

# **Albany Iron Ore Project - Southdown Magnetite Proposal**

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**Grange Resources Limited**

**Report and recommendations  
of the Environmental Protection Authority**

**Environmental Protection Authority  
Perth, Western Australia  
Bulletin 1291  
June 2008**

### **Environmental Impact Assessment Process Timelines**

| <b>Date</b>     | <b>Progress stages</b>  | <b>Time (weeks)</b> |
|-----------------|---|---------------------|
| <b>26/09/05</b> | <b>Level of Assessment set (following any appeals upheld)</b> | <b>-</b>            |
| <b>19/02/07</b> | <b>Proponent Document Released for Public Comment</b>         | <b>73</b>           |
| <b>16/04/07</b> | <b>Public Comment Period Closed</b>                           | <b>8</b>            |
| <b>21/04/08</b> | <b>Final Proponent response to the issues raised</b>          | <b>53</b>           |
| <b>30/06/08</b> | <b>EPA report to the Minister for the Environment</b>         | <b>10</b>           |

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## Summary and recommendations

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the proposal by Grange Resources Limited to construct and operate a magnetite mine located approximately 90 kilometres (km) east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which would include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels.

Section 44 of the *Environmental Protection Act 1986* (EP Act) requires the EPA to report to the Minister for the Environment on the outcome of its assessment of a proposal. The report must set out:

- the key environmental factors identified in the course of the assessment; and
- the EPA's recommendations as to whether or not the proposal may be implemented, and, if the EPA recommends that implementation be allowed, the conditions and procedures to which implementation should be subject.

The EPA may include in the report any other advice and recommendations as it sees fit.

The EPA is also required to have regard for the principles set out in section 4A of the *Environmental Protection Act 1986*.

### Key environmental factors and principles

The EPA decided that the following key environmental factors relevant to the proposal required detailed evaluation in the report:

- (a) Biodiversity;
- (b) Surface water and groundwater;
- (c) Dust;
- (d) Noise; and
- (e) Mine closure and rehabilitation.

There were a number of other factors which were very relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergenerational equity;
- (c) The principle of the conservation of biological diversity and ecological integrity;
- (d) Principles relating to improved valuation, pricing and incentive mechanisms; and
- (e) The principle of waste minimisation.

## Conclusion

The EPA has considered the proposal by Grange Resources Limited to construct and operate a magnetite mine located approximately 90 km east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which will include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels.

The EPA has determined that the key environmental factors relevant to the proposal were biodiversity, surface water and groundwater, dust, noise, and mine closure and rehabilitation. Flora and vegetation, fauna, short-range endemic fauna, stygofauna and environmental offsets were considered by the EPA under the factor of biodiversity.

### Biodiversity

#### *Flora and vegetation*

The DEC advised that the vegetation units located on the mine site are adequately represented in areas outside the project footprint with the exception of the Priority 1 Ecological Community *Eucalyptus pleurocarpa* mallee heath on seasonally waterlogged alluvium, and recommended that offsets be pursued to counterbalance this impact.

Mining would directly impact on the Declared Rare Flora species *Commersonia* sp. Mt Groper approximately 5 years after the commencement of operations.

The DEC advised that the:

- loss of the mine site population area would represent a significant reduction in the range of this species which, with climate change scenarios, could pose a significant risk to the species;
- mine site population is located in the largest area of intact native vegetation of any of the known sites, and also includes non-wetland vegetation, and therefore, it is likely to be the most viable of all the sites in the long term (proposed mining impacts excluded);
- mine site population is considered to be more significant for the conservation of this species than any of the other population sites, if it is appropriately conserved and managed; and
- loss of the mine site population could lead to the threat status of *Commersonia* sp. Mt Groper increasing to “Critically Endangered”.

The EPA considers that significant impacts on *Commersonia* sp. Mt Groper would be unacceptable. The EPA recommends that Condition 6 in Appendix 4 be imposed on the proponent to clearly delineate those areas on the mine site where *Commersonia* sp. Mt Groper is known or likely to occur, via comprehensive sets of AGM coordinates and a suitable figure, and to exclude these areas from mining activities and impacts from dewatering, until such time as a viable off-site population is established or located on secured reserve or a protected area such that the threat status of the species would not change from “Endangered” to “Critically Endangered”.

### *Fauna*

Carnaby's Black Cockatoos and Western Ringtail Possums are unlikely to be impacted by mine site and pipeline construction activities as suitable habitats are found outside the proposal area.

The EPA recommends that Condition 7 in Appendix 4 be imposed on the proponent requiring trapped fauna within open trenches to be cleared by a suitably trained person(s) during specified daily time periods.

### *Short-range endemic fauna*

The EPA notes that mining would impact on one of only two known populations of *Yilgarnia currycomboides*, and that the DEC has recommended that offsets be pursued to counterbalance this impact.

### *Stygofauna*

The EPA notes that the conservation significance of the two stygofauna species that were located within the modelled groundwater drawdown footprint of the mine is unlikely to be impacted by the predicted 0.5 m drawdown in the aquifer at this site.

### *Environmental offsets*

The EPA recommends that the proponent's offset package be defined and developed via negotiation with the DEC or other appropriate body and finalised prior to ministerial approval being granted for the proposal. The EPA also recommends that the proponent's offset package includes the acquisition of land containing, or likely to contain other populations of the:

- Priority 1 Ecological Community *Eucalyptus pleurocarpa* mallee heath on seasonally waterlogged alluvium; and
- short-range endemic (SRE) species *Yilgarnia currycomboides*.

