

Keysbrook Mineral Sands Mine

Peer Review of Biodiversity Aspects

Prepared for
Serpentine - Jarrahdale Shire
by Strategen

April 2010

Keysbrook Mineral Sands Mine

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1. INTRODUCTION

1.1 PURPOSE OF THIS REPORT

This report has been prepared to address the project brief issued jointly by the Serpentine-Jarrahdale Shire and the Shire of Murray, titled “Engagement of Specialist Consultants to Review Biodiversity Implications of Proposed Mineral Sands Mine” (undated). The mineral sands mining proposal has been submitted in the form of a Development Application (DA) and an application for an Extractive Industry Licence (EIL), as required under the by-laws of the two shires.

The project brief prescribes the following objectives:

1. To undertake specific expert review and gap analysis of key reports and management plans submitted in support of the mineral sands extraction proposal
2. To assist both of the local governments decide whether to approve the applications, with or without conditions or refuse the applications and provide reasons to the proponent.

1.2 SCOPE

The project brief requires that this report address the following matters.

1. Define the relevant legislative requirements and standards regarding biodiversity impacts as relevant to a mineral sands extractive industry.
2. Define accepted and best practice for biodiversity management in the context of mineral sands extractive industry.
3. Review background documentation relevant to proposal.
4. Review and critique specified documentation to determine the proposal’s conformance with 1 and 2.
5. Consider the proposal against the requirements of Local Planning Policy 30: Mineral Sands Extraction.

The background documentation (and others) referred to in item 3 are listed in the References at the end of this report.

1.3 PROPOSAL DESCRIPTION

The Keysbrook Mineral Sands Mine proposal¹ area covers 1366 ha total, of which 402 ha will be excavated over the operational life of the mine (8 years approx.). The proposal area contains 181 ha of native vegetation, predominantly of poor condition with little or no understorey. Of this vegetation, a minimum of 75 ha containing the better condition vegetation is to be retained and protected in perpetuity. Areas of native vegetation to be cleared will be rehabilitated at a ratio of 1.4 to 1, which will also include riparian areas and roadside vegetation to improve landscape linkages. The quality of

¹ As per EPA documentation.

the vegetation assemblages is required to be better than that of the existing vegetation, with specific criteria for understorey and mid-storey cover and diversity.

1.4 OTHER APPROVALS OUTSTANDING

The proposal does not require approval under the *Mining Act 1978* (WA) as the land titles for the subject lots pre-date 1 January 1899 and the ownership of mineral sands are vested in the freehold title landowner.

The proposal will require a Works Approval and a Licence under sections 52 and 56, respectively, of the *Environmental Protection Act 1986*. Both of these applications are subject to review by interested parties and public appeal against their conditions or scope.

2. PRELIMINARY FINDINGS

2.1 TASK 1 – DEFINE RELEVANT LEGISLATION AND PUBLISHED ADVICE

The statutes and government policies and guidelines that are considered as the most relevant² to biodiversity impacts associated with the mineral sands industry are defined in Table 1.

2.2 TASK 2 – DEFINE BEST PRACTICE BIODIVERSITY MANAGEMENT STANDARDS

The biodiversity management standards and performance benchmarks generally considered as applicable to the mineral sands mining industry in Western Australia are defined in Table 2.

2.3 TASK 3 – REVIEW OF BACKGROUND DOCUMENTATION

This review has examined the following background information about the proposal:

- *Keysbrook Mineral Sand Project Public Environmental Review* (MBS 2006)
- EPA Bulletin 1269 *Keysbrook Mineral Sands Mine, Olympia Resources Limited*, October 2007.
- EPA Bulletin 1269 *Response to (PER) Submissions* (prepared by MBS for Olympia Resources Limited, June 2007).
- Minister for the Environment Appeal Determination against appeals 99 – 109, 2007 (May 2009).
- Minister for the Environment, *Statement that a Proposal may be Implemented*, No. 810, November 2009.

The *Fauna Management Plan* (MBS 2007b) and *Vegetation and Rehabilitation Management Plan* (MBS 2007c) supplied by the Client were only examined briefly, as both of these documents require further approval under the EPBC and EP Acts and will be extensively revised.

