the Koolanooka Hills is shown in Figure 9.



Threatened Ecological Communities

Plant assemblages of the Koolanooka System were assessed by the WA Threatened Ecological Communities Scientific Committee in October 1999 as Vulnerable. This assessment was endorsed by the Minister for Environment in November 2001. The Koolanooka System TEC is described by CALM as *Allocasuarina campestris* scrub over red loam on hill slopes; shrubs and emergent *mallees* on shallow red loam over massive ironstone on steep rocky slopes; *Eucalyptus ebbanoensis* subsp. *ebbanoensis* mallee and *Acacia* sp. scrub with scattered *Allocasuarina huegeliana* over red loam and ironstone on the upper slopes and summits; *Eucalyptus loxophleba* woodland over scrub on the footslopes; and mixed *Acacia* sp. scrub on granite. The total area of the Koolanooka TEC is some 5419ha, and comprises two main occurrences divided into North and South sections by the Koolanooka Springs road.

The description of the Koolanooka System TEC provided by Western Australian Threatened Species Unit (WATSCU) is based on the description of Beard's Koolanooka Vegetation System (Beard, 1976) and corresponds with the mapping shown in Figure 9.

Ecologia has conducted quadrat sampling of the TEC impact area over a full day, and the results of the composition of this location will be discussed in the PER. Lists of flora of conservation significance within the vicinity of the proposed development will be discussed in the PER, including declared rare flora, priority flora, undescribed and range restricted flora.

In addition, a desktop study a 'Species Impact Table' and a "Vegetation Type Impact Table" will be developed outlining the number and percentage of the local and total known populations of significant flora to be impacted as a result of the development.

4.7.2 Blue Hills

The Blue Hills minesite occurs on the boundary between the Austin Botanical District of the Eremaean and the Avon Botanical District of the Southwest Botanical Provinces (Beard, 1990).

A vegetation survey was undertaken by Bennett Environmental Consulting between 20th and 24th October 2003 (Bennett, 2004).

A total of 53 vascular families, 126 genera and 211 taxa were recorded during the survey. This included 94 native and 7 introduced or non-endemic taxa. The dominant families were Asteraceae, Mimosaceae, Poaceae, Chenopodiaceae and Myrtaceae. These four dominant families represented 39% of all genera and 48% of the total number of taxa recorded from the site. The vegetation types of the Blue Hills are shown in Figure 10.

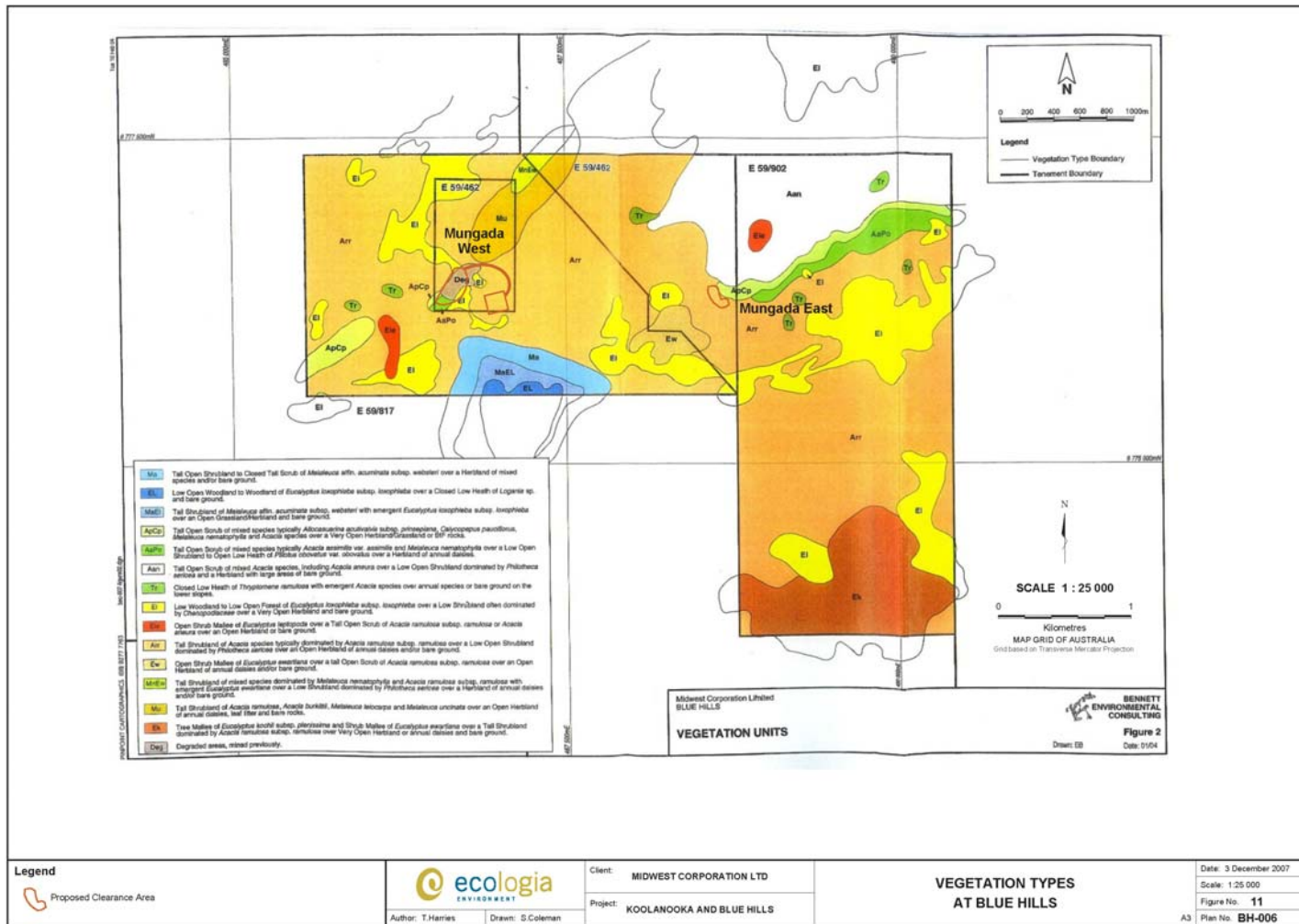
The weed Paterson's Curse *Echium plantagineum*, is known to be present in the Midwest lease area in the Blue Hills locality.

Significant Flora

Two species of conservation significance were recorded:- *Persoonia pentasticha* (P2) and *Cryptandra imbricata* (P3) and possibly a third one; *Stenanthemum poicilum* (P3) from within the Blue Hills survey area. Flowering collections of the plant identified as *Stenanthemum poicilum* need to be collected to confirm its identity.

Vegetation Types

A total of 14 different vegetation types were identified during the October 2003 vegetation and flora survey of the Midwest lease areas in the Blue Hills (Bennett Environmental Consulting, 2004).



* Note that E59/462 has now been converted to M59/595, and E59/902 has been converted to M59/596, these are identical in location; refer to Table 1.1 and Figures 4a & 4b for more information.

4.7.3 Mt Karara / Mungada Haul Road

The Mt Karara/Mungada Haul Road survey area is situated in the Yalgoo sub-region of the Austin Botanical District, within the Murchison Botanical Region. The Yalgoo sub-region is distinctive as it is a transitional area between the Mulga areas and the south-west region and is dominated by a variety of *Acacia* species.

A flora and vegetation survey of the Mungada Haul Road survey area was undertaken by Woodman Environmental Consulting in October 2005 (Woodman Environmental Consulting, 2006), with the eastern-most nine kilometres having been originally surveyed in June 2004.

A total of 206 vascular plant taxa, including 7 introduced taxa, were recorded within the survey area.

Significant Flora

A total of three Priority flora species were recorded:- *Melaleuca barlowii* (P1), *Stenanthemum poecilum* (P2) and *Persoonia pentasticha* (P2).

No Declared Rare Flora species were recorded within the survey area during this survey.

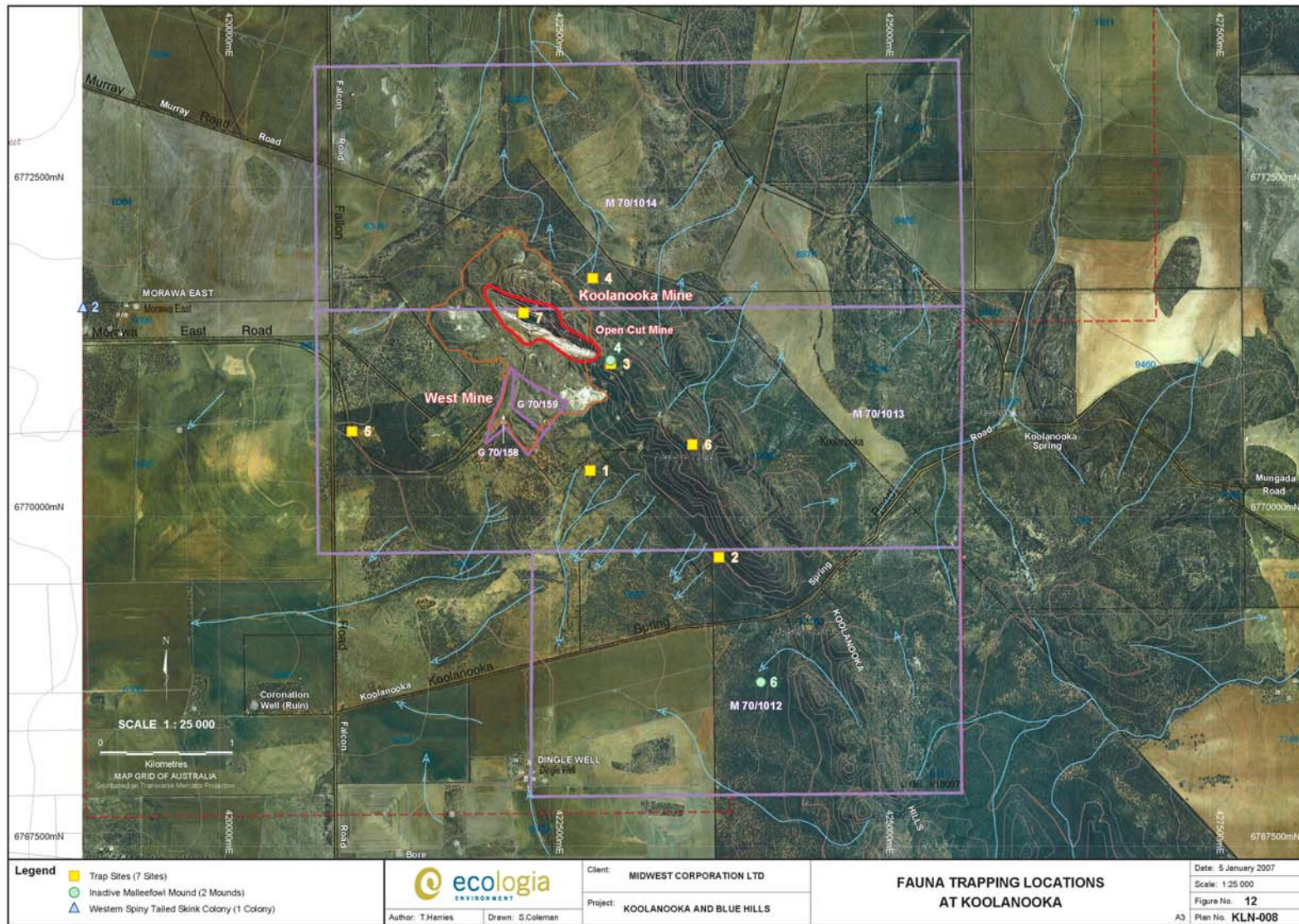
4.8 FAUNA

4.8.1 Koolanooka

Two vertebrate fauna surveys have been undertaken in the Koolanooka area. The first survey was undertaken in June 1996 (Alan Tingay & Associates, 1996) and was reported in the 1996 Koolanooka NOI, (subsequently withdrawn). The second survey was undertaken in December 2003 by ATA Environmental (ATA Environmental, 2004). In each survey a range of vertebrate habitats were surveyed. Some of the fauna habitats have been modified and some areas have experienced a loss of flora diversity due to grazing by rabbits and feral goats, previous mining activities, road construction and clearing for agriculture.

The results of the two fauna surveys were similar and suggest that the area has relatively low species diversity. A total of 77 vertebrate species were identified during the 1996 survey, comprising 12 mammal (5 introduced), 54 bird, 10 reptile and 1 amphibian species. A greater number of species was recorded during the 2003 survey, with 95 species identified comprising 12 mammals (6 introduced), 57 birds (1 introduced) and 25 reptile species. The increased number of reptiles identified in the 2003 survey is attributed to greater activity of reptiles in summer, compared to surveys undertaken in winter when reptiles have reduced activity and are less likely to be detected. The locations of fauna trapping sites, inactive Malleefowl mounds (being environmentally significant) and Western Spiny Tailed Skink colonies are illustrated in Figure 11. The Malleefowl (*Leipoa ocellata*) is listed as Schedule 1 under the *Wildlife Conservation Act 1950* and as vulnerable under the *EPBC Act 1999*.

The above figures will be combined by ecologia to give an indication of total species richness in the PER.



4.8.2 Conservation Significant Fauna at Koolanooka

Two species of conservation significance were discovered during the 2003 fauna survey. The Western Spiny-tailed Skink (*Egernia stokesii badia*) is listed as Schedule 1 under the *Wildlife Conservation Act 1950* and as endangered under the EPBC Act. The Malleefowl (*Leipoa ocellata*) is also listed as Schedule 1 under the *Wildlife Conservation Act 1950* and as vulnerable under the *EPBC Act* (See Table 4.1).

TABLE 4.1 FAUNA OF CONSERVATION SIGNIFICANCE - KOOLANOOKA

	<i>Wildlife Conservation Act 1950</i>	<i>EPBC Act</i>
Western Spiny-tailed Skink	Schedule 1	Endangered
Malleefowl	Schedule 1	Vulnerable

Western Spiny-tailed Skink

Two colonies of the Western Spiny-tailed Skink were found during the 2003 survey. One colony was located within the study area within a large hollow of a Eucalypt tree underneath tin sheeting. The other colony was located just outside the study area.

Habitat utilized by this species consists of rock crevices and hollow timber (Wilson, 2003). Rubbish tips and old woodpiles also provide common suitable habitat. According to the 2003 survey it is unlikely that more colonies are in the study area due to limited suitable habitat. All tip sites and car dumps were searched. A reference to the current condition and status of this species regionally will be provided in the PER for this project.

The Western Spiny-tailed skink occurs in two apparently disjunct populations, the Central Wheatbelt and the Central Carnarvon Basin. Populations at both locations are thought to be in decline. Only two localities are known in the Central Carnarvon Basin with the most recent sighting occurring in 1996 by Brad Maryan. A survey of known and potential sites was undertaken in the Central Wheatbelt in 1998. Evidence of several extant populations was found.

Malleefowl

Six inactive Malleefowl mounds were located within the Koolanooka study area of the 2003 survey. These mounds were inactive and were the only evidence of Malleefowl being present within the study area. Malleefowl exist in dry inland scrub and mallee, they prefer scrubland with sandy soil which allows easier building of nests.

This species has undergone a massive decline in the past 100 years due to clearing and introduced predators and competitors. The original distribution of these species was most of the southern half of the Australian continent. Now it has constricted to patches in WA, SA, ACT, Victoria and NSW. Large scale clearing removed most of the best habitat of the

species, this clearing has fragmented the distribution of Malleefowl, and over much of its current range the species now persists in small patches of habitat that are inadequate for its long-term conservation (Benshemesh, 2000).