### Surface water and groundwater

The EPA notes that there is insufficient water available within the proposal area and that the proponent is considering other water sources including water harvesting from adjacent catchments, new groundwater borefields, and treated municipal wastewater from the Albany wastewater treatment facility. The proponent is negotiating an option agreement with the Water Corporation to access wastewater which would meet two thirds of the proposals' total water requirement. Should it become necessary for the proponent to obtain surface water and groundwater from adjacent catchments, the proponent would be expected to refer any such proposal to the EPA.

The EPA expects that there will be no discharge of leachate or run-off from the waste rock dumps and tailings storage facilities. The proponent's proposed management measures to minimise the oxidation of potentially acid forming waste rock and tailings are considered to be adequate in terms of reducing the likelihood of leachate or run-off from the waste rock dumps and tailings storage facilities impacting on surface water and groundwater quality. However, the EPA considers that any

discharge of water from the waste rock dumps and tailings storage facilities should be monitored, managed, and treated if necessary to ensure that surface water and groundwater quality are maintained. The EPA recommends that Condition 8 in Appendix 4 be imposed on the proponent.

The EPA considers that potential impacts from the discharge of run-off overflow from the port facility drainage systems can be adequately managed by the proponent's proposed management measures and appropriate Works Approval and Licence requirements under Part V of the *Environmental Protection Act 1986*.

### Dust

The National Environment Protection Measure (NEPM) 24 hour standard for PM<sub>10</sub> is likely to be exceeded at the three nearest residential premises (Grasfeld, Beulah, and Nymann) to the mine site. The EPA recommends that Condition 9 in Appendix 4 be imposed on the proponent.

Only short term impacts from dust from pipeline construction activities are expected due to the relatively short construction period. The conventional dust suppression measures and management practices that would be used by the proponent are considered to be adequate.

The EPA notes that the enclosure of all stockpile sheds, processing areas, shiploader conveyors along with maintaining the concentrate moisture content would minimise the potential for dust related impacts from the port facility. The EPA considers that potential dust impacts from ship loading activities can be adequately managed by the proponent's proposed management measures and requirements of the Works Approval and Licence required under Part V of the *Environmental Protection Act 1986*.

### Noise

The EPA notes that mining operations in the middle and eastern sections of the proposed mine pit are predicted to result in the exceedance of the L<sub>A10</sub> assigned level of 35 dB(A) at night at the three nearest residential premises (i.e. Grasfeld, Beulah, and Nymann). The proponent would need to implement appropriate management measures to ensure that the *Environmental Protection (Noise) Regulations 1997* are not breached at these premises.

Noise levels from pipeline and port facility construction and reclamation activities along the northern shore of Princess Royal Harbour are predicted to exceed applicable L<sub>A10</sub> levels at the nearest residential and commercial premises. The EPA notes that these construction activities would thus need to be undertaken in accordance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997*. Regulation 13 places obligations on the proponent to carry out activities in accordance with the requirements set out in Section 6 of Australian Standard 2436-1981. These obligations include using the quietest equipment which is reasonably available, undertaking construction activities between 7:00 am and 7:00 pm on any day except Sundays and public holidays, and preparing a noise management plan if construction activities would be undertaken outside these times.

In response to the DEC's concerns, the proponent provided a supplementary noise assessment for operations at the proposed port facility. The EPA notes that all major pumps and motors within the port facility are now proposed to be enclosed. As a result, the predicted noise level at the nearest residential premises is now 40.1 dB(A) which is below the assigned level of 47 dB(A), and the predicted noise level at the nearest industrial premises is now 54.2 dB(A) which is below the assigned level of 65 dB(A).

Based on this supplementary modelling, the DEC has advised that noise emissions from operations at the proposed port facility would not significantly contribute to existing noise levels at the nearest noise sensitive premises, and can be managed to comply with the *Environmental Protection (Noise) Regulations 1997*.

#### Mine closure and rehabilitation

In order to ensure the long term success of mine closure and rehabilitation the EPA recommends that Condition 10 in Appendix 4 be imposed on the proponent.

The EPA notes that a mine pit void would remain when mining operations cease and that the potential exists for a pit lake to form within the remaining mine pit void when mining and dewatering operations cease. Pit lakes have the potential to impact on groundwater and attract fauna which may subsequently be harmed, or which may harm surrounding native vegetation. Accordingly, recommended Condition 10 referred to above also includes a requirement that the proponent ensures that the final pit void does not pose a risk to groundwater, fauna, or native vegetation.

The EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4 and summarised in Section 4.

#### **Recommendations**

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for Grange Resources Limited to construct and operate a magnetite mine located approximately 90 km east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which would include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels;
2. That the Minister considers the report on the key environmental factors and principles as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

## Conditions

Having considered the proponent's information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Grange Resources Limited to construct and operate a magnetite mine located approximately 90 km east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which would include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) the prevention of impacts on *Commersonia* sp. Mt Groper on the mine site;
- (b) the clearing of trapped fauna within open pipeline trenches by a suitably trained person(s) during specified daily time periods;
- (c) monitoring and management of leachate or run-off from the waste rock dumps and tailings storage facilities so that they do not adversely affect surface water and/or groundwater quality;
- (d) dust monitoring and management at the mine site; and
- (e) mine closure and rehabilitation.



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# 1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the key environmental factors and principles relevant to the proposal by Grange Resources Limited, to construct and operate a magnetite mine located approximately 90 kilometres (km) east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which would include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels.

The proposal was referred to the EPA on 16 September 2005, and on 26 September 2005 the level of assessment was set at Public Environmental Review (PER) under section 38 of the *Environmental Protection Act 1986*. The PER document was made available for a public review period of 8 weeks commencing on 19 February 2007 and ending on 16 April 2007.