2.4 TASK 4 – CRITICAL REVIEW OF PROPOSAL AGAINST IDENTIFIED REQUIREMENTS AND STANDARDS

2.4.1 Special note

This review does not constitute a criticism of the advice presented to, or decisions made by either the Western Australian Minister for the Environment or the Australian Minister for the Environment and Heritage, their Delegated Officers or their respective agencies, in respect to this proposal. The Client should note that, where appeal rights are conferred to third parties under the relevant State and Commonwealth acts in respect to the proposal, the timeframes for such rights to be exercised have since expired.

² i.e. meaning ‘commonly applied’ - the list is not exhaustive, as any statute can be open to interpretation in regards to scope and application.

2.4.2 Critique of EP Act assessment and outcomes

The EPA has published a list of those environmental values that it considers as ‘critical assets’ and for which it has a presumption against recommending approval of any proposal that has the potential to significantly impact upon them (EPA 2006b, 2008b). A review of the potential environmental impacts associated with the Keysbrook proposal against the list of critical assets shows that it is not unreasonable for the EPA to recommend for the proposal to be approved in its final form (Table 3).

In its assessment of the proposal, the EPA clearly considered that the larger vegetation remnants in good condition or better are, at the very least, high value assets and warrant protection in both the immediate and long term. Accordingly, the excision of these remnants and all riparian vegetation from the mining proposal as well as the onus on the proponent to manage and protect the majority of these is consistent with EPA position (e.g. EPA 2004a, 2004b, 2006b, 2006c).

The EPA further considers that the residual impacts to biodiversity values, i.e. those potentially arising as a result of the clearing of other remnants and trees, can be minimised through conditions and commitments, and also mitigated through a number of offsets (including the management and protection of identified remnants). This is also consistent with EPA position (e.g. EPA 2008a, 2008b).

The mining proposal received approval to proceed from the Western Australian Minister for the Environment on 19 October 2009 (Statement No. 810), with the following conditions to be fulfilled prior to the commencement of works:

- submission of a Compliance Assessment Plan, prepared in accordance with Condition 4
- the protection in perpetuity of a minimum of 75 ha of native vegetation (as identified in Condition 6 of Statement 810)
- submission of a Rehabilitation Management Plan, prepared in accordance with Condition 8
- submission of a Dieback and Weed Management Plan, prepared in accordance with Condition 9
- submission of a Nutrient Management Plan, prepared in accordance with Condition 10
- submission of a revised Water Management Plan, prepared in accordance with Condition 11
- submission of a revised Air Quality and Dust Management Plan, prepared in accordance with Condition 15.

The proponent is also required to submit an unconditional and guaranteed performance bond to an appropriate guarantor, as per Condition 13.

The unavailability of these management plans does not allow an assessment of their compliance with various government positions and guidelines, or with industry Best Practice.

2.4.3 Critique of EPBC Act assessment and outcomes

The Keysbrook mineral sands mining proposal was deemed as a Controlled Action under the EPBC Act on 7 July 2005, for the potential to impact on the following matters of National Environmental Significance (NES):

- Wetlands of International Importance
- Listed Threatened Species and Communities.

The assessment of the referral was delegated to the W.A. EPA, through an accredited process, with the EPA Bulletin (and subsequent Appeals advice) forming part of the Commonwealth assessment. The proposal received approval to proceed from the Commonwealth Minister for the Environment and Heritage on 16 February 2010 (EPBC No. 2005/2163), with the following conditions to be fulfilled prior to the commencement of works:

- submission of a Conservation, Offsets and Rehabilitation Plan to ensure a net gain in the extent and quality of breeding and foraging habitat for *Calyptorhynchus latirostris* (Carnaby's Black-Cockatoo) and *C. baudinii* (Baudin's Black-Cockatoo), as per Condition 2.

No additional information is available from the Department of Environment, Water, Heritage and the Arts (DEWHA) on the basis for its approval decision. However, using the DEWHA Significant Impact Guidelines (DEH 2006) and the information presented by the proponent and the EPA and what is available on the DEWHA website (www.environment.gov.au), the approval decision and conditions do not appear to be inconsistent with the guidelines.

2.4.4 Critique of proposal information against Best Practice benchmarks

The majority of standard expectations in regards to biodiversity protection aims and objectives in the W.A. mining industry are published by the State and Commonwealth Governments (see sections 2.1 and 2.2). However, to determine where the level of performance currently lies in the mining industry, the actual designs, implementation methods and performance targets of real industry case studies must be considered (Table 3). Note that these examples do not explicitly relate to environmental impact assessment, but are rather management documents aimed at the minimisation and mitigation of unavoidable biodiversity impacts. This limits the review in that the proponent/applicant is yet to publish Vegetation Protection and Rehabilitation Plans for its Keysbrook operations.