Despite some indepth studies of this species there is insufficient information available to accurately assess the conservation status of Malleefowl across Australia except in broad terms (Benshemesh, 2000). Therefore the discovery of inactive mounds in the study area is of environmental significance, however no live individuals were found. It is estimated that these mounds are well over 10 years of age however male Malleefowl have been known to return and re-use inactive mounds (R. Johnstone, Western Australian Museum, pers. comm. 2004).

4.8.3 Blue Hills

A fauna survey of the Blue Hills area was undertaken by Bamford Consulting Ecologists in February 2004 (Bamford, 2004). A total of 55 vertebrate species were identified during the 1996 survey, comprising nil mammals, 33 birds, 21 reptiles and 1 amphibian species. Bamford Consulting Ecologists note that Blue Hills supports a depauperate vertebrate fauna assemblage. This is partly due to the historical loss of mammals and perhaps the seasonal absence of some birds, but low rainfall over the previous several years was probably a contributing factor.

It is understood that this study by Bamford Consulting Ecologists is not representative in itself of the fauna of the Blue Hills region, due to it being conducted in February, which will limit the active presence of some fauna types. However, this report will be supplemented with further information to be summarised in a desktop study provided in the PER, which will ensure that the dual surveying requirement of the DEC's Guidance Statement 56 will have been satisfied. The proponent would also like to note that the vegetative disturbance required in this area is expected to be of minimal risk to species of conservation significance, as all of the vegetation to be cleared alongside this haul road is of roadside verge regrowth only.

The Blue Hills provides a rich range of habitat for vertebrate fauna and while the Narrow-leaf Mulga on loam soil appeared to be the richest in reptiles, all habitats can be considered to be important in this area, due to numbers of individuals observed.

Three species of conservation significance were found within the study area by Bamford Consulting Ecologists. Gilled Slender Blue Tongue (*Cyclodomorphus branchialis*) is listed as Schedule 1 under the Wildlife Conservation Act. The White Browed Babbler (Western Wheatbelt) (*Pomatostomus superciliosus ashbyi*) and the Crested Bellbird (southern) (*Oreoica gutturalis gutturalis*) are both ranked as priority 4 by the DEC.

4.8.4 Conservation Significant Fauna at Blue Hills

Gilled Slender Blue Tongue (*Cyclodomorphus branchialis*)

The distribution of this species is from the Midwest coast from the Murchison River in the north to the Irwin River in the south and inland to the vicinity of Yalgoo. It is endemic to

Western Australia. Within the study area this species was located on rocky ridges and the slopes of rocky ridges (Bamford, et, all, 2004).

White Browed Babbler (Western Wheatbelt) (*Pomatostomus superciliosus*)

Spotted within the study area in low woodland of Melaleuca with some scattered small Eucalypts. Past range was south-western Western Australia, but not in or west of the Darling Range where it intergrades with *P. s. superciliosus* between Dongara-Geraldton and Hopetoun-Esperance (Schodde and Mason, 1999). This species distribution presently is much reduced (Saunders and Ingram, 1995).

Crested Bellbird (*Oreoica gutturalis gutturalis*)

Clearing presents the main threat to this species. Of what fragments of habitat remain, degradation is occurring by stock and weeds although this species has proven more resilient than many birds (Saunders and Ingram, 1995). According to Reid (1999) declines and regional extinctions seem inevitable in all but the largest patches.

4.8.5 Mt Karara/Mungada Haul Road

A fauna survey of the Mt Karara/Mungada Haul Road was undertaken by Bamford Consulting Ecologists in 2004 (Bamford, et, all, 2004).

The Malleefowl (*Leipoa ocellata*), listed as significant under the Commonwealth's *EPBC Act* and the Western Australian *Wildlife Conservation Act* was not observed to be present in this location during this survey.

4.8.6 Invertebrates

Short range endemic fauna are anticipated to carry low potential impact from implementation of this project as discussed with the WA Museum (Dr Mark Harvey, pers com 2006) and UWA (Barbara Main, pers com 2006) and as further discussed in section 5.2.4 of this scoping document. A project risk assessment will be conducted on impact on SREs at both Koolanooka and Blue Hills and included in the PER.

Stygofauna will likely be a minimal issue on this project as there will be no new pit dewatering. None of the three new pit extensions will proceed below the water table and although the Koolanooka pit waters will be utilised for dust suppression, this activity is currently occurring within the existing Stockpile of Fines project. It is also Midwest's intention to date to use only pre-existing bores for water supply and hence provide low potential impact. However if new bores are installed for use on this project, and the water quality and salinity is conducive to supporting stygofauna populations, then Midwest will conduct stygofauna sampling on these bores prior to operation in order to determine the level of risk to stygofauna communities generated by this activity.

Regarding troglofauna, it is the position of Midwest that as there are no cavities open to the surface in the proposal impact area, and only minimal cavities have been encountered during test drilling, it is extremely unlikely that impacts to troglofauna will be significant on

this project. This will be supported by a risk assessment conducted on impacts to troglofauna in this region. This assessment will be provided in the PER.

4.9 SOCIAL AND CULTURAL ENVIRONMENT

4.9.1 Koolanooka

Koolanooka Iron Ore Mine produced the first commercial export of iron ore from Western Australia and had a significant socio-economic impact on the town of Morawa during the 1960s. The mine is listed in the Morawa Heritage Inventory, with the recommendation that, should the mine ever be re-opened, the site would be photographed prior to the commencement of earthworks. This requirement has already been fulfilled by Midwest. The existing Koolanooka mine site has been used as an informal lookout and picnic area for the general public. This lookout will likely remain open over the duration of the mining works, and this will be confirmed in the PER. Additionally Midwest commit to leaving a “historic mining trail” of previous workings of the mine, for future tourism ventures. There are no other known sites of European significance on or near the mine site.

Two residences are located in relatively close proximity to the Koolanooka mine. The first residence is located approximately 5 km to the south of the mining operations. The second residence is located on Munckton Road 3 km to the northwest of mining operations and is leased to Midwest.

There are two native title claims covering the area, which are the Widi Mob (unregistered) WAG6193/98 (WA97/072) and the Pandawn (unregistered) WAG0043/98 (WC96/083). Midwest has consulted the Native Title Claimants and is determined to maintain a good working relationship with affected aboriginal groups who have no objection to the continuation of mining activities.

A third claimant group potentially has an interest in this area, the Amungu mob WC04/2. Details of this group and any necessary considerations will be provided in the PER for this proposal.

Two previously recorded sites of Aboriginal heritage significance are located within the Koolanooka Hills as determined by ethnographic and archaeological studies (O'Connor, 1996, Quatermaine, 1996). The extent of these sites has been poorly defined and do not include the full extent of the Koolanooka Hills. The register relating to Site 5868 (open) indicates a man made structure and attributes of ceremonial and mythological significance. Site 4496 is a closed site with written permission required to access details relating to the site. Approval to disturb the two registered sites has been obtained under Section 18 of the *Aboriginal Heritage Act 1972*. Evidence of the Section 18 clearances will be provided in the PER.

An additional site was identified in a heritage study undertaken in 2003 (Hames Consultancy Group, 2003). The additional site is a rock shelter in the saddle of the two main hills, containing two artefacts and potential sub surface deposits. Additionally the

assessment found that as the area had been previously severely degraded by previous mining activities the local Aboriginal groups had no objection to mining operations taking place.

4.9.2 Blue Hills

In June 2005, Midwest Corporation Ltd commissioned Western Heritage Research Pty Ltd archaeologist Wayne Glendenning to conduct an archaeological survey of the Morawa Rail Siding and Blue Hills haul road. The archaeological survey was undertaken in July 2005 (Western Heritage Research, 2005).

The areas inspected included the Blue Hills haul road from approximately 488694E; 6776370N to approximately 488480E; 6776000N; the Morawa Siding project from approximately 403759E; 6771509N to approximately 420859E; 6771309N; and a 500 metres area surrounding the existing mine at Blue Hills.

The archaeological survey found no new archaeological sites.. However, three previously recorded sites were inspected: Blue Hills Larger Cave (site ID 20857); Blue Hills Smaller Cave (site ID 20858) and Granite Pavement with rockhole (site ID 20860).

The two cave sites are located near the existing mine at Blue Hills, whereas the site Granite Pavement with rockhole is located adjacent the proposed Blue Hills haul road at 474185E; 6772394N.

The heritage sites discussed above are present within the following tenement locations: M59/595, M59/596 and L59/62.

4.9.3 Mt Karara/Mungada Haul Road

This haul road was also assessed as part of the archaeological survey undertaken in July 2005 by Western Heritage Research. No new archaeological sites were located, however the three previously recorded sites were inspected as previously discussed in Section 4.9.2.

4.10 SUSTAINABILITY

The Western Australian Government has released a Sustainability Strategy for Western Australia: *Hope for the Future: the Western Australian State Sustainability Strategy* (Government of Western Australia, 2003). The strategy includes a vision for the State's mining industry and some key future actions are:

- 1) work towards assessment of projects using sustainability criteria;
- 2) foster local community involvement (particularly Aboriginal communities, pastoralists and local shires);

- 3) establish a transparent process to enable community awareness of the day-to-day regulatory system for the resources industry; and
- 4) implement strategies that support the use of local employment in mining ventures, particularly using regional centres as employment hubs and encourage mining companies to maximise their purchasing of goods and services within regions.

Following changes to the *Environmental Protection Act 1986*, the EPA now requires all formal environmental impact assessments to address the principles of sustainability. The application of the principles of sustainability to the Koolanooka/Blue Hills DSO Mining Project is summarised in Table 1.4.

While the Koolanooka/Blue Hills DSO Mining Project involves the mining of a finite resource and the use of fuel resources that may one day be depleted, the project will be planned, constructed, operated and decommissioned in a manner that meets the principles of sustainability. Midwest, in managing impacts across the quadruple bottom line of Social Capital, Economic Wealth, Environmental Assets and Corporate Governance, will address sustainability principles in a number of ways including:

- establishing sustainability principles in purchasing and contracting;
- ensuring efficient energy and water use;
- minimising waste and encouraging recycling; and
- providing for industry and community partnerships.

Management commitments in relation to these principles will be clarified within the PER, and its associated EMS and Conceptual Closure Plan.

5.0 POTENTIAL ENVIRONMENTAL IMPACTS, THEIR SIGNIFICANCE AND PROPOSED ADDITIONAL STUDIES

The following environmental issues are considered relevant to the proposed Koolanooka/Blue Hills DSO Mining Project. For each issue, the management objectives, applicable standards / guidelines, potential impacts, proposed surveys and investigations and site management required are detailed:

Biophysical

- Vegetation and Flora.
- Fauna.
- Surface and Groundwater Hydrology.

Pollution Management

- Mine Planning, Decommissioning and Rehabilitation.
- Dust & Particulates.
- Greenhouse Gas Emissions.
- Noise and Vibration.
- Waste Rock.
- Solid, Hazardous & Liquid Wastes.

Social Surroundings

- Aboriginal Heritage and Social Environment.
- Visual Amenity, Landform & Geo-conservation.

Integration

- Sustainability.
- Offsets.

Preliminary management measures that are proposed to minimise the potential impacts of the proposal are summarised in the Environmental Management Summary (Table 5.1) and in the following sections. These measures will be reviewed as further environmental investigations of the study area are undertaken and upon development of the PER.

5.1 VEGETATION AND FLORA

Cutback to the pits and small areas of infrastructure will require vegetataion clearance. As far as possible infrastructure will be placed on previously cleared/used areas.

Two areas of conservation sensitivity are acknowledged within the proposed project area, the CALM managed Karara conservation area at Blue Hills and the TEC bordering the Koolanooka mine pit. It is appreciated that incremental pressures on local vegetative communities form a significant concern and as such all proposed vegetative clearance associated with this project has been minimised.

5.1.1 Management Objectives

The objectives for the management of flora and vegetation are to:

- Maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge;
- Minimise the loss of and adverse impacts to native vegetation and plant habitats; and
- Protect Rare and Priority Flora species that occur within the proposal area.

5.1.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- EPA Position Statement No. 2 Environmental Protection of Native Vegetation in WA (EPA, 2000);
- EPA Position Statement No. 3. Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA, 2002);
- EPA Position Statement No. 9 Environmental Offsets (EPA, 2006);
- EPA Guidance Statement No. 51. Terrestrial Flora and Vegetation Surveys Environmental Impact Assessment in WA (EPA, 2004);
- EPA Guidance Statement No. 3. Separation Distances between Industrial and Sensitive Land Uses (EPA, 2005); and
- CALM Policy Statement No 9, Conserving Threatened Species and Ecological Communities (CALM, 1999).

5.1.3 Potential Impacts

Koolanooka

The development of the DSO Mining Project will result in the clearing of 2.4 ha of vegetation immediately abutting the existing Koolanooka pit. No clearing will be required for the waste dumps, processing area, temporary offices, workshop and ablutions. The vegetation type to be cleared for the extension of the existing open cut pit is Closed Tall

Scrub dominated by *Acacia assimilis subsp. assimilis*, *Allocasuarina campestris* and *Melaleuca filifolia* over Herbland of mixed species and bare ground. This vegetation type is one of the vegetation types comprising the Koolanooka System TEC, which has been classified as vulnerable by the WA Threatened Ecological Communities Scientific Committee. This vegetation system is naturally restricted to the two known existing occurrences at Koolanooka Hills and the nearby Perenjori Hills, south east of Koolanooka Hills (CALM, 2003).

Previous exploration activities have resulted in parts of the Koolanooka TEC being disturbed. 6.26 ha of disturbed land currently exists within the Koolanooka TEC on Midwest tenements. Cumulative impacts of the proposed Project on the TEC at Koolanooka will be further discussed in the PER.

No species of conservation significance are anticipated to be impacted on by the mining associated with the DSO Mining Project (Figure 9).

Ruby Dock (*Acetosa vesicaria*), is an extensive weed problem in the area. The development of the DSO mining project has the potential to exacerbate the current condition and spread the infestation to other areas.

Blue Hills

Two species of conservation significance were definitely recorded:- *Persoonia pentasticha* (P2) and *Cryptandra imbricata* (P3) and possibly a third one: - *Stenanthemum poecilum* (P3) from within the Blue Hills survey area during the Bennett Environmental Consulting 2003 vegetation and flora survey. Flowering collections of the plant identified as *Stenanthemum poecilum* need to be collected to confirm its identity. A flora survey will determine the presence of these species within the Blue Hills impact area.

Transportation of the Ore

Clearing of regrowth along both sides of the haul road from Mungada to Koolanooka is required to facilitate road trains and general mining traffic. The potential clearing is estimated at 33 ha (55 km x 3 m each side of the road).

Cumulative Impacts

Midwest is aware of other proposed mining operations which if approved will be developed in close proximity to the Midwest operations in the Blue Hills area. As such the PER for the Midwest DSO mining project will discuss the expected cumulative impacts of all the proposals within the Blue Hills area. Particular attention will be given to the cumulative impacts on priority flora species, especially in relation to impacts to the species *Acacia sp.* Blue Hills Range R.J. (Cranfield 8582) (P1) and *Lepidosperma sp.* Karara BIF (A. Markey & S. Dillon) (P1).

5.1.4 Surveys and Investigations

Koolanooka Minesite

A desktop assessment based on information from the Western Australian Threatened Species and Communities Unit (WATSCU) will be undertaken to determine the significance of the impact on vegetation and TEC at a regional scale.