The EPA's decision to assess the proposal at the level of PER was based on five main environmental factors, namely biodiversity, surface water and groundwater, dust, noise, and mine closure and rehabilitation.

The proposal was determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in regard to the Short-billed (Carnaby's) Black-Cockatoo which is listed as Endangered, and the Western Ringtail Possum which is listed as Vulnerable. The EPA is undertaking the environmental impact assessment of the proposal under the bilateral agreement between the Commonwealth and Western Australian Governments.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the key environmental factors and principles for the proposal. The conditions to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides other advice by the EPA, Section 6 presents the EPA's conclusions and Section 7, the EPA's recommendations.

Appendix 5 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

## **2. The proposal**

The Albany Iron Ore Project consists of two interconnected proposals; the Southdown Magnetite Proposal by Grange Resources Limited (Grange) and the Albany Port Expansion Proposal by the Albany Port Authority (APA). The link between the two proposals is such that neither proposal would be implemented on its own.

Grange proposes to construct and operate an open pit magnetite mine at the Southdown Magnetite deposit located approximately 90 km east-north-east of Albany (Figure 1 & Figure 2). The magnetite would be magnetically separated, concentrated, and pumped in slurry form via a 104 km long buried pipeline to new port and berth facilities at Albany Port (Figure 3). The magnetite slurry would be dewatered at the port facility and stored for export to south-east Asia on Cape size vessels. The recovered water would be transported back to the mine for re-use via a return water pipeline located adjacent to the slurry pipeline. About 0.425 hectares (ha) of land would be reclaimed along the northern shore of Princess Royal Harbour to accommodate the pipelines. The port facility would be constructed and operated by Grange and would include a concentrate thickener tank, filter plant, storage shed and ship loader (Figure 3).

The APA proposes to expand the Albany Port to facilitate the access of Cape size vessels and increase the amount of available industrial land for port operations. The proposed expansion would involve dredging parts of Princess Royal Harbour and King George Sound, disposal of excess dredge material in deep water within King George Sound, land reclamation of up to 9.0 ha of Princess Royal Harbour to provide additional industrial land, and the construction of a new berth facility. The APA would lease the additional industrial land and the new berth facility to Grange to accommodate its port infrastructure. This part of the proposal is being assessed by the EPA separately from the Grange proposal. The EPA has yet to report on the dredging and berth proposal by the APA.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 5 of the PER document (ecologia Environment 2007).

**Table 1: Summary of key proposal characteristics**

| <b>Element</b>                           | <b>Description</b>   |
|--|--|
| <b>Mining operations</b>                 |  |
| Project life span                        | Minimum 22 years.  |
| Size of ore body                         | Mineral resource is 479 Mt. Mining schedule is approximately 411.5 Mt.   |
| Ore type                                 | Magnetite.   |
| Ore mining rate                          | 18 - 20 Mtpa (6.6 - 7.0 Mtpa of concentrate).  |
| Waste rock mining rate                   | 40 - 55 Mtpa.  |
| Total estimated production               | Approximately 145 Mt of concentrate.   |
| Estimated area of mine pit               | 400 ha.  |
| Depth of mine pit                        | Up to 300 m below ground surface.  |
| Depth of water table                     | 9 - 24 m below ground surface.   |
| Topsoil stockpiles                       | 70 - 100 ha.   |
| <b>Processing requirements</b>           |  |
| Primary crushing                         | Jaw and cone crushers.   |
| Secondary crushing/grinding              | High pressure grinding rollers and ball mills.   |
| Separation                               | Wet magnetic separation and concentration.   |
| Tailings                                 | Total quantity of tailings material is approximately 268.5 Mt.   |
| Tailings storage facility                | <ul style="list-style-type: none"> <li>External TSF area: 250 ha footprint.</li> <li>Maximum height 40 m.</li> </ul>   |
| Waste rock                               | Total quantity of waste rock: 385 Mbcm.  |
| <b>Mine site infrastructure</b>          |  |
| Maximum annual water requirement         | 2.7 GLpa (60 GL over 22 year mine life).   |
| Total estimated footprint of mining      | 1,590 ha.  |
| <b>Pipelines</b>                         |  |
| Pipeline route and length                | 104 km. Proposed route illustrated in Figure 1.  |
| <b>Port infrastructure</b>               |  |
| Area required                            | Up to 9 ha on reclaimed land made available by the Albany Port Authority.  |
| Infrastructure required for processing   | <ul style="list-style-type: none"> <li>a concentrate thickener tank, two agitated storage tanks, one emergency storage tank, a return water storage tank, a filter plant, and a return water pumping station; and</li> <li>a concentrate storage shed with reclaim facilities having a minimum storage capacity of 350,000 tonnes (concentrate stockpile will be fully enclosed in storage shed).</li> </ul> |
| Infrastructure required for ship loading | <ul style="list-style-type: none"> <li>a wharf and ship loader capable of loading concentrate into Cape size vessels, and conveyors and other material handling equipment.</li> </ul>  |

**Abbreviations**

GL gegalitres  
 GLpa gegalitres per annum  
 ha hectares  
 km kilometres  
 m metres

Mbcm million bank cubic metres  
 Mt million tonnes  
 Mtpa million tonnes per annum  
 TSF Tailings storage facility

Source: Modified version of Table S1 from ecologia Environment, 2007.