2.5 TASK 5 – CRITICAL REVIEW OF PROPOSAL AGAINST RELEVANT MATTERS PRESCRIBED IN SHIRE PLANNING POLICY NO. 30

The Serpentine – Jarrahdale Shire's Local Planning Policy No. 30 Mineral Sands Extraction seeks, amongst other things, to 'clearly outline the matters that are required to be addressed by proponents that are seeking approval for mineral sands extraction within the Shire'. The list of matters prescribed in the Policy is quite exhaustive and is well beyond the scope of this review. Accordingly, this review focuses on those matters related to biodiversity impacts (Table 4). As shown in the Table, it is concluded that the Application does not provide sufficient information to demonstrate compliance with the Local Planning Policy, namely the absence of Management Plans for Vegetation Protection and Rehabilitation.

3. GAP ANALYSIS

3.1 SPECIAL NOTE

As stated in the Introduction, the purpose of this critical review is to identify possible gaps in the information presented by the proponent or the conditions emplaced on the proposal through the State and Commonwealth environmental approvals processes, for the consideration by the two Shires in their own planning approvals processes.

A critical limitation to this review is its inability to access and consider those Environmental Management Plans still required from the proponent/applicant by the State and Commonwealth environmental agencies.

In lieu of reviewing the Environmental Management Plans, the Gap Analysis will present a summary of standard expectations and recommendations to be addressed in each plan, in addition to any specifications presented in the State and Commonwealth approvals.

3.2 REQUIREMENT FOR COMMUNITY INPUT

With almost all government and industry guidelines on biodiversity management recognising the importance of community involvement and co-regulation in achieving mutually acceptable sustainability outcomes, it is surprising that such opportunities have not been clearly included in the approval conditions relating to biodiversity, as well as those concerning site emissions.

As lead players in whole-of-landscape biodiversity management and conservation, it would not appear unreasonable for the shires to either stipulate directly, or request the CEO of the DEC, that they have early and ongoing input into the preparation of all environmental management plans required under the Ministerial Approval. Such an approach would be supported by the W.A. Government's own published guidance (e.g. EPA 2004c, DoE 2003).

3.3 CONSIDERATION OF OFFSETS

Additional guidelines apply to the preparation of conservation offsets (DEWR 2007), as per the required (and still to be submitted for review) Conservation, Offsets and Rehabilitation Plan. The DEWHA will consider these guidelines and also other relevant published guidance issued by the Department, such as that relating to assessing the benefits to biodiversity conservation offered by revegetation programs (e.g. Freudenberger & Harvey 2003). Note there is no ready avenue for other parties to provide comment on the Conservation, Offsets and Rehabilitation Plan under the EPBC Act process. Accordingly, it may be appropriate for the Shires to require, through their own legal instruments, that they have input into the preparation of the Conservation, Offsets and Rehabilitation Plan. Such an arrangement might also be considered as beneficial to the outcomes of the Plan by ensuring that any conservation efforts align with the biodiversity management objectives of the two shires.

3.4 PROTECTION OF NATIVE VEGETATION OUTSIDE CLEARING FOOTPRINT

The proponent, as per Condition 6 of Statement 810, is required to protect 75 ha of native vegetation remnants that were previously included in, or adjacent to, the proposed disturbance area. The protection method/instrument must be perpetual and include measures to protect the area from grazing stock and have the objective of maintaining a functioning and self sustaining vegetation community.

In addition to these requirements, the EPA advised in its report to the Minister (EPA 2009a) that it also expected the following:

- an Excised Area Management Plan be developed to improve the condition and function of the vegetation in the area excised, including measures such as “planting of understorey and middle storey species using local species, eradicating weeds, planting dieback resistant species, and enhancing fauna habitat value, through the placement of suitable tree hollows and nesting boxes” (p 19)
- vegetation along the watercourses and within the designated buffer would be enhanced using measures including “planting of understorey and middle storey species, eradicating weeds and planting dieback resistant species” (p 19).

These two expectations have not been explicitly incorporated into the Minister’s conditions. Given the EPA recommendation that the proposal be approved was based on the expectation of the final landscape holding more diverse and secure biodiversity values than the current landscape, there appear good grounds for using other instruments, such as those available to the Shires, to ensure such expectations are met.