Quantitative footprint studies are to be undertaken on the TEC area of impact at Koolanooka and the results of this survey will be discussed in the PER.

Midwest will liaise with the DEC to discuss an appropriate offset for the proposed impact on the Koolanooka System TEC.

The details of the result of all these activities will be discussed in the PER.

Blue Hills Minesite

A detailed survey of the 4.5 ha impact footprint will be undertaken to assess for the presence of rare or priority flora and this will be discussed in the PER.

Transportation of Ore

A Mining Proposal based study has commenced on the proposed Tilley siding rail loading facility near Morawa. Ore will be transported to this facility by road train along Munckton road, which is already being used for transport of ore under the Stockpile of Fines Project. A General Purpose Leases exists or are under application for ore handling and transfer to rail at Tilley Siding.

5.1.5 Management

Vegetation Clearing

- Although initial mine plans only include clearing in mine pit expansion areas, careful mine site planning may allow for avoidance, minimization and / or offset impacts from required clearing of flora and vegetation, including impacts to flora of conservation interest.
- Midwest is committed to addressing the key principals of native vegetation protection as listed in Schedule 5 of the *Environmental Protection Act 1986*. This will be addressed as part of Flora surveys and in the project EMS and EMP.
- Topsoil and vegetation from all clearance activity will be separately stockpiled in dedicated stockpile areas with controlled clearance practices concerning soil removal and stockpiling in place and to be further described in the PER.
- Weed dispersal will be controlled via establishment of weed hygiene procedures, and with staff being trained on the presence of established weeds within the DSO project areas and within the local area. Management of weeds will be discussed further in the PER for this proposal.
- Mapping of weed locations and extents on and adjacent to areas of impact related to the Project will be undertaken prior to initial disturbance and at intervals

throughout the life of the project and at closure. Weeds will be controlled within the project area by physical removal and spot spraying,

- Wildfire from accidental ignition will be avoided as far as possible.

Rare and Priority Flora

Midwest will comply with the requirements of the *Wildlife Conservation Act 1950* and *Environment Protection and Biodiversity Conservation Act 1999* by undertaking the following:

- Rare Flora baseline surveys will be conducted for all disturbance areas and locations of any Declared Rare and Priority Flora taxa will be incorporated into an Environmental Geographical Information System (GIS) and plotted onto maps;
- Avoid impact to species of Declared Rare and Priority flora or Conservation Significance by using information from flora surveys conducted in the area;
- Implement measures to limit the extent of vegetation clearing, e.g. marking clearing limits;
- Consistent with existing vegetation management procedures, areas will be re-surveyed if information from the existing surveys does not provide sufficient information about the location of such species;
- Liaise with DEC regarding the management of Rare, Priority and Significant Flora; and
- Where appropriate Midwest will prepare and implement a Threatened Flora Management and Conservation Plan for the Project to address management of Threatened Flora impacted by the proposed development.

Weeds

Weed dispersal will be controlled via establishment of weed hygiene procedures, and with staff being trained on the presence of established weeds within the DSO project areas and within the local area. Management of weeds will be discussed further in the PER for this proposal.

Paterson's Curse (*Echium plantagineum*) has been found to be present in the Blue Hills locality and management considerations will be provided within the EMP for this project to limit potential impacts and spread of this weed.

Ruby Dock (*Acetosa vesicaria*) is a significant problem in the works area. Any weed populations discovered during floristic surveying on project areas by ecologia will be discussed and addressed in the PER.

If generated by works activities:

- Ruby Dock and Paterson's Curse plants will have a suitable glyphosphate herbicide, eg Roundup, applied; and
- If needed, the appropriate herbicide will be applied once Ruby Dock and Paterson's Curse is in full foliage and actively growing, and before it sets seed.

5.2 FAUNA

5.2.1 Management Objectives

The objectives for management of terrestrial fauna are to:

- Maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge; and
- Minimise the impact to fauna.

5.2.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- EPA Guidance Statement No. 56. Terrestrial Fauna Surveys for Environmental Impact Assessment in WA (EPA, 2004); and
- EPA Position Statement No. 3. Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA, 2002).

5.2.3 Potential Impacts

Koolanooka Minesite

Ninety five species of vertebrate fauna were identified during the 2003 fauna survey comprising 12 mammals (6 introduced), 57 birds (1 introduced) and 25 reptile species. A number of species of vertebrate fauna with conservation significance have been recorded from the area; however none will be impacted by the proposed DSO Mining Project.

Malleefowl (*Leipoa ocellata*) has been recorded from the study area in the past. Two Malleefowl mounds were located within the study area during the 2003 fauna survey (Figure 11). However, both mounds were inactive and there was no evidence of Malleefowl being present within the study area during the 2003 fauna survey. One inactive mound will be impacted by the DSO Mining Project. The Malleefowl is listed as a Schedule 1 species under the *Wildlife Conservation Act* and as Vulnerable and a Migratory species under the *Environmental Protection and Biodiversity Conservation Act*. The project will not affect the conservation status or distribution of the species, however the inactive Malleefowl mounds will be considered environmentally significant locations.

One colony of the Western Spiny-tailed Skink (*Egernia stokesii badia*), which is classified as Schedule 1 under the *Wildlife Conservation Act 1950* and as Endangered under the *Environment Protection and Biodiversity Conservation Act, 1999*, was recorded in the proposed project area during the fauna survey in a degraded area with tin and abandoned car bodies surrounding farmhouses. The population will not be impacted by the DSO Mining Project, as it is well removed from the Proposal impact site (Figure 11).

A number of migratory bird species listed under the *Environmental Protection and Biodiversity Conservation Act* were observed in the study area including the Brown Goshawk, Wedge-tailed Eagle, Spotted Harrier, Australian Shelduck, Brown Falcon, Nankeen Kestrel, Tree Martin, Welcome Swallow, and Rainbow Bee-eater. It is unlikely the mining activity will substantially modify, destroy or isolate an area of important habitat of any of these migratory species, or seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of any of the species.

The proposed clearing of 2.4 ha of vegetation for the DSO Mining Project will have a minimal impact on fauna habitat.

Blue Hills Minesite

A fauna survey of the Blue Hills area was undertaken by Bamford Consulting Ecologists in 2004.

A total of 55 vertebrate species were identified during a previous survey (Allan Tingay, *et al.*, 1996), comprising nil mammals, 33 birds, 21 reptiles and 1 amphibian species.

- Many of the bird, reptile and mammal species in the region shelter in crevices or hollows, in shrubs and trees. Dead trees are regarded as valuable habitat and will be protected, and the collection of firewood from the area will be prohibited.
- Caves in the Blue Hills are important for some fauna and contain historically significant nests of stick-nest rats. Access to these caves by project personnel will be controlled.
- Feral animals in the area have adverse impacts on native wildlife, and will not be introduced or encouraged by site related refuse or other activity.

Mt Karara/Mungada Haul Road

The Malleefowl (*Leipoa ocellata*) is listed as a Schedule 1 species under the *Wildlife Conservation Act* and as Vulnerable and a Migratory species under the *Environmental Protection and Biodiversity Conservation Act*. As the fauna survey conducted by Bamford Consulting Ecologists in 2004 indicates, the proposal is not anticipated to affect the conservation status or distribution of this species across this location.

5.2.4 Surveys and Investigations

Koolanooka Minesite

A desktop assessment will be undertaken for the PER to determine the conservation significance of the site for fauna in a regional context.

Following advice from the EPA Services Unit, the need for additional studies to determine potential impacts on short range endemics such as millipedes, spiders and land based snails was discussed with the WA Museum (Dr Mark Harvey, pers com) and UWA (Barbara Main, pers com). In their opinion the impact of the project on short range endemics at Koolanooka was likely to be minimal and thus felt there was a reduced need for surveying in this area. A risk assessment will be conducted on this issue at both Koolanooka and Blue Hills, for release in the PER, to further discuss the risk of project impact to short range endemics.

Subterranean Fauna

Subterranean Fauna may occur in suitable substrate such as limestone strata and paleochannels within the Midwest/Yilgarn area. The Mongers Lake paleochannel system is located several kilometres to the north of Koolanooka Hills (Rockwater, 2004).

Groundwater abstraction for the DSO Mining Project is unlikely to impact subterranean fauna as there will be no impact on substrates prospective for that fauna. Additionally only established bores and pit waters will be utilised for water supply at Koolanooka, waters which are already in use for current operations and as such contain little risk that their use will impact on significant stygofauna populations. Accordingly no additional studies relating to subterranean fauna are proposed at Koolanooka.

Blue Hills Minesite

A desktop assessment will be undertaken for the PER to determine the conservation significance of the site for fauna in a regional context.

Subterranean Fauna

As excavation of both the East and West Mungada pits will not proceed below the water table there will be no dewatering required at these locations. Water for proposal activities will be sourced from established bores where possible, either from agreement with nearby landholders, or gaining approval to rejuvenating old bores within the Karara station locality.

If new bores need to be created to supply project water requirements in this region, and the water quality is such that it is conducive to supporting stygofauna populations, then stygofauna surveys will be conducted at these locations.

Mt Karara/Mungada Haul Road

A desktop assessment will be undertaken for the PER to determine the conservation significance of the site for fauna in a regional context. No further surveys on this area are planned at this stage.

Short Range Endemics

It is anticipated that Short Range Endemic (SRE) fauna potentially carry a low impact from implementation of the Project. This has been discussed with the WA Museum and the University of Western Australia, and indicates a potentially reduced need for surveying (Dr Mark Harvey, pers com 2006 and Barbara Main, pers com 2006 respectively).

A Project risk assessment has been conducted on potential impact on SREs at both Koolanooka and Blue Hills and this indicates there is a risk of impact to SREs, particularly concerning three Schedule 1 species, under the *Wildlife Protection Act 1950*, that may potentially occur in the impact area. These are three trap door spider species known to inhabit the north-eastern agricultural/ Midwest region, *Idiosoma nigrum*, *Aganippe castellum* (Idiopidae) *Kwonkan eboracum* (Nemesiidae).

ecologia Environment surveyed for SREs in early 2007 within the proposal impact areas and are currently awaiting identification of species. The results of these surveys will be discussed within the PER.

Troglofauna

Based on site inspections of the proposed impact areas by zoologists, geologists and environmental scientists, there is no evidence of cavities open to the surface in the proposal impact area, and only minimal cavities have been encountered during test drilling. It is considered extremely unlikely that impacts to troglofauna will be significant on this Project.

In order to confirm the impact areas are devoid of troglofauna of significance, trap baited sampling has commenced on site. The findings of this assessment will be discussed within the PER

5.2.5 Management

- Impacts to fauna from vegetation clearing will be minimised by reducing the clearing footprint where possible and conducting staged clearing. Disturbed areas will be rehabilitated as soon as possible, with ongoing rehabilitation throughout the mine life to facilitate habitat restoration.
- Drill holes will be capped to prevent fauna entrapment and fatalities. Operational control procedures and employee training programs will be implemented to protect native fauna from intentional harm and to appropriately manage injured fauna if found.
- Wildfire from accidental ignition will be avoided as far as possible

- Midwest may look into installing high pitched whistles on the front of road trains working the Blue Hills haul road in an attempt to scare away fauna and reduce fauna death due to use of the road.

Fauna of Conservation Significance

Midwest will comply with the requirements of the *Wildlife Conservation Act 1950* and *Environment Protection and Biodiversity Conservation Act 1999* by undertaking the following:

- Rare fauna baseline surveys will be conducted for all disturbance areas and locations of any fauna of conservation significance will be incorporated into an Environmental Geographical Information System (GIS) and plotted onto maps;
- Endeavour to avoid impact to individuals and habitats of fauna of conservation significance by using information from fauna surveys conducted in the area;
- Measures to limit the extent of vegetation clearing, e.g. marking clearing limits;
- Areas will be re-surveyed if information from the existing surveys does not provide sufficient information about the location of such species;
- Liaise with DEC regarding the management of fauna of conservation significance;
- Implement operational control procedures, site inductions and employee training programs to protect native fauna from intentional harm and to appropriately manage injured fauna if found; and
- Any death of fauna of conservation significance will be reported to DEC.

In addition, to help protect Malleefowl, Midwest will:

- Join the Malleefowl Preservation Society;
- Record sightings of nests both active and inactive; and
- Record sightings of birds in time/number/location.

5.3 SURFACE AND GROUNDWATER HYDROGEOLOGY

5.3.1 Management Objectives

The objectives for management of surface & groundwater are to:

- Control and contain contaminated water on site to prevent entry into the natural drainage system and surrounding vegetation;
- Maintain the quality and quantity of surface & groundwater so that existing and potential environmental values, including ecosystem maintenance, are protected;
- Maintain the integrity, ecological functions and environmental values of “wetlands”; and
- Minimise impacts to surface & groundwater resources during mining.

5.3.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- AS 3500: 1 - 2003 Plumbing and Drainage;
- Australian Drinking Water Guidelines (NHMRC, 2004);
- DoH (Draft) Guidelines for the Use of Recycled Water in Western Australia.
- Australian New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC / ARMCANZ, 2000);
- Environmental Water Provisions for Western Australia; Statewide Policy No. 5 (WRC, 2000); and
- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005).

5.3.3 Potential Impacts

The potential impacts of the DSO Mining Project on surface waters are likely to be minimal. There is the potential for contamination of surface waters resulting from sedimentation, erosion, hydrocarbons and chemical spillage at the minesite. The transportation of ore on existing roads is expected to have negligible impact on surface water flows.

The DSO Mining Project has minimal potential to impact on groundwater quality through spillages of liquid chemicals and diesel and the disposal of various forms of solid and liquid wastes.

During high rainfall events the effect of stormwater discharge from the site may need to be controlled, potentially via a sediment trap system. This possibility will be considered further in the PER.

5.3.4 Surveys and Investigations

- The impact of groundwater extraction on local and regional groundwater will be assessed and detailed in the PER.
- The quality of the water to be used for dust suppression within the mine site and its potential to impact on vegetation will be assessed.

5.3.5 Management

Trigger values and proposed groundwater management strategies for the mine site will be outlined in the PER document. Groundwater monitoring will be used in conjunction with groundwater modelling and trigger values to ensure that the identified groundwater environmental values are preserved where necessary.

Management of hydrocarbon contaminated water and soils will be discussed in the PER for this proposal, detailing response to contamination events and will also discuss management

of ongoing issues through the implementation of appropriate site structures such as washdown bays, remediation facilities and oil water separators.

Mine Pits

Groundwater extraction will be in compliance with a 5C Licence to Take Groundwater (if required) under the *Rights in Water and Irrigation Act 1914*. No process water will be discharged from the mine site and all groundwater required will be utilised for dust suppression activities.

The mine will be designed to ensure the safe storage and handling of hazardous materials (such as hydrocarbons) to prevent offsite contamination, and the construction and operation EMP will be developed to minimise the risk of spills and contamination to groundwater.

Landfill and overburden stockpiles will be constructed with sufficient surface to groundwater table distance (with considerations to hydroconductivity of the geology) to minimise the potential for groundwater contamination. Use of physical barriers such as clay or artificial liners will be used to prevent contamination where required.

Approval from the DEC will be obtained prior to undertaking any works at river crossings. Traditional custodians will also be consulted prior to project works where appropriate.