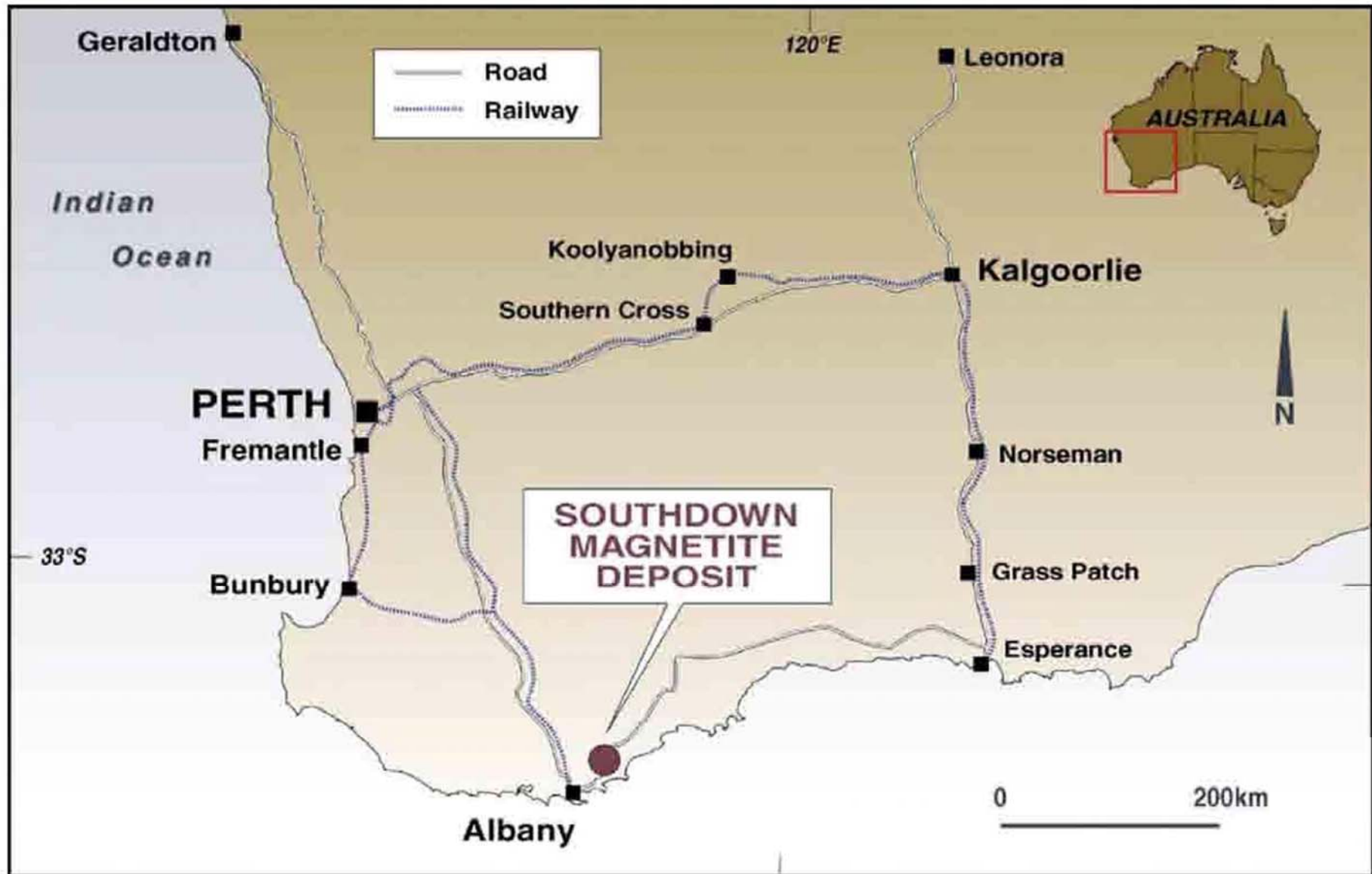


Figure 1: Regional location (Source: Figure 2.1 from *ecologia Environment*, 2007)