3.5 REHABILITATION MANAGEMENT PLAN

On the basis that the EPA is of the expectation that the rehabilitation and vegetation management outcomes will result in an overall benefit to the environment, it is important that these plans are reviewed in a rigorous and transparent manner, both in their preparation and implementation phases. This is particularly relevant to the proponent’s forthcoming Rehabilitation Management Plan (Condition 8), which must comply with EPA Guidance No. 6 *Rehabilitation of Terrestrial Ecosystems* (EPA 2006a). This guidance outlines the minimum information requirements and commitments necessary in rehabilitation plans, in addition to those specified in Condition 8, such as:

- the exact condition, structure, composition, associations and area³ of native vegetation to be cleared, expressed as either hectares, individual trees, or a combination of both
- how the rehabilitation resources (e.g. plants, hollows, seeds, cuttings, root stock, topsoil, subsoil) of these areas will be best utilised
- targets for species diversity and density for all rehabilitation AND enhancement areas, as well as contingency measures that will be implemented if targets are not met
- a final landscape plan, showing how the rehabilitation areas, dieback management zones, conservation areas, riparian zones, etc, relate.

³ Note that no assessment documentation contains an actual area/number of trees to be cleared, presumably owing to the fragmented and poorly defined nature of the remnants.

Although it should be expected that the DEC will require that the Rehabilitation Plan satisfy the EPA guidance, this is not an explicit requirement of approval.

Other aspects that should be addressed in the Rehabilitation Plan include:

- justification for any performance criteria, including the selection of analogue sites
- evidence for the long-term stability of the soils, landforms and hydrology of the retained sites
- placement and nature of shelter belts to enhance landscape and biological connectivity, in addition to their agricultural functions.

3.6 DIEBACK AND WEED MANAGEMENT PLAN

In addition, there are Best Practice guidelines published by DEC (CALM 2004) and the Dieback Working Group (DWG 2005), which will be very relevant to the scope and practical application of the Dieback and Weed Management Plan required by Condition 9 of the Ministerial Statement, but which are not directly referred to. Of important consideration is a combined mapping and risk assessment exercise to determine if, of those areas confirmed to be dieback-free, any such areas are not only protectable, but sufficiently large to make it worthwhile. If such areas are not eminently protectable, the conservation resources may be better directed elsewhere.

3.7 FAUNA MANAGEMENT

The proponent/applicant has committed to implementing the Fauna Management Plan, as presented to the EPA in 2007. While it is likely this plan will be updated in response to the conditions of the EPBC Act approval, it is currently lacking in the following areas:

- clearing protocols, particularly when dealing with habitat trees and timber stockpiles
- procedures and responsibilities for dealing with injured wildlife
- measures to ensure the effectiveness of the relocation of potential nest sites, particularly for competition from other users (e.g. feral bees)
- measures to prevent or reduce the proliferation of feral animals.

The Shires should give consideration to placing conditions requiring an updated Fauna Management Plan that addresses these omissions and other matters as raised during consultation with the Shires and other stakeholders.

4. CONCLUSION

This review has been conducted by senior staff with established experience in biodiversity management, environmental impact assessment and the mining industry, including mineral sands.

The review has identified the decision-making processes of the lead State and Commonwealth environmental agencies and information used in their respective decisions to approve the proposal, with conditions, as being reasonably sound.

The review highlights that both agencies expect a net benefit to the environment, particularly in regards to the management and protection of vegetation communities of the eastern Swan Coastal Plain and their habitat values to significant fauna species.

Such a net benefit can only be achieved through the preparation and proper implementation of Environmental Management Plans that are sufficiently comprehensive in their scope and contain objectives, methods and performance criteria consistent with Best Practice and proven benchmarks.

Unfortunately, the latest iteration of these Management Plans is not available for review.

In lieu of this, the review has identified key points that the forthcoming Management Plans should address to satisfy the preceding requirements.

The review also identifies that, as per the relevant Government and Industry Best Practice guidelines, the Shires should be recognised by the proponent and the government as being key stakeholders in matters relating to biodiversity management and conservation in the proposal area and surrounds.