5.4 MINE PLANNING, DECOMMISSIONING AND REHABILITATION

5.4.1 Management Objectives

The objectives for decommissioning and rehabilitation are to:

- Ensure that rehabilitation achieves a long term safe, stable and functioning landform which is consistent with the surrounding landscape and other environmental values; and
- Fulfil commitments made to stakeholders and regulators regarding closure outcomes.

5.4.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- AMEC - AMEC Mine closure Guidelines (AMEC, 2000);
- Strategic Framework for Mine Closure (ANZMECC, 2000);
- Mine Closure Guideline for Minerals Operations in WA. (DoIR ,2000); and
- Mine Void Water Issues in WA (WRC, 2003).
- Guidance Statement No 6: Rehabilitation of Terrestrial Ecosystems (EPA, 2006)

The PER will also adhere to commitments made within the proposal EMP and Conceptual Closure Plan.

5.4.3 Potential Impacts

The DSO Mining Project impacts two locations, Koolanooka and Blue Hills.

At Koolanooka ore will be excavated from areas that have already been disturbed or partially mined but which are external to the existing pit. The South Fold Orebody will be excavated from a cut back to the immediate south-southeast of the old pit with ore being transported to the plant site via a combination of existing and new haul roads. The remnant and pisolite ores will be accessed from existing mining benches on the western wall of the pit without having to establish new mine benches. The Blue Hills the East and West Mungada pits will be brought back into operation and will be connected to Koolanooka through re-instating the Mt Karara / Mungada Haul road.

5.4.4 Surveys and Investigations

A Conceptual Closure Plan will be developed and made available for review with the PER document.

The Conceptual Closure Plan will detail ultimate land use, rehabilitation objectives and completion criteria to ensure no significant environmental impacts remain after closure. This plan will be written in accordance with AMEC and ANZECC guidelines as well as the EPA's Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (2006).

5.4.5 Management

Decommissioning will comprise the safe dismantling and removal of infrastructure, the appropriate disposal of waste materials and the impacted areas returned to an array of vegetation types and fauna habitats that reflect the pre-disturbance state as closely as possible. Where the removal of non-visible infrastructure, or features that have been incorporated into the natural landscape may cause more environmental damage than if left in situ, then their retention will be discussed with the relevant authorities at the time.

Formation of waste rock stockpiles will be done progressively over the project's duration, taking into account desirable final landform and rehabilitation requirements. Waste dumps from previous mining will also be amended, where feasible, for this purpose. Specifically the Northern Waste dump alongside the public access road will be reshaped, have erosion issues addressed, and be rehabilitated with the proviso that this does not require a clearing permit, will require no different plants or materials than will new waste dumps, and the result is not inconsistent with planned final land use.

Rehabilitation will occur progressively where possible as disturbed areas are no longer utilised. Should Midwest not undertake further operations upon the completion of mining, all sites impacted by the project will be rehabilitated. Rehabilitation activities will include;

- Re-establishment of stable landform with erosion protection for long term stability;
- Replacement of topsoil;
- Ripping of compacted areas; and
- Spreading of vegetation debris to return organic matter to the area and provide supplementary seeding with appropriate species. Seed stock will be gathered in 2007, in the area of impact pre-clearance, to provide an effective provenance seed-set for use during rehabilitation practices.

The rehabilitation programme will include development of completion criteria to determine when rehabilitation can be considered self sustaining. Closure considerations will include assessment and remediation of contaminated sites, ongoing placement of waste materials to improve the form of existing waste dump areas, and the rehabilitation of all project disturbed areas, including exploration drill pads. Other considerations concerning such issues as sourcing of suitable material as a growth medium for substrate regrowth will be further discussed in the PER and associated project Conceptual Closure Plan.

Additionally a suitable pit abandonment strategy will be developed and detailed in the Conceptual Closure Plan given that the area will revert to a tourist destination after closure. This strategy will also incorporate the wishes of the local shire and DOCEP for safe tourism access.

5.5 DUST & PARTICULATES

5.5.1 Management Objectives

The objectives for the management of dust emissions are to:

- Ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards;
- Minimise dust associated with the construction and operation of the mines; and
- Minimise exposed surfaces through clearing minimisation, staged clearing and progressive rehabilitation.

5.5.2 Applicable Standards and Guidelines

- EPA Guidance Statement No. 18 Prevention of Air Quality Impacts from Land Development Sites (EPA, 2000);
- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005); and

- Air Quality and Air Pollution Modelling Guidance Notes (Department of Environmental Protection WA, 2000).

5.5.3 Potential Impacts

All activities including clearing, mining, hauling, crushing, screening and stockpiling of the ore has the potential to generate dust which will be minimised by using water sprays, where appropriate, covered and skirted conveyors at ore transfer points, sealing of relevant joints and installation of a dust collection system. Correct equipment design, correct operational procedures and adequate operator training will ensure that no significant fugitive dust occurs.

Localised dust will be generated from the movement of vehicles at the mine site and from handling of ore. The lay down and loading areas will be unsealed and subject to dusting when dry. The degree of dust generated will depend on the moisture content of the ground surface during preparation and the climatic conditions.

Dust will be generated during the construction period from the earthworks, stripping of the mine site, movement of vehicles and from exposed bare ground. Desktop dust modelling will simulate the effect of these activities and this will be discussed in full in the PER.

The dust modelling report on the area undertaken by Sinclair Knight Mertz Engineering , 2006 (SKM) indicates that in general dust levels in this location should not form a significant issue. Residences surrounding these operations are several kilometres away and hence should experience little impact. The most sensitive receptor in this location is the Koolanooka TEC, which according to SKM's assessment should in general experience impact below NSW dust emission standard TSP levels and be well below levels which are recognised to cause a health impact to such vegetative species, as demonstrated in vegetative health studies, full references for this work will be provided in the PER. Midwest have committed to the use of water trucks to wet operational surfaces as necessary and to conduct monitoring and auditing of impacts to the bordering TEC vegetation, as detailed in the EMP and PER. Further discussion and referencing of this SKM report will be provided in the PER.

Munckton Road and part of the haul road on M70/1013 has been sealed to minimise dust issues generated by heavy haulage. Truck loads will be covered with tarpaulins to minimise dust generated during the transportation of ores to Tilley Siding. Information on the management of dust will be provided in the PER.

At Geraldton Port, the ore will be stockpiled inside a shed constructed by Midwest on Geraldton Port Authority land adjacent to Berth 4 to minimise dust. Lumps and Fines will be loaded onto ships through conveyors with a dust management system including dust extractors at transfer points as currently occur. Operations at Geraldton Port will be managed by Geraldton Port Authority as part of their Environmental Licence under Part V of the *Environmental Protection Act 1986*, and as such issues concerning dust management at the Port do not fall within the scope of this proposal. It should be noted that the proposal will have similar ore handling rates as the Stockpile of Fines Project which is currently running, and that this fines operation will likely cease before the proposed work commences.

The nearest residential premises to the mine that could be affected by site generated dust plumes is 5 km to the south and 3 km to the west. The property 3 km west of the mine site is leased to Midwest on a long term contract for use as exploration offices.

If the Koolanooka pit waters are used for dust suppression they will be blended with bore water to provide a salinity of no greater than 5,000 ppm TDS, where necessary. Currently the Koolanooka pit contains a water body measuring about 9,600 m² in area and estimated 8 m in depth. The water level is about 285 m AHD and a recent sample has a water salinity of 20,000 mg/LTDS (57% of the salinity of seawater). Calculations for a water body of 8 m depth suggest that the original salinity of the groundwater would have been about 2,500 mg/L TDS. Given that groundwater inflow does not keep pace with the summer evaporation of about 11 mm/d, the rate of inflow into the pit at current water levels is calculated to be less than 110 m³/d (Rockwater, 2004).

The blending of pit and bore water to reduce salinity level should ensure no long term salinity issues occur or that this will impede rehabilitation or damage surrounding vegetation. Use of pit waters through such blending will also ensure that a gradual drop in pit water salinity is experienced as these waters will become diluted through groundwater inflow.

Dust suppression may be required in some form at the rail siding proposed at Tilley. Assessment will be conducted on potential impacts from both plume and ambient dust sources at this location with details of this discussed in a mining proposal specific to this aspect. The ore transfer facility at Tilley is not part of this PER. (The ore handling operations at Tilley Siding are the subject of a separate Mining Proposal to be submitted to DoIR.)

5.5.4 Surveys and Investigations

The PER will include a desktop study of the complete project area regarding dust management and will identify appropriate dust management strategies.

5.5.5 Management

Midwest intends to keep dust to a minimum during construction and operation of the Koolanooka and Blue Hills mines. Dust management options will be outlined in the PER document and the project EMP.

The EMP will identify specific management measures to minimise dust generation from all aspects of the project including;

- Incorporation of dust control measures into project design where dust emissions are significant;
- Implementation of dust suppression techniques in areas with high dust generating potential including allocation of a dedicated water truck for this purpose with a second truck to be utilised if necessary;

- Minimisation of vegetation clearing;
- Staged clearing and progressive rehabilitation to minimise exposed areas;
- Regular inspections to visually assess dust generation; and
- Ambient dust monitoring where appropriate.

The commitments within the EMP will be consistent with the amount of dust expected to be generated in various aspects of the project and the environmental and social values to be protected in those areas.

Dust monitoring will be carried out by Midwest on dust levels and on the impact to the vegetative health of the TEC area through the use of static dust monitoring points. SKM dust modelling indicates that on most days this will not be a significant issue and Midwest provides a commitment to halt operations during periods of extreme weather conditions. The commitments made for dust monitoring and auditing will be clearly expressed in the EMP and PER for this proposal.

5.6 GREENHOUSE GAS EMISSIONS

5.6.1 Management Objectives

The objectives for management of gaseous emissions are to:

- Ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards; and
- Minimise emissions to levels as low as practicable on an on-going basis and consider offsets to further reduce cumulative emissions.

5.6.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- EPA Guidance Statement No. 12. Guidance Statement for Minimising Greenhouse Gas Emissions (EPA, 2002);
- EPA Guidance Statement No. 18 Prevention of Air Quality Impacts from Land Development Sites (EPA, 2000);
- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005); and
- Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2002 Series., Australian Greenhouse Office.

5.6.3 Potential Impacts

During the construction and operation of the Mining Project greenhouse gases and other gases will be released to the atmosphere as a result of:

- decomposition of cleared vegetation and release of carbon from the soil;
- combustion of diesel fuel for equipment at the minesite;
- combustion of diesel fuel for the power supply to the project; and
- combustion of diesel fuel for the road trains transporting the product.

5.6.4 Surveys and Investigations

In accordance with EPA Guidance Statement No 12, the annual greenhouse emissions from the project will be calculated and compared with that of similar projects. The methodology used to calculate emissions will be based on the methodology as required by the Australian Greenhouse Office.

5.6.5 Management

Greenhouse gas emission minimisation will be incorporated into mine planning in accordance with EPA Guidance Statement for Minimising Greenhouse Gas Emissions (2002). This will include consideration of energy efficient technology and energy consumption will be considered as a criterion in equipment selection.

Vegetation clearing will be minimised, thereby assisting to minimise greenhouse gas emissions from the project. Progressive rehabilitation of open areas will result in partial offsets of emissions over the life of the project.

Atmospheric emissions will also be reported to the National Pollutant Inventory if they meet the reporting threshold values.

5.7 NOISE AND VIBRATION

5.7.1 Management Objectives

Two residences are located relatively close to Koolanooka mine. The first residence is located approximately 5 km to the south of the mining operations at the minesite. The property is known as “Dingle Dell”. The second residence is located on Munckton Road 3 km to the northwest of mining operations and is leased to Midwest.

The objectives for the management of noise and vibrations are to:

- Minimise the noise and vibration associated with the construction and operation of the proposal; and

- Protect the amenity of nearby residents from noise and vibration impacts resulting from activities associated with the proposal by ensuring the noise and vibration levels meet statutory requirements and acceptable levels.

5.7.2 Applicable Standards and Guidelines

Applicable Standards and Guidelines include:

- Environmental Protection (Noise) Regulations 1997, Western Australian Government;
- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005);
- Statement of Planning Policy Road and Rail Transport Noise (WAPC, 2005); and
- AS2670:2001 Evaluation for human exposure to whole body vibration.

5.7.3 Potential Impacts

Mining

Mining operations will be undertaken 24 hours a day on a continuous basis and ore will be loaded into trucks using a front end loader/hydraulic excavator.

Road Transportation

Ore will be transported from Blue Hills to the Koolanooka site via the upgraded existing Mt Karara/Mungada Haul Road and then along existing roads and heavy haulage routes to Geraldton Port where it will be loaded for export. The use of the Mt Karara/Mungada Haul Road for transportation of ore from Blue Hills to the gazetted Shire Road (Mungada Road) will require the haul road to be upgraded back to its original width to accommodate haulage trucks.

The transportation route follows gazetted roads as defined in the *Road Traffic Act 1974* therefore no noise amelioration is required. The noise from the heavy haulage trucks propulsion and braking systems and received at the residences located along the transportation route will comply with the *EPA Draft Guidance Statement for EIA No 14 (Version 3) Road and Rail Transportation Noise*.

5.7.4 Surveys and Investigations

Noise modelling will not be undertaken at the Koolanooka mine site as this aspect is not expected to be a significant issue.

The distance of the two homesteads closest to the mining operations (3km and 5km) does not warrant noise modelling especially as noise has not been raised as an issue in the past from these two homesteads and that the closest residence is leased for use by Midwest.

Mining activity is also already in operation with work currently being conducted on the DSO fines project, and thus any noise created will be similar to the existing noise, although blasting activities have not yet commenced at this site.

It is felt that noise modelling will also not be required at the two Mungada pits for similar reasons. That is noise complaints have not been received previously and the nearest residences are at a significant distance.

Noise modelling will be undertaken at the proposed siding at Tilley, a location closer to residential areas, and this will be discussed further in its site specific Mining Proposal.

No further studies are proposed on transportation noise evolution.

5.7.5 Management

All practicable measures will be implemented to minimise noise emissions generated by mining and processing activities. Noise management measures that may be considered include:

- Design and layout of mine site (eg stockpile locations) to minimise noise emission;
- Purchase of plant and equipment with reduced sound pressure levels; and
- Blasting during daylight hours and modification of blasting practices to reduce noise emissions.

Management of employee noise exposure will be in compliance with the *Mines Safety and Inspection Act 1994*. This will include engineering plant design solutions to minimise noise generation and/or propagation, on-going monitoring of noise exposure levels, use of personal protective equipment and appropriate operational practices.

5.8 WASTE ROCK

5.8.1 Management Objectives

The objectives for the management of waste rock materials are to:

- Ensure that waste is placed and managed to negate or control impacts to surface water and groundwater and there is no long-term impacts on the surrounding environment; and
- Clearly identify potentially acid generating material, selectively handle this material and store the material so that leachate is not generated.

5.8.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- Environmental Notes on Mining Waste Rock Dumps (DoIR, 2001);
- Environmental Notes on Mining Acid Mine Drainage (DoIR, 2006);
- Mine Void Water Issues in WA (WRC, 2003);
- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005).

5.8.3 Potential Impacts

Notwithstanding the very low potential for acid generation, Midwest will analyse the sulphur content of the mine waste as part of mine operations. If necessary a full analysis of the material's composition, pH, conductivity (saturated paste), total sulphur, net acid generation, acid neutralising capacity and total soluble metals will be undertaken and the results supplied in the PER.

5.8.4 Surveys and Investigations

Geochemical and physical analysis of existing and potential waste rock material will be undertaken where necessary and detailed in the PER.