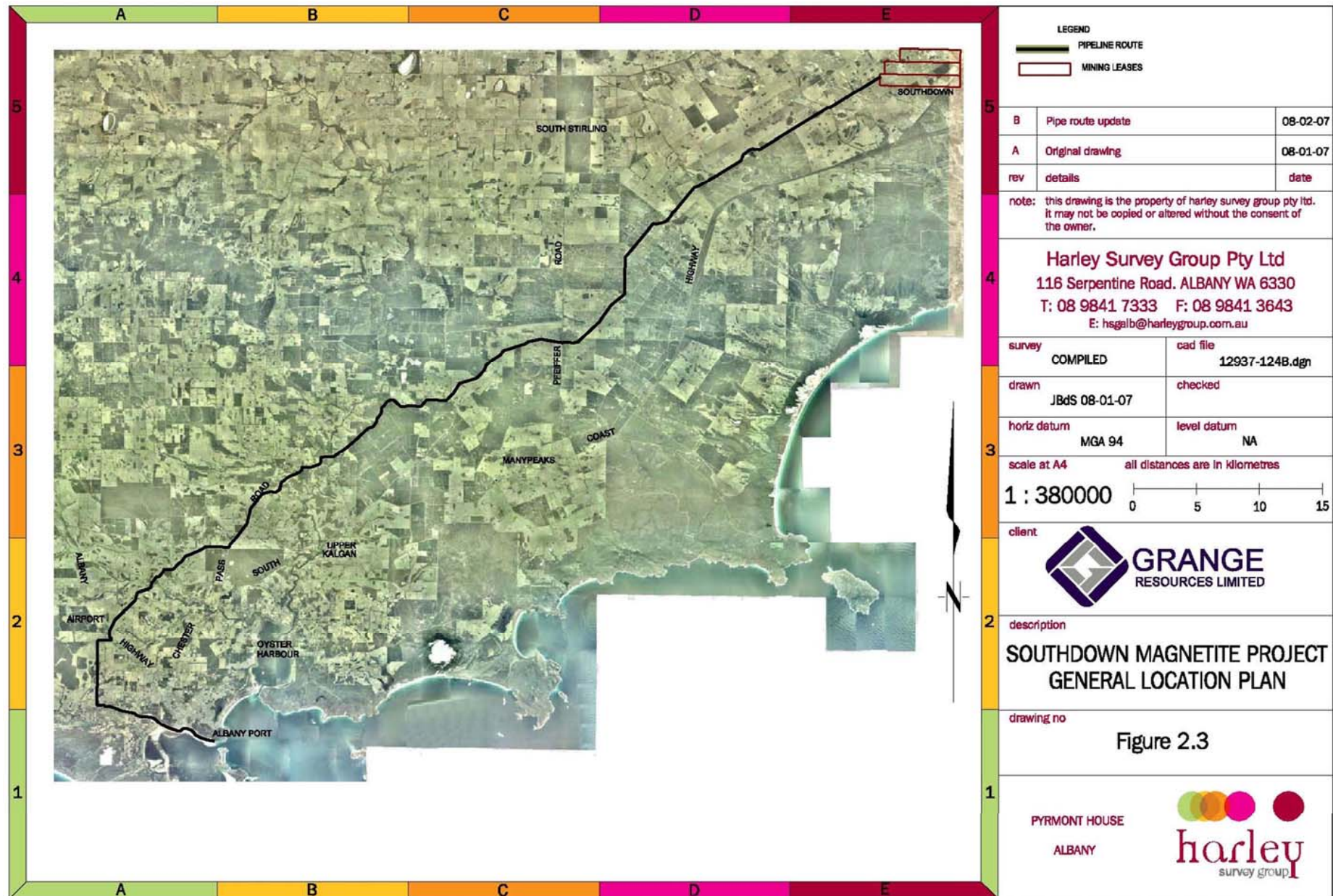


Figure 2: General location (Source: Figure 2.3 from ecologia Environment, 2007)



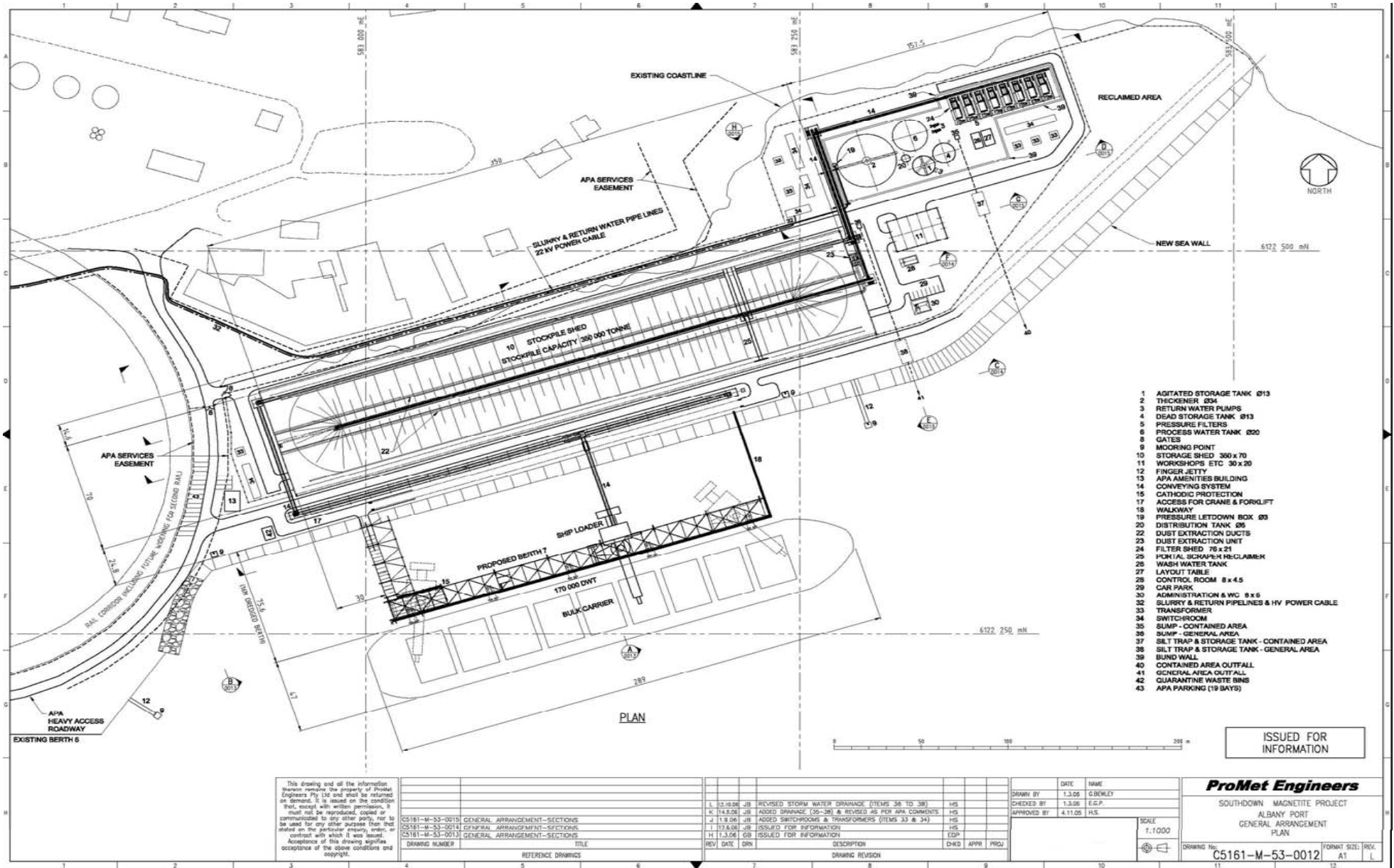


Figure 3: Albany Port general arrangement plan (Source: Figure 5.13 from ecologia Environment, 2007)