PART 2 (CHECKLISTS)

Table 1 Legislation and government biodiversity policies & guidelines checklist

| Instrument | Principle requirement/s | Comment |
|---|--|--|
| <i>Environmental Protection Act 1986 Part IV</i> | Avenue for proposals that are likely, if implemented, to have a significant effect on the environment, to be referred to the EPA for assessment. Any such proposal deemed as requiring assessment by the EPA cannot be implemented until receiving approval from the Minister for the Environment. | Proposal was referred to EPA in 2004 and set at a PER level of assessment. Proposal was conditionally approved by the Minister in late 2009. |
| <i>Environmental Protection Act 1986 Part V and regulations</i> | Requires that a Works Approval is required before a premises can become 'prescribed' as per the EP Act Regulations and, for mineral sands operations, a licence is also necessary. | A Works Approval has not yet been applied for from DEC. A licence cannot be issued until all conditions of the Works Approval are satisfied. |
| <i>Environmental Protection Act 1986 Schedule 5</i> | Schedule 5 of the EP Act states that native vegetation should not be cleared if it is at variance with one or more of ten principles defined in the Schedule. | Considered in EPA Bulletin 1269, with statements concerning those principles considered relevant, i.e. A – F. The original proposal did not comply with said principles. |
| <i>Wildlife Conservation Act 1950 and regulations</i> | Protects declared flora or fauna, including those likely to become extinct, rare, or otherwise in need of special protection. | Not Crown land. No Declared Rare Flora were recorded on the site. The three species of Black Cockatoo (<i>Calyptorhynchus</i> spp.) listed under the Act may be impacted indirectly as a result of a lawful activity. |
| <i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i> | Requires actions that are likely to have an impact on matters of national environmental significance to be assessed and approved by the Commonwealth Minister for the Environment and Heritage. | Conditional Approval issued on behalf of the Australian Minister for the Environment and Heritage on 16 February 2010, using EP Act assessment as accredited process. |
| DEC Policy 9. <i>Conserving threatened species and ecological communities</i> (draft) | Addresses the DEC management of the listing/delisting and management of threatened species and communities. | The poor condition of that vegetation that will be removed as part of the proposal was considered to be in too poor condition to meet the definition of a vegetation community. No threatened species will be directly affected. |
| DEWHA Draft Policy Statement: <i>Use of environmental offsets under the Environment Protection and Biodiversity Conservation Act 1999</i> | Environmental offsets can be used under the EPBC Act to maintain or enhance the health, diversity and productivity of the environment as it relates to matters protected by the EPBC Act. | To be addressed in Conservation, Offsets and Rehabilitation Plan, as required by EPBC Act approval. See also Table 3. |
| Best Practice Guidelines for Dieback Management (DWG 2005, CALM 2004) | Sets out the practices considered necessary for the survey and management of dieback, with particular application to the minerals and extractive industries. | To be addressed in the Dieback and Weed Management Plan as required by Condition 10 of Ministerial Statement. |
| EPA Position Statement No. 2: <i>Environmental Protection of Native Vegetation</i> (EPA 2002) | Provides 8 clearing considerations for proposals to remove native vegetation, for consistency with the National Biodiversity Conservation Framework (DEST 1996). | The proposal, as approved, is considered to have addressed the EPA Position Statement, with particular regard to excluding additional areas from mining and increasing reservation status and condition of larger remnants. |