5.8.5 Management

Overburden stockpiles will be planned and constructed in compliance with the Environmental Notes on Mining Waste Rock Dumps (DoIR, 2001), and the Guidelines for Mining Proposals in Western Australia (DoIR, 2006), to ensure construction of a cost efficient and effective rehabilitation to a safe, stable, non-polluting landform, with an agreed post mining land use. Although production of sulphidic overburden on this project is unlikely, strategies will be implemented, where necessary, to neutralise acids produced from overburden material.

Backfilling of the pits is not planned at this stage, due to the relatively small size of the pits and the intended overburden stockpile areas. Overburden stockpiles will be developed considering the surrounding landscape and will be set in place to improve stockpile areas laid down from previous operations where possible, to improve the aesthetic appeal of the area. Waste rocks will be located in an area that minimises any impact to visual amenity and decreases impacts on the area's future status and use as a conservation reserve. Waste rock rehabilitation requirements will be discussed in the Conceptual Closure Plan

Waste dump design will consider the physical nature of material and landform stability, chemical nature of waste materials, associated pollution prevention, integration into surrounding landscape and revegetation issues. For example, planned disposal of waste rock at West Mungada will consider the proximity to the pit edge.

5.9 SOLID, HAZARDOUS AND LIQUID WASTES

5.9.1 Management Objectives

The objectives for waste management are to:

- Reduce the volume of waste through product selection, reuse and recycling;
- Ensure that waste is contained and isolated from groundwater and surface water, and that storage, treatment or collection does not result in long term impacts on the surrounding environment;
- Have all site generated waste removed by a licenced contractor and disposed of in the Morawa community landfill; and
- Minimise the environmental impacts of hydrocarbons / chemicals (solvents, cleaning fluids etc.) through appropriate storage, handling and disposal.

5.9.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- Water Quality Protection Guidelines No. 10 Mining and Mineral Processing Above-ground fuel and chemical storage (Department of Water, 2000);
- Australian Standard 1940-2004 : The storage and handling of flammable and combustible liquids;
- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005);
- Guidance Note S301, Storage of Dangerous Goods Licensing and Exemptions (DoIR, 2004);
- Dangerous Goods (Transport) (Road and Rail) Regulations 1999, Government of Western Australia; and
- Australian Code for the Transport of Dangerous Goods by Road and Rail (National Road Transport Commission and ACTDG, 2005).
- Used Tyre Strategy for Western Australia, Waste Management Board, 2005.

5.9.3 Potential Impacts

The construction and operation of the DSO Mining Project will generate the following types of wastes:

- Domestic waste;
- Recyclable products;

- Waste oils, greases and lubricants;
- Organic debris including vegetation;
- General refuse including waste metal, cardboard and packaging;
- Sewage; and
- Inert waste including excess fill.

These wastes have the potential to impact on the environment if not managed appropriately.

5.9.4 Surveys and Investigations

All waste streams (solid and liquid) will be identified and their management, storage, and disposal strategies will be included in the PER and EMS.

5.9.5 Management

General Waste

No onsite waste disposal will be undertaken on this project and domestic and construction waste will be minimised through reuse and recycling where able. General waste will be managed by a licensed contractor and removed from site for disposal in an approved landfill.

Consideration will be given to the best design and operation of short term waste storage facilities to be used by the waste removal contractor. Storage facilities will be designed so as to minimise infiltration of water, formation of leachates, and distribution of litter by wind and water and will include effective fire management. More details on the specifics of short term waste management will be provided in the project EMP.

Waste production will be audited periodically to identify new opportunities for reduction, re-use and recycling and used tyres will be stored in accordance with Part 6 of the *Environmental Protection Act 1986 and Regulations*. These commitments will also be provided in the PER and EMP for this proposal.

Sewage and grey water from the mine operations will be treated on-site using approved septic tank and leach drain systems.

Liquid effluent generated at the site including oils and water from the workshop will be managed in accordance with relevant legislation.

Hazardous Substances

During construction and operations, hazardous substances will be stored according to Australian Standard 1940. Storage of bulk fuel will be in above ground tanks within banded, impermeable enclosures or in double skinned tanks.

Hazardous substance management will be incorporated in the project EMP. Procedures for the correct handling, storage, spill management and clean up will be included in the EMP. Spill response equipment will be located in the vicinity of work areas, with site personnel trained in spill response management.

Refuelling, workshop and vehicle washdown areas will be constructed to prevent discharge of spills, leaks or wastes and will be fitted with drains, bunds or oil / water separators, where appropriate.

Storage of explosives will be in a remote magazine in accordance with the *Explosives and Dangerous Goods Act 1961*.

Hazardous waste and spilled hazardous materials will be removed from site by a licensed contractor for disposal in an approved facility in accordance with the requirements of the controlled waste regulations.

5.10 SOCIAL AND CULTURAL ENVIRONMENT

5.10.1 Management Objectives

The objectives for management of the social and cultural environment are to:

- Avoid disturbance to cultural and heritage sites;
- Ensure compliance with relevant legislation including the *Heritage of Western Australia Act 1990* and the *Aboriginal Heritage Act 1972*; and
- Respect the rights of all land owners.

5.10.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- EPA Guidance Statement No. 41. Assessment of Aboriginal Heritage (EPA, 2004); and
- Guidelines for Consultation with Indigenous People by Mineral Explorers (DoIR, 2004).

5.10.3 Potential Impacts

Koolanooka Minesite

Approval to disturb two previously recorded sites has been obtained under Section 18 of the *Aboriginal Heritage Act 1972*. An additional rock shelter site is remote from the DSO Mining Project and will not be impacted.

Disturbance to aboriginal heritage sites DIA 4496 and DIA 5868 was applied for after the granting of the Company's mining licences and covers the entire length of the Koolanooka Hills. Under Section 18(3) of the *Aboriginal Heritage Act 1972*, Midwest has been granted consent by the Minister for Indigenous Affairs to use its mining leases to "undertake mining operations through an extension of the existing open pit operations." This consent was granted to Midwest in December 2003 and is contingent on meeting the various obligations and responsibilities under the *Aboriginal Heritage Act 1972*.

No Aboriginal groups have made objections to the granting of the Mining Leases or to previous mining operations in the area.

The DSO Mining Project will have minimal impact on the heritage values of the Koolanooka Iron Ore Mine. Midwest will ensure a photographic record of the existing mine pit is maintained.

Blue Hills Minesite

If the proponent needs to disturb the observed archaeological sites at this location, Midwest will obtain consent from the Minister for Indigenous Affairs under Section 18 of the *Aboriginal Heritage Act 1972* prior to any such activity occurring.

Mt Karara/Mungada Haul Road

The DSO Mining Project will not impact on Aboriginal Heritage sites in regard to the Mt Karara/Mungada haul road, as only previously cleared roadside verge vegetation will be impacted at this location. The re-alignment of this haul road will not impact on any areas of new vegetation and as such will not impact any potential aboriginal heritage.

5.10.4 Surveys and Investigations

Koolanooka Minesite

No further studies are proposed as part of the DSO Mining Project.

Blue Hills Minesite

No further studies are proposed as part of the DSO Mining Project.

Mt Karara/Mungada Haul Road

No further studies are proposed as part of the DSO Mining Project.

5.10.5 Management

The locations of existing registered sites will be taken into account to minimise and avoid where possible, impacts to aboriginal sites. Registered sites will not be removed, damaged or altered without Section 18 approval from the Minister of Indigenous Affairs, under the *Aboriginal Heritage Act 1972*.

Aboriginal community representatives and elders will be consulted as part of the planning process for mining and construction activities and management plans will be discussed and agreed upon.

Any significant new sites identified during ethnographic and archaeological survey or construction will not be removed, damaged or altered without approval under Section 18 of the *Aboriginal Heritage Act 1972*.

Training will be provided to all personnel detailing the importance of avoiding heritage sites and of reporting of any suspected heritage sites. Exclusion zones will also be identified and clearly communicated to project personnel

Therefore management requirements regarding Aboriginal Heritage preservation include:

- Full assessment for the presence of Heritage sites as necessary;
- Consultation with appropriate groups of interest and elders regarding these matters;
- Gaining approval for any intended impact on heritage areas;
- Establishment of appropriate exclusion zones with fencing and signage of these areas if required;
- Training of the workforce and contractors on any relevant heritage requirements;
- Establishment of a dedicated heritage management plan if required, and discussion of heritage considerations within the site EMP; and
- The requirement to report potential heritage areas or artefacts if encountered during the project.

Authorised light vehicle traffic will be allowed full use of the Mt Karara / Mungada Haul road, of particular concern to CALM for access to the Karara Station conservation management area.

As the Koolanooka mine is listed in the Morawa Heritage Inventory, Midwest has photographed the site prior to the commencement of earthworks.

Midwest has established a local Community Development Fund in Morawa which aims to support local business ventures and the community in general. As part of this undertaking Midwest will include a local employment clause in all project related contracts, which will also be a requirement of Midwest's contractors.

Midwest will also endeavour to fulfil the desired social outcomes of the Morawa Shire Council and Shire of Perenjori, concerning the local areas influenced by this project, including consideration of accommodation, transport, small business use, servicing, and local education and training options.

5.11 VISUAL AMENITY, LANDFORM AND GEOCONSERVATION

5.11.1 Management Objectives

The objectives for management of visual impact, landscape and geo-heritage are to:

- Minimise project impacts to community use and access to significant environmental features;
- Ensure landscape values are considered and measures are adopted to reduce the visual impacts of the project; and
- Maintain and protect any significant landscape and geo-heritage values and maintain the integrity, ecological functions and environmental values of the soil and landform.

5.11.2 Applicable Standards and Guidelines

Applicable standards and guidelines include:

- EPA Guidance No. 33 Environmental Guidance for Planning and Development (EPA, 2005);
- WA Planning Commission Statement of Planning Policy No. 2, Environment and Natural Resource Policy (WAPC, 2004).

5.11.3 Potential Impacts

The anthropocentric or (geo)heritage values of the mine are significant and it is listed in the Morawa Heritage Inventory with the recommendation that, should the mine ever be re-opened, the site be photographed prior to the commencement of earthworks. The DSO Mining Project will minimise impact on the anthropocentric or (geo)heritage values of the BIF, and Midwest will ensure a photographic record of the mine is maintained.

5.11.4 Surveys and Investigations

The PER will include a discussion on how the geoconservation values of the area will be protected and retained.

5.11.5 Management

The extent of landform impacts resulting from mining activities is being investigated as part of the mine feasibility study. Overburden stockpiles will be located in an area that minimises any impact to visual amenity and shaped to mimic local landforms where possible. Considerations of final landform will be incorporated into the Conceptual Closure Plan (CCP). The CCP will be made available to stakeholders for comment as part of the EIA process.

Roads and other infrastructure will be designed and located in a way that minimizes long term impacts on the areas future status and use as a conservation reserve. Infrastructure

removal and rehabilitation of the site to final land use requirements will be carried out upon closure.

5.12 SUSTAINABILITY

Sustainability in relation to this proposal will be discussed further in the PER, but refer to section 1.6 for discussion of general sustainability principles and how they relate to the DSO project.

5.13 OFFSETS

Midwest is open to discussion regarding offsets for 2.4 ha of project impact on the Koolanooka TEC disturbance. This may take the form of research funding attributed to CALM or DEC related management in the local area, involvement with rehabilitation projects in farmland areas near the site or Town of Morawa, direct assistance with control of feral goats by reduction programs or fencing, if this is viewed positively by the local community, or other similar options.

There is the potential for Midwest to support and collaborate with local and regional bodies, such as the regional natural resource management body, the Northern Agricultural Catchment Council. As the project area falls within the Yarra Yarra subregion Midwest has the capability to participate in the activities of the subregional group of this body.

A number of other projects such as Hidden Treasures (DEC) and Bush Brokers (WWF) are operating in the area to identify and protect areas of conservation significance and Midwest could also consider contributing to these projects as part of a negotiated offset package.

TABLE 5.1 ENVIRONMENTAL MANAGEMENT SUMMARY

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
Biophysical					
Flora & Vegetation	Within the Avon-Wheatbelt & Yalgoo Bioregions, within which the proposal is located.	<p>The objectives for the management of flora and vegetation are to:</p> <ul style="list-style-type: none"> Maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge; Minimise the loss of and adverse impacts to native vegetation and plant habitats; and Protect Rare and Priority Flora species that occur within the proposal area. 	<p>Koolanooka</p> <p>The development of the DSO Mining Project will result in the clearing of 2.4ha of vegetation immediately abutting the existing Koolanooka pit. No clearing will be required for the waste dumps, processing area, temporary offices, workshop and ablutions. The vegetation type to be cleared for the extension of the existing open cut pit is Closed Tall Scrub dominated by <i>Acacia assimilis subsp. assimilis</i>, <i>Allocasuarina campestris</i> and <i>Melaleuca filifolia</i> over Herbland of mixed species and bare ground. This vegetation type is one of the vegetation types comprising the Koolanooka System TEC, which has been classified as vulnerable by the WA Threatened Ecological Communities Scientific Committee. This vegetation system is naturally restricted to the two known existing occurrences at Koolanooka Hills and the nearby Perenjori Hills, south east of Koolanooka Hills (CALM, 2003).</p> <p>6.26 ha of disturbed land currently exists within the Koolanooka TEC due to previous exploration activities. Cumulative impacts of the proposed Project on the Koolanooka TEC will be further discussed in the PER.</p> <p>No species of conservation significance are anticipated to be impacted on by the mining associated with the DSO Mining Project (Figure 9).</p> <p>Ruby Dock (<i>Acetosa vesicaria</i>), is an extensive weed problem in the area. The development of the DSO mining project has the potential to exacerbate the current condition and spread the infestation to other</p>	<p>Koolanooka Minesite</p> <p>A desktop assessment based on information from the Western Australian Threatened Species and Communities Unit (WATSCU) will be undertaken to determine the significance of the impact on vegetation and TEC at a regional scale.</p> <p>Quantitative footprint surveys are to be undertaken on the TEC area of impact at Koolanooka and the results of this survey will be discussed in the PER.</p> <p>Midwest will liaise with the DEC to discuss an appropriate offset for the proposed impact on the Koolanooka System TEC.</p> <p>The details of the result of all these activities will be discussed in the PER.</p> <p>Blue Hills Minesite</p> <p>A detailed survey of the 4.5 ha impact footprint was undertaken to assess for the presence of rare or priority</p>	<p>Vegetation Clearing</p> <ul style="list-style-type: none"> Although initial mine plans only include clearing in mine pit expansion areas, careful mine site planning may allow for avoidance, minimization and / or offset impacts from required clearing of flora and vegetation, including impacts to flora of conservation interest. Midwest is committed to addressing the key principals of native vegetation protection as listed in Schedule 5 of the <i>Environmental Protection Act 1986</i>. This will be addressed as part of Flora surveys and in the project EMS and EMP. Topsoil and vegetation from all clearance activity will be separately stockpiled in dedicated stockpile areas, with controlled clearance practices concerning soil removal and stockpiling in place and to be further described in the PER. Weed mapping will be undertaken on and adjacent to areas of impact related to the project, prior to initial disturbance and at intervals throughout the life of the project and at closure. Weed dispersal shall be controlled via establishment of weed hygiene procedures, and with staff being trained on the presence of established weeds