### **3. Key environmental factors and principles**

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

The identification process for the key factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as visual amenity and heritage issues, are relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

It is the EPA's opinion that the following key environmental factors for the proposal require detailed evaluation in this report:

- (a) Biodiversity;
- (b) Surface water and groundwater;
- (c) Dust;
- (d) Noise; and
- (e) Mine closure and rehabilitation.

The above key factors were identified from the EPA's consideration and review of all environmental factors generated from the PER document and the submissions received, in conjunction with the proposal characteristics.

Details on the key environmental factors and their assessment are contained in Sections 3.1 - 3.5. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

The following principles were considered by the EPA in relation to the proposal:

- (a) The precautionary principle;
- (b) The principle of intergenerational equity;
- (c) The principle of the conservation of biological diversity and ecological integrity;
- (d) Principles relating to improved valuation, pricing and incentive mechanisms; and
- (e) The principle of waste minimisation.



## 3.1 Biodiversity

### Description

#### *Flora and vegetation*

Around 85.2% of the proposed mine site footprint is cleared agricultural land or pine plantation. The remaining portion, (14.8%) is remnant native vegetation in 20 separate blocks. The 286.5 ha of remnant vegetation at the mine site represents about 2.8% of the total remaining vegetation (reserved and unreserved) of the East Sandplain sub-catchment which consists of 8,341 ha remnant vegetation cover and 684.7 ha in nature reserves (Connell and ATA Environmental 2001).

Approximately 252.6 ha of remnant vegetation would be cleared for mining activities over the 22 year life of the mine. However, a minimum of 30 ha of Albany Blackbutt (*Eucalyptus Staeri*) mallee heath vegetation would be retained for conservation purposes. The slurry and return water pipeline corridor would require the clearing of about 5 ha of native vegetation. The pipeline corridor does not traverse any conservation estate areas, and where possible, would be confined to existing firebreaks, open farm land, and access tracks.

The flora survey undertaken within the native vegetation proposed to be cleared for mine site development recorded 439 species (55 families) of vascular plants. The flora survey undertaken within the native vegetation proposed to be cleared in the pipeline corridor recorded 626 species (71 families) of vascular plants.

There are 41 species of threatened flora that are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) that are known to occur in the region. However, none of these species was recorded in the surveys undertaken for the proposed mine site or pipeline corridor. There were no Threatened Ecological Communities (TECs) recorded within the proposal area during the vegetation and flora surveys.

Eleven taxa of conservation significance were recorded during the vegetation surveys, of which seven taxa were recorded within the mine site and the pipeline corridor. The taxa *Commersonia* sp. Mt Groper which was found on the mine site was recently gazetted as a Declared Rare Flora taxon (Schedule 1) under the *Western Australian Wildlife Conservation Act 1950*.

The proponent expects that the surrounding groundwater dependent flora and vegetation is unlikely to be impacted by groundwater abstraction at the mine as the modelled drawdown cone is largely confined to the mining leases and adjacent farmland.

## *Fauna*

Clearing for the mine site and pipeline corridor will result in the loss of fauna habitat.

This proposal was determined to be a controlled action under the EPBC Act due to the presence of the Carnaby's Black Cockatoo and the Western Ringtail Possum.

Carnaby's Black Cockatoo is currently listed as Endangered under the EPBC Act and as Schedule 1 under the *Wildlife Conservation Act 1950*. The PER document indicated that the blocks of remnant vegetation within the proposed mine site do not provide any habitat that could facilitate breeding for any Black Cockatoo species as the trees are not large enough to provide nesting hollows, and kwongan heath is absent. Although some good foraging habitats are present within the proposed mine site, similar habitats can also be found outside the proposal area, such as in the Hassell National Park and the Stirling Range National Park. Two areas of remnant vegetation within the proposed pipeline corridor are likely to provide breeding habitat for Black Cockatoos. However, these two areas will not be cleared.

The Western Ringtail Possum is currently listed as Vulnerable under the EPBC Act. It is also listed as Schedule 1, Division 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2005 issued under section 14(2) (ba) of the *Wildlife Conservation Act 1950*. The PER document indicated that there is no suitable habitat within the proposed mine site that can support Western Ringtail Possums. There are three areas of remnant vegetation in proximity to the proposed pipeline corridor that could possibly provide habitat or refuges for Western Ringtail Possums. However, these areas would not be directly affected by pipeline construction.

There is potential for a variety of native fauna to become trapped in open pipeline trenches and fauna mortality may result if trapped fauna are not removed in a timely manner or through drowning in flooded trenches. The proponent's proposed management measures include keeping pipeline trench open times as short as possible, installing fauna refuge points, and having qualified persons clearing the trenches of trapped fauna.