| Instrument | Principle requirement/s | Comment |
|---|--|---|
| EPA Position Statement No. 3: Terrestrial Biological Surveys; EPA Guidance No. 51: Terrestrial Flora and Vegetation Surveys; EPA Guidance No. 56: Terrestrial Fauna Surveys | Contains standards and expectations for effort, methodology and reporting of biological surveys for purposes of EIA in W.A. | Flora and Fauna surveys conducted by respected and experienced specialist consultants. Scope and methodology consistent with guidelines. EPA advice not inconsistent with survey findings and recommendations. Would expect additional recommendations not specifically addressed by EPA conditions to be addressed in subsequent Management Plans. |
| EPA Position Statement No. 4: Protection of Wetlands | Sets the objectives for the identification, mapping, management and conservation of the various wetlands and their associated environments and values in W.A. | Wetlands classified as being of conservation significance on the mine area were confirmed by DEC as being too degraded to warrant such a classification and were downgraded. Conservation category wetlands adjacent to the site will only be temporarily affected. |
| EPA Position Statement No. 7: Principles of Environmental Protection | The five environmental protection principles as ratified in the <i>Environmental Protection Act 1986</i> include the principle of the conservation of biological diversity and ecological integrity (by addressing the biodiversity conservation principles of DEST 1996 – genetic, species and ecosystem diversity). | The EPA gave this principle consideration when it advised the proponent to re-design the proposal. The Rehabilitation Plan, as required by EPA, must ensure it addresses the biodiversity conservation principles e.g. by using local provenance rehabilitation materials. |
| EPA Position Statement No. 9: Environmental Offsets; EPA Guidance No. 19: Environmental Offsets - Biodiversity | Provides the overarching advice about the intent and appropriate use of environmental offset. Offsets are defined by the EPA as environmentally beneficial activities undertaken to negate any adverse environmental impact, to achieve 'no net environmental loss' or, aspirationally, a 'net environmental benefit'. | EPA considered that the long-term biodiversity conservation outcomes, including management and protection of off-site native vegetation remnants, would more than compensate for the loss of the lesser quality vegetation, i.e. a net environmental outcome would be achieved. |
| EPA Guidance No. 6: Rehabilitation of Terrestrial Ecosystems | Allows for the rehabilitation of proposed disturbance areas to be considered in the context of environmental impact assessment and describes the minimum information standards and levels of commitment from proponents. | The EPA considered that the landscape and vegetation disturbances could be satisfactorily rehabilitated. Note that the proposal in its current form excludes larger remnants and creeklines. The forthcoming Rehabilitation Plan must be assessed against EPA Guidance No. 6. |
| EPA Guidance No. 10: Proposals Affecting Natural Areas on SCP | Recognises that not all of the remaining natural vegetation on the SCP can be preserved and sets out those processes to identify and preserve priority areas of each vegetation community and the floristic and landform variations within each. | The poor condition minor remnants, fringes and isolated paddock trees were assessed by the EPA as not constituting regionally significant natural assets. No accepted conservation recommendations would be compromised by the proposal. |
| WAPC SPP No. 2 Environment and Natural Resources Policy | Defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues within the framework of the State Planning Strategy | The proposal does not seem to be in obvious conflict with the measures described in the SPP. However, there are many opportunities present in the SPP for the applicant to better support local and regional conservation measures through coordinated efforts and resources (e.g. 5.1, 5.5). |

Table 2 Biodiversity management standards and benchmarks checklist

| Document | Description | Applicability |
|---|---|---|
| <i>Stewardship</i> (DITR 2006a) | Describes the benefits in pursuing continuous improvement opportunities over the entire life cycle of a mining project by recognising that the mining operation is only temporary in a landscape and community context. A principle of successful stewardship is 'co-regulation', recognising the interests of other stakeholders and potential users of the resource. Aspects of stewardship include: eco-efficiency; external synergies; enduring value, environmental disclosure, etc. | The proposal includes natural resources outside the ownership and permanent control of the proponent. Environmental Management Plans, performance reviews and reports should be inclusive of input from external stakeholders. |
| <i>Mine Rehabilitation</i> (DITR 2006b) | Outlines the principles and leading practices of mine rehabilitation, with emphasis on land form design and revegetation, particularly with native flora. Covers consultation, rehabilitation planning, operations and monitoring. Describes need for expert opinion on the character of the landscape, which may often be sourced from local landholders. | Lack of final rehabilitation plan makes assessment impossible. Guidebook should be consulted when reviewing drafts of the Rehabilitation Plan required by the Ministerial Condition. |
| <i>Biodiversity Management</i> (DITR 2007) | Outlines the key principles and procedures now recognised as leading practice for assessing biodiversity values, namely: identifying any primary, secondary or cumulative impacts on biodiversity values; minimising and managing these impacts; restoring conservation values; managing conservation values on a sustainable basis. | Same as for <i>Stewardship</i> , but with a focus on conservation values. |
| <i>Good Practice Guidance for Mining and Biodiversity</i> (ICMM 2006) | (Addressed in DITR series, above). | |
| <i>Guidelines for Developing and Managing Ecological Restoration Projects</i> (SER 2005) | SER define ecological restoration as the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It is an intentional activity that initiates or accelerates ecosystem recovery with respect to its health (functional processes), integrity (species composition and community structure), and sustainability (resistance to disturbance and resilience). | Lack of final rehabilitation plan makes assessment impossible. Guidebook should be consulted when reviewing drafts of the Rehabilitation Plan required by the Ministerial Condition. |
| Ludlow Mining and Rehabilitation Plan (Cable Sands 2006) | Presents a post-mining land-use plan, describing how soils and vegetation will compare with pre-existing and analogue situations. Describes objectives, procedures, performance criteria, monitoring measures and contingencies for each aspect of rehabilitating the landform and vegetation disturbed by the proposal. Lists all plant taxa that will be used in the rehabilitation program and their predominant propagation method. Plan was produced with significant inputs from external stakeholders. | No final landscape plan has yet been presented (in any form) as part of the proposal. Such a plan should form the preliminary basis for the rehabilitation, conservation and offset plans required by the environmental approvals processes. Plans should include specific and meaningful rehabilitation objectives, methods, performance criteria and contingencies, as per EPA 2006a. |
| Gwindinup North Rehabilitation Plan (Bemax 2006); Cloverdale Rehabilitation Plan (Iluka 2007a) | Rehabilitation and restoration plan for a fragmented landscape containing a variety of conservation and agricultural values. | |