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
			<p>areas.</p> <p>Blue Hills</p> <p>Two species of conservation significance were recorded:- <i>Persoonia pentasticha</i> (P2), <i>Cryptandra imbricata</i> (P3) and possibly a third one: - <i>Stenanthemum poicilum</i> (P3) from within the Blue Hills survey area during the Bennett Environmental Consulting 2003 vegetation and flora survey. Flowering collections of the plant identified as <i>Stenanthemum poicilum</i> need to be collected to confirm its identity. A flora survey will determine the presence of these species within the Blue Hills impact area.</p> <p>Transportation of the Ore</p> <p>Clearing of regrowth along both sides of the haul road from Mungada to Koolanooka is required to facilitate road trains and general mining traffic. The potential clearing is estimated at 33 ha (55 km x 3 m each side of the road).</p> <p>Cumulative Impacts</p> <p>Midwest is aware of the proposed activities of another company (Gindalbie Metals) which if approved will be developed in close proximity to the Midwest work intended in the Blue Hills. As such the PER for the Midwest DSO mining project will discuss the expected cumulative impacts of these two proposals within the Blue Hills area. Particular attention will be given to the cumulative impacts on priority flora species, including in particular discuss on impacts to the species <i>Acacia sp.</i> Blue Hills Range R.J. (Cranfield 8582) (P1) and <i>Lepidosperma sp.</i> Karara BIF (A. Markey & S. Dillon) (P1).</p>	<p>flora, and this will be discussed in the PER.</p> <p>Transportation of Ore</p> <p>A Mining Proposal based study has commenced on the proposed Tilley siding rail loading facility near Morawa. Ore will be transported to this facility by road train along Munckton road, which is already being used for transport of ore on the Stockpile of Fines Project. A General Purpose Lease exists for ore handling and transfer to rail along this road.</p>	<p>within the DSO project areas, and within the local area. Management of weeds will be discussed further in the PER for this proposal.</p> <ul style="list-style-type: none"> • Wildfire from accidental ignition will be avoided as far as possible. <p>Rare and Priority Flora</p> <p>Midwest will comply with the requirements of the <i>Wildlife Conservation Act 1950</i> and <i>Environment Protection and Biodiversity Conservation Act 1999</i> by undertaking the following:</p> <ul style="list-style-type: none"> • Rare Flora baseline surveys will be conducted for all disturbance areas and locations of any Declared Rare and Priority Flora taxa will be incorporated into an Environmental Geographical Information System (GIS) and plotted onto maps; • Avoid impact to species of Declared Rare and Priority flora or Conservation Significance by using information from flora surveys conducted in the area; • Implement measures to limit the extent of vegetation clearing, e.g. marking clearing limits; • Consistent with existing vegetation management procedures, areas will be re-surveyed if information from the existing surveys does not provide sufficient information about the location of such species;

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
					<ul style="list-style-type: none"> • Liaise with DEC regarding the management of Rare, Priority and Significant Flora; and • Where appropriate Midwest will prepare and implement a Threatened Flora Management and Conservation Plan for the Project to address management of Threatened Flora impacted by the proposed development. <p>Weeds</p> <p>Weed dispersal shall be controlled via establishment of weed hygiene procedures, and with staff being trained on the presence of established weeds within the DSO project areas, and within the local area. Management of weeds will be discussed further in the PER for this proposal.</p> <p>Paterson’s Curse (<i>Echium plantagineum</i>) has been found to be present in the Blue Hills locality, and management considerations will be provided within the EMP for this project to limit potential impacts and spread of this weed.</p> <p>Ruby Dock (<i>Acetosa vesicaria</i>) is a significant problem in the works area. Any weed populations discovered during floristic surveying on project areas by ecologia will be discussed and addressed in the PER.</p> <p>If generated by works activities:</p> <ul style="list-style-type: none"> • Ruby Dock and Paterson’s curse plants will have a suitable glyphosphate herbicide, eg Roundup, applied; and • If needed, the appropriate herbicide will be applied once Ruby Doc and Paterson’s Curse plants are in full

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
					foliage and actively growing, and before it sets seed.
Fauna	Within the Avon-Wheatbelt Bioregions, within which the proposal is located.	<p>The objectives for management of terrestrial fauna are to:</p> <ul style="list-style-type: none"> Maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge; and Minimise the impact to fauna. 	<p>Koolanooka Minesite</p> <p>Ninety five species of vertebrate fauna were identified during the 2003 fauna survey comprising 12 mammals (6 introduced), 57 birds (1 introduced) and 25 reptile species. A number of species of vertebrate fauna with conservation significance have been recorded from the area; however none will be impacted by the proposed DSO Mining Project, to the significant detriment of the species.</p> <p>Malleefowl (<i>Leipoa ocellata</i>) has been recorded from the study area in the past. Two Malleefowl mounds were located within the study area during the 2003 fauna survey (Figure 11). However, both mounds were inactive and there was no evidence of Malleefowl being present within the study area during the 2003 fauna survey. One inactive mound will be impacted by the DSO Mining Project. This will be considered an environmentally significant location. The Malleefowl is listed as a Schedule 1 species under the <i>Wildlife Conservation Act</i> and as Vulnerable and a Migratory species under the <i>Environmental Protection and Biodiversity Conservation Act</i>. The project will not affect the conservation status or distribution of the species.</p> <p>One colony of the Western Spiny-tailed Skink (<i>Egernia stokesii badia</i>), which is classified as Schedule 1 under the <i>Wildlife Conservation Act 1950</i> and as Endangered under the <i>Environment Protection and Biodiversity Conservation Act, 1999</i>, was recorded in the proposed project area during the fauna survey in a degraded area with tin and abandoned car bodies surrounding farmhouses. The population will not be impacted by the DSO Mining Project.</p> <p>A number of migratory bird species listed under the <i>Environmental Protection and Biodiversity Conservation Act</i> were observed in the study area</p>	<p>Koolanooka Minesite</p> <p>A desktop assessment will be undertaken for the PER to determine the conservation significance of the site for fauna in a regional context.</p> <p>Following advice from the EPA Services Unit, the need for additional studies to determine potential impacts on short range endemics such as millipedes, spiders and land based snails was discussed with the WA Museum (Dr Mark Harvey, pers com) and UWA (Barbara Main, pers com). In their opinion the impact of the project on short range endemics at Koolanooka was likely to be minimal and thus felt there was a reduced need for surveying in this area. A risk assessment will be conducted on this issue at both Koolanooka and Blue Hills, for release in the PER, to further discuss the risk of project impact to short range endemics.</p> <p>Subterranean Fauna</p> <p>Subterranean Fauna may occur in suitable substrate such as limestone strata and paleochannels within the Midwest/Yilgarn area. The</p>	<ul style="list-style-type: none"> Impacts to fauna from vegetation clearing will be minimised by reducing the clearing footprint where possible and conducting staged clearing. Disturbed areas will be rehabilitated as soon as possible, with ongoing rehabilitation throughout the mine life to facilitate habitat restoration. Drill holes will be capped to prevent fauna entrapment and fatalities. Operational control procedures and employee training programs will be implemented to protect native fauna from intentional harm, and to appropriately manage injured fauna if found. Wildfire from accidental ignition will be avoided as far as is possible Midwest may look into installing high pitched whistles on the front of road trains working the Blue Hills haul road, in an attempt to scare away fauna and reduce fauna deaths due to use of the road. <p>Fauna of Conservation Significance</p> <p>Midwest will comply with the requirements of the <i>Wildlife Conservation Act 1950</i> and <i>Environment Protection and Biodiversity Conservation Act 1999</i> by undertaking the following:</p> <ul style="list-style-type: none"> Rare fauna baseline surveys will be conducted for all disturbance areas and locations of any fauna of conservation significance will be incorporated into an Environmental Geographical Information System (GIS) and plotted onto maps;

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
			<p>including the Brown Goshawk, Wedge-tailed Eagle, Spotted Harrier, Australian Shelduck, Brown Falcon, Nankeen Kestrel, Tree Martin, Welcome Swallow, and Rainbow Bee-eater. It is unlikely the mining activity will substantially modify, destroy or isolate an area of important habitat of any of these migratory species, or seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of any of the species.</p> <p>The proposed clearing of 2.4 ha of vegetation for the DSO Mining Project will have a minimal impact on fauna habitat.</p> <p>Blue Hills Minesite</p> <p>A fauna survey of the Blue Hills area was undertaken by Bamford Consulting Ecologists in 2004.</p> <p>A total of 55 vertebrate species were identified during a previous survey (Allan Tingay, <i>et al.</i>, 1996), comprising nil mammals, 33 birds, 21 reptiles and 1 amphibian species.</p> <ul style="list-style-type: none"> • Many of the bird, reptile and mammal species in the region shelter in crevices or hollows, in shrubs and trees. Dead trees are regarded as valuable habitat and will be protected, and the collection of firewood from the area will be prohibited. • Caves in the Blue Hills are important for some fauna and contain historically significant nests of stick-nest rats. Access to these caves by project personnel will be controlled. • Feral animals in the area have adverse impacts on native wildlife, and will not be encouraged by site related refuse. <p>Mt Karara/Mungada Haul Road</p>	<p>Mongers Lake paleochannel system is located several kilometres to the north of Koolanooka Hills (Rockwater, 2004).</p> <p>Groundwater abstraction for the DSO Mining Project is unlikely to impact subterranean fauna as there will be no impact on substrates prospective for that fauna. Additionally only established bores and pit waters will be utilised for water supply at Koolanooka, waters which are already in use for current operations, and as such contain little risk that their use will impact on significant stygofauna populations. Accordingly no additional studies relating to subterranean fauna are proposed at Koolanooka.</p> <p>Blue Hills Minesite</p> <p>A desktop assessment will be undertaken for the PER to determine the conservation significance of the site for fauna in a regional context.</p> <p>Subterranean Fauna</p> <p>As excavation of both the East and West Mungada pits will not proceed below the water table, there will be no dewatering required at this location. Water for proposal activities will be sourced from established bores where</p>	<ul style="list-style-type: none"> • Endeavour to avoid impact to individuals and habitats of fauna of conservation significance, including inactive Malleefowl mounds, by using information from fauna surveys conducted in the area; • Measures to limit the extent of vegetation clearing, e.g. marking clearing limits; • Areas will be re-surveyed if information from the existing surveys does not provide sufficient information about the location of such species; • Liaise with DEC regarding the management of fauna of conservation significance; • Implement operational control procedures, site inductions and employee training programs to protect native fauna from intentional harm, and to appropriately manage injured fauna if found; and • Any death of fauna of conservation significance will be reported to DEC. <p>In addition, to help protect Malleefowl, Midwest will:</p> <ul style="list-style-type: none"> • Join the Malleefowl Preservation Society; • Record sightings of nests both active and inactive; and • Record sightings of birds in time/number/location.

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			<p>The Malleefowl (<i>Leipoa ocellata</i>) is listed as a Schedule 1 species under the <i>Wildlife Conservation Act</i> and as Vulnerable and a Migratory species under the <i>Environmental Protection and Biodiversity Conservation Act</i>. As the fauna survey conducted by <i>Bamford Consulting Ecologists in 2004</i> indicates, the proposal is not anticipated to affect the conservation status or distribution of this species across this location</p>	<p>possible, either from agreement with nearby landholders, or gaining approval to rejuvenating old bores within the Karara station locality.</p> <p>If new bores need to be created to supply project water requirements in this region, and the water quality is such that it is conducive to supporting stygofauna populations, then stygofauna testing will be conducted at these locations.</p> <p>Mt Karara/Mungada Haul Road</p> <p>A desktop assessment will be undertaken for the PER to determine the conservation significance of the site for fauna in a regional context. No further surveys on this area are planned at this stage.</p> <p>Short Range Endemics</p> <p>It is anticipated that Short Range Endemic (SRE) fauna potentially carry a low impact from implementation of the Project. This has been discussed with the WA Museum and the University of Western Australia, and indicates a potentially reduced need for surveying (Dr Mark Harvey, pers com 2006 and Barbara Main, pers</p>	

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
				<p>com 2006 respectively).</p> <p>A Project risk assessment has been conducted on potential impact on SREs at both Koolanooka and Blue Hills and this indicates there is a risk of impact to SREs, particularly concerning three Wildlife Protection Act 1950 Schedule 1 species that may potentially occur in the impact area. These are three trap door spider species known to inhabit the north-eastern agricultural/ Midwest region, <i>Idiosoma nigrum</i>, <i>Aganippe castellum</i> (Idiopidae) and <i>Kwonkan eboracum</i> (Nemesiidae).</p> <p>ecologia Environment surveyed for SREs in early 2007 within the proposal impact areas and are currently awaiting identification of species. The results of these surveys will be discussed within the PER.</p> <p>Troglofauna</p> <p>Based on site inspections of the proposed impact areas by zoologists, geologists and environmental scientists, there is no evidence of cavities open to the surface in the proposal impact area, and only minimal cavities have been encountered during test drilling. It is considered extremely unlikely that impacts to troglofauna will be</p>	

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				<p>significant on this Project.</p> <p>In order to confirm the impact areas are devoid of troglofauna of significance, trap baited sampling has commenced on site. The findings of this assessment will be discussed within the PER</p>	
<p>Surface & Groundwater Hydrology</p>	<p>Groundwater and surface waters within the hydrological zone of influence to this proposal.</p>	<p>The objectives for management of surface & groundwater are to:</p> <ul style="list-style-type: none"> • Control and contain contaminated water on site to prevent entry into the natural drainage system and surrounding vegetation; • Maintain the quality and quantity of surface & groundwater so that existing and potential environmental values, including ecosystem maintenance, are protected; • Maintain the integrity, ecological functions and environmental values of wetlands; and • Minimise impacts to surface & groundwater resources during mining. 	<p>The potential impacts of the DSO Mining Project on surface waters are likely to be minimal. There is the potential for contamination of surface waters resulting from sedimentation, erosion, hydrocarbons and chemical spillage at the minesite. The transportation of ore on existing roads is expected to have negligible impact on surface water flows.</p> <p>The DSO Mining Project has minimal potential to impact on groundwater quality through spillages of liquid chemicals and diesel and the disposal of various forms of solid and liquid wastes.</p> <p>During high rainfall events the effect of stormwater discharge from the site may need to be controlled, potentially via a sediment trap system. This possibility will be considered further in the PER.</p>	<ul style="list-style-type: none"> • The impact of groundwater extraction on local and regional groundwater will be assessed and detailed in the PER. • The quality of the water to be used for dust suppression within the mine site and its potential to impact on vegetation will be assessed. 	<p>Trigger values and proposed groundwater management strategies for the mine site will be outlined in the PER document. Groundwater monitoring will be used in conjunction with groundwater modelling and trigger values to ensure that the identified groundwater environmental values are preserved where necessary.</p> <p>Management of hydrocarbon contaminated water and soils will be discussed in the PER for this proposal, detailing response to contamination events, and will also discuss management of ongoing issues through the implementation of appropriate site structures such as washdown bays, remediation facilities and oil water separators.</p> <p>Mine Pits</p> <p>Groundwater extraction will be in compliance with a 5C Licence to Take Groundwater (if required) under the Rights in Water and Irrigation Act 1914. No process water will be discharged from the mine site, and all groundwater required will be utilised for dust suppression activities.</p> <p>The mine will be designed to ensure the safe storage and handling of hazardous materials (such as hydrocarbons) to prevent</p>