### *Short-range endemic fauna*

A total of 91 short-range endemic (SRE) taxa were identified from survey sites within the proposed mine site and the pipeline corridor, and consisted of 10 Classes, 27 Orders, and 68 families of terrestrial and aquatic invertebrates. Arachnids were the most diverse group recorded with 4 Orders and up to 25 Families present. Mygalomorph spiders, pseudoscorpions, and Theridiidae spiders were found in 10%, 14.4%, and 18.9% of the survey sites, respectively. The Dipteran subfamily Chironominae were found at 13.3% of sites. Other groups that were recorded were mainly aquatic organisms such as mites (Acarina), diving beetles (Dytiscidae), and two families of 'true bugs' (Corixidae and Notonectidae).

### *Stygofauna*

Two stygofauna species of conservation significance were located within the modelled groundwater drawdown footprint of the mine. Syncarida -

*Parabathynellidae* sp. and *Bathynellidae* sp. 2 were found at a site located approximately 1.4 km north-west of the proposed mine site. The PER document indicated that groundwater modelling predicted that drawdown in the aquifer at this site would be approximately 0.5 m which is unlikely to have an impact on the conservation of these taxa given that the aquifer consists of fine grained Pallinup Siltstone that has a saturated thickness of least 8 m.

#### *Environmental offsets*

Since the proposal would result in unavoidable impacts on vegetation, the feeding habitat of Carnaby's Black Cockatoo, and biodiversity associated with the proposal, the proponent recognises that offsets will be required. The environmental offsets will be selected in accordance with EPA Position Statement No. 9 - Environmental Offsets and in consultation with the DEC. Offsets proposed include rehabilitation or restoration of an existing degraded ecosystem and the acquisition of land outside the project footprint which contains similar vegetation assemblages to the vegetation that will be cleared on the mine site.

#### **Submissions**

The main concerns raised in the submissions related to impacts on Priority flora, including *Commersonia* sp. Mt Groper which has recently been gazetted as DRF, remnant vegetation, and fauna including short-range endemic species and stygofauna, as well as rehabilitation, and the provision of suitable offsets.

#### **Assessment**

The area for assessment consists of the mine site and the pipeline corridor. The EPA's environmental objective for this factor is to:

- maintain the abundance, species diversity, geographic distribution and productivity of flora, vegetation communities, and fauna; and
- protect Declared Rare and Priority Flora, and Specially Protected (Threatened) and Priority Fauna consistent with provisions of the *Wildlife Conservation Act 1950*, and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

#### *Flora and vegetation*

The DEC advised that the vegetation units located on the mine site are adequately represented in areas outside the project footprint with the exception of the Priority 1 Ecological Community *Eucalyptus pleurocarpa* mallee heath on seasonally waterlogged alluvium, and recommended that offsets be pursued to counterbalance this impact.

Additional surveys were undertaken for *Commersonia* sp. Mt Groper after the release of the PER document to enable a better understanding of its regional distribution in areas outside the project footprint. The surveys indicated that there are four other populations of *Commersonia* sp. Mt Groper in surrounding regions. The EPA understands that mining would directly impact *Commersonia* sp. Mt Groper approximately 5 years after the commencement of operations.

The DEC advised that the:

- loss of the mine site population area would represent a significant reduction in the range of this species which, with climate change scenarios, could pose a significant risk to the species;
- mine site population is located in the largest area of intact native vegetation of any of the known sites, and also includes non-wetland vegetation, and therefore, it is likely to be the most viable of all the sites in the long term (proposed mining impacts excluded);
- mine site population is considered to be more significant for the conservation of this species than any of the other population sites, if it is appropriately conserved and managed; and
- loss of the mine site population could lead to the threat status of *Commersonia* sp. Mt Groper increasing to “Critically Endangered”.

The EPA considers that significant impacts on *Commersonia* sp. Mt Groper would be unacceptable. Accordingly, the EPA recommends that Condition 6 in Appendix 4 be imposed on the proponent to clearly delineate those areas on the mine site where *Commersonia* sp. Mt Groper is known or likely to occur, via comprehensive sets of AGM coordinates and a suitable figure, and to exclude these areas from mining activities and impacts from dewatering, until such time as a viable off-site population is established or located in secured reserve or a protected area such that the threat status of the species would not change from “Endangered” to “Critically Endangered”.

The EPA notes that groundwater dependent flora and vegetation surrounding the mine site is unlikely to be impacted by groundwater abstraction at the mine site.

#### *Fauna*

Although an area of the Carnaby’s Black Cockatoo’s foraging habitat would be removed, the EPA considers that impacts are unlikely given that similar foraging habitats are found outside the proposal area.

Similarly, the EPA notes that the Western Ringtail Possum is unlikely to be impacted by mine site and pipeline construction activities.

While the EPA notes the proponent’s management measures to reduce the potential for native fauna to be adversely impacted by open trenches associated with pipeline construction, the EPA considers this matter to be important enough to warrant a condition and has recommended that Condition 7 in Appendix 4 be imposed on the proponent. Condition 7 requires trapped fauna within open trenches to be cleared by a suitably trained person(s) during specified daily time periods.

#### *Short-range endemic fauna*

Following the release of the PER document, additional SRE surveys were undertaken to confirm the presence of *Bothriembryon* snail species (*Both.* Sp “Wellstead”), *Chenistonia* “*palludigena*” ms. nom. BYM (trap door spider family Nemesiidae), and

*Yilgarnia currycomboides* (trap door spider family Nemesiidae) outside the project footprint. With the exception of *Yilgarnia currycomboides*, it was confirmed that the other species occurred outside the project footprint. Although *Yilgarnia currycomboides* was not recorded during the surveys, it has been previously recorded at Peak Charles which is located approximately 300 km north-east of Wellstead. The EPA notes that mining would impact on one of only two known populations of *Yilgarnia currycomboides*, and that the DEC has recommended that offsets be pursued to counterbalance this impact and provide a net conservation benefit.