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| Document | Description | Applicability |
|---|---|--|
| Waroona Vegetation Management Plan (Iluka 2006); Cloverdale Vegetation Management and Monitoring Plan (Iluka 2007b) | Describes how the mining operations will minimise their impacts on native vegetation by ensuring plants that are not marked for clearing will be protected, including from other threats such as dieback and grazing. Includes responsibilities for decisions affecting vegetation, clearing protocols, protection measures and monitoring. The protection of specific conservation values are described in greater detail. | There is no specific requirement for such a plan under the current environmental approvals. It is recommended that the shires request such a plan as part of a larger combined biodiversity conservation & enhancement strategy. |

Table 3 Assessment against EPA list of critical and high value biodiversity-related assets

| Asset | Relevance | Comment |
|------------------------------------|--|--|
| Public Conservation Reserve System | Nature reserves, national parks, conservation parks, regional parks, marine parks, marine nature reserves and marine management areas. | Not relevant. |
| Native Vegetation | Where adverse impacts to native vegetation are seriously at variance to the principles to protect native vegetation listed under Schedule 5 of the <i>Environmental Protection Act 1986</i> or associated Regulations. | The EPA noted that the remnant vegetation in the proposed mine is mostly degraded through other processes and that these pressures remain unchecked and the remnants likely to continue to deteriorate. The EPA objective in this situation is to have one or more better quality remnants retained, enhanced and protected. The EPA noted that the proponent had reduced clearing requirements by 87 ha and had agreed to retaining, enhancing and protecting a further 75 ha of better condition remnants. Vegetation along watercourses would be retained. Rehabilitation would focus on restoring and protecting enhanced conservation values by increasing species diversity of rehabilitated areas compared to the pre-cleared vegetation. |
| | Where adverse impacts to a native terrestrial vegetation complex would result in a 30% or less representation of the pre-clearing extent of that vegetation complex in a bioregion (noting however that this threshold has been exceeded in some areas). | |
| | Bush Forever reserves. | |
| Biodiversity | Declared Rare Flora (DRF) - that significantly impacts local populations | None found. |
| | Declared Threatened Fauna - that significantly impacts local populations | The remnant native vegetation within the mine area is degraded and deteriorating, but contains remnant vegetation in an extensively cleared area, and it comprises habitat for native fauna of conservation significance (namely 3 species of Black Cockatoo listed under the Wildlife Conservation Act 1950, as well as the Priority listed species <i>Isodon obesulus fusciventer</i> (Quenda)). The larger patches are considered by DEC to be significant habitat, and together with the smaller patches and individual trees, have important linkage roles. The EPA noted that the removal of some of the larger remnants from the clearing program and the implementation of the Fauna Management Plan should make the proposal environmentally acceptable in that regard. |
| | Having regard for Threatened Ecological Communities (TEC) | None found. |
| | Having regard for the Priority Species List | None found. |
| Wetlands | Ramsar Wetlands core conservation areas | Not relevant. |
| | A wetland listed in the 'A Directory of Important Wetlands in Australia', | Not relevant. |
| | Environmental Protection Policy (EPP) wetlands | Not relevant. |

| Asset | Relevance | Comment |
|----------------------------------|---|---|
| | Conservation Category Wetlands | The EPA noted that approximately 15 resource enhancement wetlands would be cleared as a result of the mining proposal but that these wetlands have been significantly disturbed, and their conservation values are low. After groundwater modelling confirmed that drawdown impacts to adjacent conservation category wetlands would be within seasonal ranges and temporary, the EPA recommended that the adjacent CC wetlands be monitored. |
| Rivers | Wild and Scenic Rivers. | Not relevant. |
| Landscape | Where an important landscape, natural feature or environmental icon will be irreversibly impacted or destroyed. | Not relevant. |
| Ecosystems vulnerable to threats | Where the introduction of a key threatening organism, process or activity threatens, or has potential to threaten, the survival, abundance or evolutionary development of an indigenous species or ecological community as identified for 'biodiversity critical assets'. | Not relevant. |