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					<p>offsite contamination, and the construction and operation EMP will be developed to minimise the risk of spills and contamination to groundwater.</p> <p>Landfill and overburden stockpiles will be constructed with sufficient surface to groundwater table distance (with considerations to hydroconductivity of the geology) to minimise the potential for groundwater contamination. Physical barriers such as clay or artificial liners will be used to prevent contamination where required.</p> <p>Approval from the DEC will be obtained prior to undertaking any works at river crossings. Traditional custodians will also be consulted prior to project works where appropriate.</p>
<p>Mine Planning Decommissioning and Rehabilitation</p>	<p>Proposal site.</p>	<p>The objectives for decommissioning and rehabilitation are to:</p> <ul style="list-style-type: none"> • Ensure that rehabilitation achieves a long term safe, stable and functioning landform which is consistent with the surrounding landscape and other environmental values; and • Fulfil commitments made to stakeholders and regulators regarding closure outcomes. 	<p>The DSO Mining Project impacts two locations, Koolanooka and Blue Hills.</p> <p>At Koolanooka ore will be excavated from areas that have already been disturbed or partially mined but which are external to the existing pit. The South Fold Orebody will be excavated from a cut back to the immediate south-southeast of the old pit with ore being transported to the plant site via a combination of existing and new haul roads. The remnant and pisolite ores will be accessed from existing mining benches on the western wall of the pit without having to establish new mine benches. The Blue Hills the East and West Mungada pits will be brought back into operation and will be connected to Koolanooka through re-instating the Mt Karara / Mungada Haul road.</p>	<p>A Conceptual Closure Plan will be developed and made available for review with the PER document.</p> <p>The Conceptual Closure Plan will detail ultimate land use, rehabilitation objectives and completion criteria to ensure no significant environmental impacts remain present after closure.</p>	<p>Decommissioning will comprise the safe dismantling and removal of infrastructure, the appropriate disposal of waste materials and the impacted areas returned to an array of vegetation types and fauna habitats that reflect the pre-disturbance state as closely as possible. Where the removal of non-visible infrastructure, or features that have been incorporated into the natural landscape may cause more environmental damage than if left in situ, then their retention will be discussed with the relevant authorities at the time.</p> <p>Formation of Waste rock stockpiles will be done progressively over the projects duration, taking into account desirable final landform and rehabilitation requirements. Waste dumps from previous mining will also be amended, where feasible, for this purpose. Specifically the Northern Waste dump alongside the public access road will be reshaped, have erosion issues addressed,</p>

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					<p>and be rehabilitated, with the proviso that this does not require a clearing permit, will require no different plants or materials than will new waste dumps, and the result is not inconsistent with planned final land use.</p> <p>Rehabilitation will occur progressively where possible as disturbed areas are no longer utilised. Should Midwest not undertake further operations upon the completion of mining, all sites impacted by the project will be rehabilitated. Rehabilitation activities will include;</p> <ul style="list-style-type: none"> • Re-establishment of stable landform with erosion protection for long term stability; • Replacement of topsoil; • Ripping of compacted areas; and • Spreading of vegetation debris to return organic matter to the area and provide supplementary seeding with appropriate species. Seed stock will be gathered in 2007, in the area of impact pre-clearance, to provide an effective provenance seed-set for use during rehabilitation practices. <p>The rehabilitation programme will include development of completion criteria to determine when rehabilitation can be considered self sustaining. Closure considerations will include assessment and remediation of contaminated sites, ongoing placement of waste materials to improve the form of existing waste dump areas, and the rehabilitation of all project disturbed areas, including exploration drill pads. Other considerations concerning such issues as sourcing of suitable material as a growth</p>

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					<p>medium for substrate regrowth will be further discussed in the PER and associated project Conceptual Closure Plan.</p> <p>Additionally a suitable pit abandonment strategy will be developed and detailed in the Conceptual Closure Plan, given that the area will revert to a tourist destination after closure. This strategy will also incorporate the wishes of the local shire and DOCEP for safe tourism access.</p>
Dust & Particulates	Proposal site and surrounding area.	<p>The objectives for the management of dust emissions are to:</p> <ul style="list-style-type: none"> • Ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards; • Minimise dust associated with the construction and operation of the mines; and • Minimise exposed surfaces through clearing minimisation, staged clearing and progressive rehabilitation. 	<p>All activities, including clearing, mining, hauling, crushing, screening and stockpiling of the ore has the potential to generate dust which will be minimised by using water sprays, where appropriate, covered and skirted conveyors at ore transfer points, sealing of relevant joints and installation of a dust collection system. Correct equipment design, correct operational procedures and adequate operator training will ensure that no significant fugitive dust occurs.</p> <p>Localised dust will be generated from the movement of vehicles at the mine site and from handling of ore. The lay down and loading areas will be unsealed and subject to dusting when dry. The degree of dust generated will depend on the moisture content of the ground surface during preparation and the climatic conditions.</p> <p>Dust will be generated during the construction period from the earthworks, stripping of the mine site, movement of vehicles and from exposed bare ground. Desktop dust modelling will simulate the effect of these activities and this will be discussed in full in the PER.</p> <p>The dust modelling report on the area undertaken by Sinclair Knight Mertz Engineering (SKM) indicates that in general dust levels in this location should not form a significant issue. Residences surrounding these operations are several kilometres away and hence should experience little impact. The most sensitive</p>	<p>The PER will include a desktop study of the complete project area regarding dust management and will identify appropriate dust management strategies.</p>	<p>Midwest intends to keep dust to a minimum during construction and operation of the Koolanooka and Blue Hills mines. Dust management options will be outlined in the PER document and the Project EMP.</p> <p>The EMP will identify specific management measures to minimise dust generation from all aspects of the project including;</p> <ul style="list-style-type: none"> • Incorporation of dust control measures into project design where dust emissions are significant; • Implementation of dust suppression techniques in areas with high dust generating potential, including allocation of a dedicated water truck for this purpose, with a second truck to be utilised if necessary; • Minimisation of vegetation clearing; • Staged clearing and progressive rehabilitation to minimise exposed areas; • Regular inspections to visually assess

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			<p>receptor in this location is the Koolanooka TEC, which according to SKM's assessment should in general experience impact below NSW dust emission standard TSP levels, and be well below levels which are recognised to cause a health impact to such vegetative species, as demonstrated in vegetative health studies. Midwest have committed to the use of water trucks to wet operational surfaces as necessary, and to conduct monitoring and auditing of impacts to the bordering TEC vegetation, as detailed in the EMP and PER. Further discussion and referencing of this SKM report will be provided in the PER.</p> <p>Munckton Road and part of the haul road on M70/1013 has been sealed to minimise dust issues generated by heavy haulage. Truck loads will be covered with tarpaulins to minimise dust generated during the transportation of ores to Tilley Siding. Information on the management of dust will be provided in the PER.</p> <p>At Geraldton Port, the ore will be stockpiled inside a shed constructed by Midwest on Geraldton Port Authority land adjacent to Berth 4 to minimise dust. Lumps and Fines will be loaded onto ships through conveyors with a dust management system including dust extractors at transfer points as currently occur. Operations at Geraldton Port will be managed by Geraldton Port Authority as part of their Environmental Licence under Part V of the <i>Environmental Protection Act 1986</i>, and as such issues concerning dust management at the Port do not fall within the scope of this proposal. It should be noted that the proposal will have similar ore handling rates as the Stockpile of Fines Project which is currently running, and that this fines operation will likely cease before the proposed work commences.</p> <p>The nearest residential premises to the mine that could be affected by site generated dust plumes is 5 km to the south and 3 km to the west. The property 3 km west of the mine site is leased to Midwest on a long term contract for use as exploration offices.</p> <p>If the Koolanooka pit waters are used for dust</p>		<p>dust generation; and</p> <ul style="list-style-type: none"> Ambient dust monitoring where appropriate. <p>The commitments within the EMP will be consistent with the amount of dust expected to be generated in various aspects of the project and the environmental and social values to be protected in those areas.</p> <p>Dust monitoring will be carried out by Midwest on dust levels and on the impact to the vegetative health of the TEC area, through assessment of static dust monitoring points. SKM dust modelling indicates that on most days this will not be a significant issue and Midwest provides a commitment to halt operations during periods of extreme weather conditions. The commitments made for dust monitoring and auditing will be clearly expressed in the EMP and PER for this proposal.</p> <p>Further dust management strategies will be outlined in the PER document and Project EMP.</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
			<p>suppression they will be blended with bore water to provide a salinity of no greater than 5,000 ppm TDS, where necessary. Currently the Koolanooka pit contains a water body measuring about 9,600 m² in area and estimated 8 m in depth. The water level is about 285 m AHD and a recent sample has a water salinity of 20,000 mg/LTDS (57% of the salinity of seawater). Calculations for a water body of 8 m depth suggest that the original salinity of the groundwater would have been about 2,500 mg/L TDS. Given that groundwater inflow does not keep pace with the summer evaporation of about 11 mm/d, the rate of inflow into the pit at current water levels is calculated to be less than 110 m³/d (Rockwater, 2004).</p> <p>Such blending to reduce salinity should ensure no long term salinity issues occur, or that this will impede rehabilitation or damage surrounding vegetation. Use of pit waters through such blending will also ensure that a gradual drop in pit water salinity is experienced as these waters will become diluted through groundwater inflow.</p> <p>Dust suppression may be required in some form at the siding rail project proposed at Tilley, assessment will be conducted on potential impacts from both plume and ambient dust sources at this location, with details of this discussed in a mining proposal specific to this aspect. (The ore handling operations at Tilley Siding are the subject of a separate Mining Proposal to be submitted to DoIR).</p>		
Greenhouse Gas Emissions	Global Atmosphere	<p>The objectives for management of gaseous emissions are to:</p> <ul style="list-style-type: none"> Ensure that emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements 	<p>During the construction and operation of the Mining Project, greenhouse gases and other gases will be released to the atmosphere as a result of:</p> <ul style="list-style-type: none"> decomposition of cleared vegetation and release of carbon from the soil; combustion of diesel fuel for equipment at the minesite; combustion of diesel fuel for the power supply to 	<p>In accordance with EPA Guidance Statement No 12, the annual greenhouse emissions from the project will be calculated and compared with that of similar projects. The methodology used to calculate emissions will be based on the methodology as required by the Australian Greenhouse</p>	<p>Greenhouse gas emission minimisation will be incorporated into mine planning in accordance with EPA Guidance Statement for Minimising Greenhouse Gas Emissions (2002). This will include considering a selection of energy efficient technology and energy consumption will be considered as a criterion in equipment selection.</p> <p>Vegetation clearing will be minimised, thereby assisting to minimise greenhouse</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
		<p>and acceptable standards; and</p> <ul style="list-style-type: none"> Minimise emissions to levels as low as practicable on an on-going basis and consider offsets to further reduce cumulative emissions. 	<p>the project; and</p> <ul style="list-style-type: none"> combustion of diesel fuel for the road trains transporting the product. 	Office.	<p>gas emissions from the project. Progressive rehabilitation of open areas will result in partial offsets of emissions over the life of the project.</p> <p>Atmospheric emissions will also be reported to the National Pollutant Inventory if they meet the reporting threshold values.</p>
Noise & Vibration	Proposal site and surrounding area.	<p>Two residences are located relatively close to Koolanooka mine. The first residence is located approximately 5 km to the south of the mining operations. This property is known as "Dingle Dell". The second residence is located on Munckton Road 3 km to the northwest of mining operations and is leased to Midwest.</p> <p>The objectives for the management of noise and vibrations are to:</p> <ul style="list-style-type: none"> Minimise the noise and vibration associated with the construction and operation of the proposal; and Protect the amenity of nearby residents from noise and vibration impacts resulting from activities associated with the proposal by ensuring the noise and vibration levels meet statutory requirements and acceptable levels. 	<p>Mining</p> <p>Mining operations will be undertaken 24 hours a day on a continuous basis and ore will be loaded into trucks using a front end loader/hydraulic excavator.</p> <p>Road Transportation</p> <p>Ore will be transported from Blue Hills to the Koolanooka site via the upgraded existing Mt Karara/Mungada Haul Road and then along existing roads and heavy haulage routes to Geraldton Port where it will be loaded for export. The use of the Mt Karara/Mungada Haul Road for transportation of ore from Blue Hills to the gazetted Shire Road (Mungada Road) will require the haul road to be upgraded back to its original width to accommodate haulage trucks.</p> <p>The transportation route follows gazetted roads as defined in the <i>Road Traffic Act 1974</i> therefore no noise amelioration is required. The noise from the heavy haulage trucks propulsion and braking systems and received at the residences located along the transportation route will comply with the <i>EPA Draft Guidance Statement for EIA No 14 (Version 3) Road and Rail Transportation Noise</i>.</p>	<p>Noise modelling will not be undertaken at the Koolanooka mine site as this aspect is not expected to be a significant issue.</p> <p>The distance of the two homesteads closest to the mining operations (3km and 5km) does not warrant noise modelling, especially as noise has not been raised as an issue in the past from these two homesteads, and that the closest residence will be leased for use by Midwest. Mining activity is also already in operation with work currently being conducted on the DSO fines project, and thus any noise created will be similar to the existing noise, although blasting activities have not yet commenced at this site.</p> <p>It is felt that noise modelling will also not be required at the two Mungada pits for similar reasons, noise complaints have not been received previously and the nearest residences are at a</p>	<p>All practicable measures will be implemented to minimise noise emissions generated by mining and processing activities. Noise management measures that may be considered include:</p> <ul style="list-style-type: none"> Design and layout of mine site (eg stockpile locations) to minimise noise emission; Purchase of plant and equipment with reduced sound pressure levels; and Blasting during daylight hours and modification of blasting practices to reduce noise emissions. <p>Management of employee noise exposure will be in compliance with the <i>Mines Safety and Inspection Act 1994</i>. This will include engineering plant design solutions to minimise noise generation and / or propagation, on-going monitoring of noise exposure levels, use of personal protective equipment, and appropriate operational practices.</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
				<p>significant distance.</p> <p>Noise modelling will be undertaken at the proposed siding at Tilley, a location closer to residential areas, and this will be discussed further in its site specific Mining Proposal.</p> <p>No further studies are proposed on transportation noise evolution.</p>	
Waste Rock	Proposal Waste Rock disposal areas.	<p>The objectives for the management of waste rock materials are to:</p> <ul style="list-style-type: none"> • Ensure that waste is placed and managed to negate or control impacts to surface water and groundwater and there is no long-term impacts on the surrounding environment; and • Clearly identify potentially acid generating material, selectively handle this material and store the material so that leachate is not generated. 	Notwithstanding the very low potential for acid generation, Midwest will analyse the sulphur content of the ore waste as part of mine operations. If necessary a full analysis of the material's composition, pH, conductivity (saturated paste), total sulphur, net acid generation, acid neutralising capacity and total soluble metals will be undertaken, and the results supplied in the PER.	Geochemical and physical analysis of existing and potential waste rock material will be undertaken where necessary, and detailed in the PER.	<p>Overburden stockpiles will be planned and constructed in compliance with the Environmental Notes on Mining Waste Rock Dumps (DoIR, 2001), and the Guidelines for Mining Proposals in Western Australia (DoIR, 2006), to ensure construction of a cost efficient and effective rehabilitation to a safe, stable, non-polluting landform, with an agreed post mining land use. Although production of sulphidic overburden on this project is unlikely, strategies will be implemented, where necessary, to neutralise acids produced from overburden material.</p> <p>Backfilling of the pits is not planned at this stage, due to the relatively small size of the pits and the intended overburden stockpile areas. Overburden stockpiles will be developed considering the surrounding landscape, and will be set in place to improve stockpile areas laid down from previous operations where possible, to improve the aesthetic appeal of the area. Waste rocks will be located in an area that minimises any impact to visual amenity and decreases impacts on the area's future status and use as a conservation reserve. Waste</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
					<p>rock rehabilitation requirements will be discussed in the Conceptual Closure Plan</p> <p>Waste dump design will consider the physical nature of material and landform stability, chemical nature of waste materials, associated pollution prevention, integration into surrounding landscape and revegetation issues. For example, planned disposal of waste rock at West Mungada will consider the proximity to the pit edge.</p>
Solid, Hazardous and Liquid Wastes	Proposal site	<p>The objectives for waste management are to:</p> <ul style="list-style-type: none"> • Reduce the volume of waste through product selection, reuse and recycling; • Ensure that waste is contained and isolated from groundwater and surface water, and that storage, treatment or collection does not result in long term impacts on the surrounding environment; • Have all site generated waste removed by a licenced contractor and disposed of in the Morawa community landfill; and • Minimise the environmental impacts of hydrocarbons / chemicals (solvents, cleaning fluids etc.) through appropriate storage, handling and disposal. 	<p>The construction and operation of the DSO Mining Project will generate the following types of wastes:</p> <ul style="list-style-type: none"> • Domestic waste; • Recyclable products; • Waste oils, greases and lubricants; • Organic debris including vegetation; • General refuse including waste metal, cardboard and packaging; • Sewage; and • Inert waste including excess fill. <p>These wastes have the potential to impact on the environment if not managed appropriately.</p>	<p>All waste streams (solid and liquid) will be identified and their management, storage, and disposal strategies will be included in the PER and EMS.</p>	<p>General Waste</p> <p>No onsite waste disposal will be undertaken on this project, and domestic and construction waste will be minimised through reuse and recycling where appropriate. General waste will be managed by a licensed Contractor and removed from site for disposal in an approved landfill.</p> <p>Consideration will be given to the best design and operation of short term waste storage facilities to be used by the waste removal contractor. Storage facilities will be designed so as to minimise infiltration of water, formation of leachates, and distribution of litter by wind and water, and will include effective fire management. More details on the specifics of short term waste management will be provided in the project EMP.</p> <p>Waste production will be audited periodically to identify new opportunities for reduction, re-use and recycling, and used tyres will be stored in accordance with Part 6 of the <i>Environmental Protection Act 1986 and Regulations</i>. These commitments will also be provided in the PER and EMP</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
					<p>for this proposal.</p> <p>Sewage and grey water from the mine operations will be treated on-site using approved septic tank and leach drain systems.</p> <p>Liquid effluent generated at the site including oils and water from the workshop will be managed in accordance with relevant legislation.</p> <p>Hazardous Substances</p> <p>During construction and operations, hazardous substances will be stored according to Australian Standard 1940. Storage of bulk fuel will be in above ground tanks within bunded, impermeable enclosures, or in double skinned tanks.</p> <p>Hazardous substance management will be incorporated in the project EMP. Procedures for the correct handling, storage, spill management and clean up will be included in the EMS. Spill response equipment will be located in the vicinity of work areas, with site personnel trained in spill response management.</p> <p>Refuelling, workshop and vehicle washdown areas will be constructed to prevent discharge of spills, leaks or wastes and will be fitted with drains, bunds or oil / water separators, where appropriate.</p> <p>Storage of explosives will be in a remote magazine in accordance with the <i>Explosives and Dangerous Goods Act 1961</i>.</p> <p>Hazardous waste and spilled hazardous materials will be removed from site by a licensed contractor for disposal in an approved facility in accordance with the</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
					requirements of the controlled waste regulations.
Social & Cultural Environment	Proposal site.	<p>The objectives for management of the social and cultural environment are to:</p> <ul style="list-style-type: none"> • Avoid disturbance to cultural and heritage sites; • Ensure compliance with relevant legislation including the <i>Heritage of Western Australia Act 1990</i> and the <i>Aboriginal Heritage Act 1972</i>; and • Respect the rights of all land owners. 	<p>Koolanooka Minesite</p> <p>Approval to disturb two previously recorded sites has been obtained under Section 18 of the <i>Aboriginal Heritage Act 1972</i>. An additional rock shelter site is remote from the DSO Mining Project and will not be impacted.</p> <p>Disturbance to aboriginal heritage sites DIA 4496 and DIA 5868 were applied for after the granting of the Company's mining licences and covers the entire length of the Koolanooka Hills. Under Section 18(3) of the <i>Aboriginal Heritage Act 1972</i>, Midwest has been granted consent by the Minister for Indigenous Affairs to use its mining leases to "undertake mining operations through an extension of the existing open pit operations." This consent was granted to Midwest in December 2003 and is contingent on meeting the various obligations and responsibilities under the <i>Aboriginal Heritage Act 1972</i>.</p> <p>No Aboriginal groups have made objections to the granting of the Mining Leases or to previous mining operations in the area.</p> <p>The DSO Mining Project will have minimal impact on the heritage values of the Koolanooka Iron Ore Mine. Midwest will ensure a photographic record of the existing mine pit is maintained.</p> <p>Blue Hills Minesite</p> <p>If the proponent needs to disturb the observed archaeological sites at this location, Midwest will obtain consent from the Minister for Indigenous Affairs under Section 18 of the <i>Aboriginal Heritage Act 1972</i> prior to any such activity occurring.</p>	<p>Koolanooka Minesite</p> <p>No further studies are proposed as part of the DSO Mining Project.</p> <p>Blue Hills Minesite</p> <p>No further studies are proposed as part of the DSO Mining Project.</p> <p>Mt Karara/Mungada Haul Road</p> <p>No further studies are proposed as part of the DSO Mining Project.</p>	<p>The locations of existing registered sites will be taken into account to minimise and avoid where possible, impacts to aboriginal sites. Registered sites will not be removed, damaged or altered without Section 18 approval from the Minister of Indigenous Affairs, under the <i>Aboriginal Heritage Act 1972</i>.</p> <p>Aboriginal community representatives and elders will be consulted as part of the planning process for mining and construction activities, and management plans will be discussed and agreed upon.</p> <p>Any significant new sites identified during ethnographic and archaeological survey or construction will not be removed, damaged or altered without approval under Section 18 of the <i>Aboriginal Heritage Act 1972</i>.</p> <p>Training will be provided to all personnel detailing the importance of avoiding heritage sites and of reporting of any suspected heritage sites. Exclusion zones will also be identified and clearly communicated to project personnel</p> <p>Therefore management requirements regarding Aboriginal Heritage preservation include:</p> <ul style="list-style-type: none"> • Full assessment for the presence of Heritage sites; • Consultation with appropriate groups of interest and elders regarding these matters; • Gaining approval for any intended impact on heritage areas;