Table 4 Assessment of proposal against LPP 30 relevant matters (relevant to biodiversity)

| Relevant matter | Relevance | Comment | DMA4 |
|---|--|--|---------------|
| 12. The potential impact on vegetation identified by the WA government as being of regional significance. | Degraded and unprotected examples of the regionally-significant vegetation complexes Bassendean Central and South, Guildford and Southern River occur within the project area. | The majority of vegetation that is classed as being in Good Condition or better has been dropped from the original mine plan and will be enhanced and protected by Conservation Covenant and fenced (75 ha) as per Condition 6 of Statement 810. | EPA |
| 13. The potential impact on biodiversity values identified in the Serpentine Jarrahdale Shire's adopted Local Biodiversity Strategy. | In the short term, the proposal will impact on the Shire's ability to satisfy its natural areas retention goal. | If managed and implemented correctly, the proposal has the potential to aid in the achievement of the Strategy's goals. | LGA |
| 15. The potential for destruction of wildlife habitats. | The proposal will clear up to 222 ha remnant native vegetation, including areas containing nesting habitat for Black Cockatoos. | Refer to #18. | EPA; DEWHA |
| 16. The potential for weed infestation. | 34 weed species exist within the mine area, of which 28 are invasive. Weeds of particular concern are Great brome, Perennial veldt grass, Victorian tea-tree, and Guildford grass. | The Proponent's Weed and Dieback Management Plan, as required by Condition 9 of Statement No. 810, has not yet been submitted for review by EPA or SJSC. | EPA; APB |
| 17. The potential for the spread of <i>Phytophthora cinnamomi</i> (dieback). | Dieback has been confirmed in areas within the mine footprint. | The Proponent's Weed and Dieback Management Plan, as required by Condition 9 of Statement No. 810, has not yet been submitted for review by EPA or SJSC. | EPA; DEC |
| 18 & 20. The potential for impact on matters identified as being of significance under the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> . | Listed NES species (Black Cockatoos) will potentially be impacted by clearing. No listed plant taxa or TEC. | The proposal has received conditional approval under the EPBC Act. | DEWHA |
| 19. The potential impact on fauna identified by the State Government of Western Australia as being of regional significance. | Listed fauna (Black Cockatoos) will potentially be impacted by clearing. | The proposal has received conditional approval from Minister responsible. Vegetation protection, rehabilitation and correct fauna management are aimed at achieving net benefit. | EPA; DEC. |

⁴ DMA: Decision Making Authority. APB Agriculture Protection Board, DEC Dept Environment and Conservation, DEWHA Dept Environment Water Heritage and the Arts, EPA Environmental Protection Authority, LGA – Local Government Authority.

| Relevant matter | Relevance | Comment | DMA4 |
|---|---|--|----------|
| 21. The potential impacts on habitat and ecological corridors for fauna. | Very low population record for terrestrial fauna. Some use by listed bird species. | Riparian corridors will be retained in buffers. EPA expectation for buffers to be enhanced. Recommend final landscape plan that addresses corridors, including shelter belts. | EPA; DEC |
| 22. The potential impact on fauna from accidents, including motor-vehicle conflicts. | Proposal involves mechanical felling of habitat trees and large-scale vehicle movement in general. | Fauna EMP contains no clearing protocols, such as dealing with habitat trees, stockpiled vegetation and injured wildlife. | DEC |
| 23. The potential for competition from, and overgrazing by, farm and feral herbivores and other animals, for example rabbits, goats and honey bees. | The change in land use from rural to mining may coincide with a decrease in agricultural management. There is also evidence that shows feral bees can significantly reduce effectiveness of habitat management measures for hollow-nesting animals. | Vegetation protection areas and rehabilitation areas will be fenced to exclude livestock. Plans should include measures to monitor and control grazing by kangaroos and rabbits. Fauna MP should also consider the impact of feral bees on recolonisation efforts for Black Cockatoos. | EPA; DEC |
| 26. The proposed measures for the rehabilitation of the operational area including actions, responsibilities and contingencies. | Rehabilitation of the disturbed landscape as a measure contributing to a net benefit is a critical part of the proposal. | The Proponent's Rehabilitation Management Plan, as required by Condition 6 of Statement No. 810, has not yet been submitted for review by EPA or SJSC. | EPA; DEC |