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
			<p>Mt Karara/Mungada Haul Road</p> <p>The DSO Mining Project will not impact on Aboriginal Heritage sites in regard to the Mt Karara/Mungada haul road, as only pre-cleared roadside verge will be impacted at this location. The re-alignment of this haul road will not impact on any areas of new vegetation and as such will not impact any potential aboriginal heritage.</p>		<ul style="list-style-type: none"> • Establishment of appropriate exclusion zones, with fencing and signage of these areas if required. • Training of the workforce and contractors on any relevant heritage requirements • Establishment of a dedicated heritage management plan if required, and discussion of heritage considerations within the site EMP. • The requirement to report potential heritage areas or artefacts if encountered during the project. <p>Authorised light vehicle traffic will be allowed full use of the Mt Karara / Mungada Haul road, of particular concern to CALM for access to the Karara Station conservation management area.</p> <p>As the mine is listed in the Morawa Heritage Inventory, Midwest has photographed sites prior to the commencement of earthworks.</p> <p>Midwest has established a local Community Development Fund, which aims to support local business ventures and the community in general. As part of this undertaking, Midwest will include a local employment clause in all project related contracts, which will also be a requirement of Midwest's contractors.</p> <p>Midwest will also endeavour to fulfil the desired social outcomes of the Morawa Shire Council and Shire of Perenjori, concerning the local areas influenced by this project, including consideration of accommodation, transport, small business use, servicing, and local education and training options.</p>

Environmental Factor	Relevant Area	Environmental Objective	Potential Impact	Additional Investigations	Potential Management
Visual Amenity, Landform and Geo-conservation	Proposal site and surrounding area.	<p>The objectives for management of visual impact, landscape and geo-heritage are to:</p> <ul style="list-style-type: none"> • Minimise project impacts to community use and access to significant environmental features; • Ensure landscape values are considered and measures are adopted to reduce the visual impacts of the project; and • Maintain and protect any significant landscape and geo-heritage values and maintain the integrity, ecological functions and environmental values of the soil and landform. 	<p>The anthropocentric or (geo)heritage values of the mine are significant and it is listed in the Morawa Heritage Inventory, with the recommendation that, should the mine ever be re-opened, the site be photographed prior to the commencement of earthworks. The DSO Mining Project will minimise impact on the anthropocentric or (geo)heritage values of the BIF, and Midwest will ensure a photographic record of the mine is maintained.</p>	<p>The PER will include a discussion on how the geoconservation values of the area will be protected and retained.</p>	<p>The extent of landform impacts resulting from mining activities is being investigated as part of the mine feasibility study. Overburden stockpiles will be located in an area that minimises any impact to visual amenity and shaped to mimic local landforms where possible. Considerations of final landform will be incorporated into the Conceptual Closure Plan. This document will be made available to stakeholders for comment as part of the EIA process.</p> <p>Roads and other infrastructure will be designed and located in a way that minimizes long term impacts on the areas future status and use as a conservation reserve. Infrastructure removal and rehabilitation of the site to final land use requirements will be carried out upon closure.</p>

6.0 APPLICABLE LEGISLATION

Environmental legislation relevant to the Koolanooka / Blue Hills Remnant Direct Shipping DSO Mining Project includes:

- *Aboriginal Heritage Act, 1972;*
- *Agricultural and Related Resources Protection Act 1995;*
- *Environmental Protection Act, 1986;*
- *Explosives and Dangerous Goods Act 1961;*
- *Heritage of Western Australia Act 1990;*
- *Mining Act 1978;*
- *Rights in Water and Irrigation Act 1914;*
- *Conservation and Land Management Act 1984;*
- *Soil and Land Conservation Act, 1945;*
- *Water and Rivers Commission Act 1995;*
- *Waterways Conservation Act 1986; and*
- *Wildlife Conservation Act, 1950.*

7.0 COMMUNITY AND OTHER STAKEHOLDER CONSULTATION PROGRAM

Midwest has undertaken ongoing consultation and liaison with the Shire of Morawa, the Morawa community and landowners in the vicinity of the mine site.

The Shire of Morawa, the Morawa community and the landowners surrounding the minesite support the recommencement of operations at the mine site. Issues raised by the landowners related to management of surface water runoff and continuation of water supplies. Midwest has committed to ensuring that any changes in surface water runoff resulting from the proposal will not adversely impact surrounding land and that should there be any impact on water supplies, the company will amend the impact. Other issues raised included benefits to the town and district and alternative employment opportunities.

A public meeting was held in Morawa on 22 June 2004 and was attended by 75 people. There was strong community support for the reopening of Koolanooka mine.

Two further consultation meetings were held in early December, one in Morawa on 6th December 2006 and one in Perenjori on 7th December 2006.

A final meeting has been agreed to be held in the Perth, which will be open to all relevant agencies and NGOs. Midwest is also prepared to hold a further meeting for the Geraldton community if there is strong interest.

Issues raised by the DEC included concern about the cumulative impact of potential projects on the Koolanooka System Threatened Ecological Community.

As required by the Mining Act, Midwest is entering into agreements with each of the landowners that own freehold land subject to Mining Leases owned by Midwest.

It should also be noted that the Midwest Corporation is an active participant in the Geraldton Iron Ore Alliance and the Yilgarn Iron Ore Environmental Committee.

Specific consultation undertaken with agencies and individuals is detailed in Table 7.1.

TABLE 7.1 DSO PROPOSAL CONSULTATION

Stakeholder Group	Stakeholder Contact
Shire of Morawa	CEO and President of the Shire of Morawa
DEC (CALM) Environmental Protection Branch	Joe Grehan, Nick Woolfrey.
DEC (CALM) Threatened Species Unit	John Blyth, Rosemary Rees, John Riley.
DEC (CALM) Midwest Region	Danielle Eyers, Beth MacKernan
DoIR	Eugene Bouwhuis, Ana Mesquita, Tammie Webb
DEC EPASU	Tim Gentle, Danielle Griffiths and Ray Claudius
Morawa Agricultural College	
Morawa High School	
Landowners	Lindsay, Noeline, Dean and Tonia Clarslake, David and Jodie Baxter, John and Rebecca Cunningham, Robert and

	Susie Moore, Colin and Carol Malcolm, Trevor and Shirley Tapscott, Ashley and Tonia James.
Conservation Council of WA	
Wildflower Society of WA	Brian Moyle
Native Title Claimants	The Widi Mob, Pandawn Descendants, Yamatji Marlpa Barna Baaba Aboriginal Corporation, Mungu Mob.

This Scoping Document will be distributed to the following decision making authorities. (Table 7.2).

TABLE 7.2 DSO SCOPING DOCUMENT DISTRIBUTION

Stakeholder Group	Stakeholder Contact	Number of Copies
DEC (CALM) Head Office	Joe Grehan, Nick Woolfrey.	2
DEC (CALM) Midwest		1
DoIR	Eugene Bouwhuis, Ana Mesquita, Tammie Webb	3
DEC EPA Services Unit	Danielle Griffiths.	3
DoW	Annaleisha Sullivan	1

8.0 STUDY TEAM AND PEER REVIEW

8.1 STUDY TEAM

Mr Bill Mackenzie of Midwest Corporation will manage the project.

Ecologia Environment has undertaken the preparation of this Scoping Document.

The key ecologia Environment team members involved in the undertaking the EIA and preparation of the PER are provided below:

- Mr Mark Cannon – Manager Environment
- Mr Tim Harries – Environmental Advisor

8.2 TECHNICAL EXPERTS

Aboriginal Heritage studies were undertaken by Hames Consulting Group.

Hydrological assessments were undertaken by Rockwater Pty Ltd.

Acoustical studies were undertaken by Vipac.

Dust modelling was undertaken by SKM, John Harper.

8.3 PEER REVIEW

The PER will be reviewed by relevant consultancies and government agencies.

Flora: Yet to be determined

Fauna: Dr G Thompson

Groundwater: Aquaterra

9.0 REFERENCES

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10.0 APPENDIX A

COMMONWEALTH OF AUSTRALIA

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

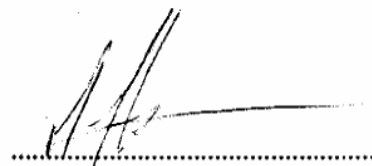
DECISION THAT ACTION IS NOT A CONTROLLED ACTION

I, MARK FLANIGAN, Assistant Secretary, Policy and Compliance Branch, Department of the Environment and Heritage, a delegate of the Minister for the Environment and Heritage for the purposes of section 75 of the *Environment Protection and Biodiversity Conservation Act 1999*, decide that the proposed action, set out in the Schedule, is not a controlled action.

SCHEDULE

The proposed action to develop the Koolanooka Direct Shipping Iron Ore Project to mine and process iron ore, Koolanooka, Western Australia, and as described in the referral received under the Act on 24 November 2004 (EPBC 2004/1886).

Dated this 20 day of DECEMBER 2004



ASSISTANT SECRETARY
POLICY AND COMPLIANCE BRANCH
DEPARTMENT OF THE ENVIRONMENT AND HERITAGE