### *Stygofauna*

The EPA notes that the conservation significance of the two stygofauna species that were located within the modelled groundwater drawdown footprint of the mine is unlikely to be impacted by the predicted 0.5 m drawdown in the aquifer at this site.

### *Environmental offsets*

Implementation of the proposal would result in residual impacts on high value environmental assets. Accordingly, the EPA recommends that the proponent's offset package be defined and developed via negotiation with the DEC or other appropriate body and finalised prior to ministerial approval being granted for the proposal. The EPA also recommends that the proponent's offset package includes the acquisition of land containing, or likely to contain other populations of the:

- Priority 1 Ecological Community *Eucalyptus pleurocarpa* mallee heath on seasonally waterlogged alluvium; and
- SRE species *Yilgarnia currycomboides*.

### **Summary**

Having particular regard to the:

- (a) EPA's recommended conditions regarding the exclusion of mining activities from areas where *Commersonia* sp. Mt Groper is known, or likely to occur, and the clearing of fauna from trenches;
- (b) environmental management measures that would be used by the proponent to reduce the potential impacts on fauna from open pipeline trenches such as keeping trench open times as short as possible and installing fauna refuge points; and
- (c) advice received from the DEC;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

## **3.2 Surface water and groundwater**

### **Description**

The project requires approximately 2.7 gigalitres (GL) of water per year for construction activities, dust suppression, process plant operations, and slurry production. The proponent intends to obtain water from groundwater and rainfall surface run-off harvesting from the mine site. This alone would not provide sufficient

water for the proposal and the proponent is evaluating other options such as groundwater and rainfall surface run-off harvesting from adjacent catchments and wastewater from the Albany wastewater treatment facility.

Surface water catchments within the mine site are localised due to the undulating topography and do not significantly extend beyond the mine site boundary.

Groundwater beneath the proposed mine site currently flows in a south-easterly direction at a depth ranging from approximately 17 m to 27 m below the ground surface. Modelling indicates that the extent of groundwater drawdown at 22 years of mine life would be largely contained within the mining leases. Water within the drawdown cone would flow towards the mine pit. Although dewatering is expected to lower groundwater levels, they are expected to recover after mine closure. The section of the mine pit that is not backfilled is expected to form a pit lake.

Surface water and groundwater at the mine site may be impacted by the discharge of contaminated water into the surrounding environment, acid mine drainage and leachate from the waste rock dumps and the tailings storage facilities, and the disturbance to natural surface water and groundwater flow patterns from the mine pit. The proponent proposes to manage these potential impacts by:

- directing excess contaminated water resulting from significant rainfall events into the mine pit void for on-site management;
- pumping potentially contaminated groundwater obtained from within the drawdown cone on the mine site to a contaminated water storage facility to enable it to be used as process water;
- minimising the oxidation of potentially acid forming waste rock and tailings via encapsulation; and
- managing acid rock drainage by reducing the ingress of oxygen or the infiltration of water into, or through the waste rock storage facilities.

Surface water run-off from the port facility may be impacted by slurry and magnetite concentrate spillages and hydrocarbon and chemical spills. Process water from the port facility will not be released into the environment during operation. Surface water run-off overflow from the port facility drainage systems will be discharged into the marine environment. Gross pollutant traps or silt traps would be used in the port facility drainage systems to reduce the potential for impacts on the marine environment.

## **Submissions**

The main concerns raised in the submissions were:

- uncertainties in the modelling of groundwater flow at the mine site and the kinetic behaviour of the most sulphidic component of the waste rock stream;
- the potential impacts on surface water and groundwater from:
  - acid drainage from the waste rock and tailings storage facilities;
  - groundwater abstraction and water harvesting from adjacent catchments;

- the disturbance of acid sulphate soils during pipeline construction;
- pipeline failure; and
- contingency measures, monitoring, and management of surface water and groundwater.

### **Assessment**

The area for assessment consists of the mine site, pipeline corridor, and the port facility. The EPA's environmental objective for this factor is to maintain the quality of surface water and groundwater so that existing and potential uses, including ecosystem maintenance, are protected.

The EPA notes that there is insufficient water available for the proposal and that the proponent is considering other water sources including water harvesting from adjacent catchments, new groundwater borefields, and treated municipal wastewater from the Albany wastewater treatment facility. The EPA understands that the proponent is negotiating an option agreement with the Water Corporation to access this wastewater which would meet two thirds of the proposals' total water requirement. Should it become necessary for the proponent to obtain surface water and groundwater from adjacent catchments, the proponent would be expected to refer any significant proposal to the EPA.

The EPA expects that there will be no discharge of leachate or run-off from the waste rock dumps and tailings storage facilities. The proponent's proposed management measures to minimise the oxidation of potentially acid forming waste rock and tailings are considered to be adequate in terms of reducing the likelihood of leachate or run-off from the waste rock dumps and tailings storage facilities impacting on surface water and groundwater quality. However, the EPA considers that any discharge of water from the waste rock dumps and tailings storage facilities should be monitored, managed, and treated if necessary to ensure that surface water and groundwater quality are maintained. To ensure that leachate or run-off from the waste rock dumps and tailings storage facilities do not adversely affect surface water and groundwater quality, the EPA recommends that Condition 8 in Appendix 4 be imposed on the proponent.

The EPA considers that potential impacts from the discharge of run-off overflow from the port facility drainage systems can be adequately managed by the proponent's proposed management measures and appropriate Works Approval and Licence requirements under Part V of the *Environmental Protection Act 1986*.

### **Summary**

Having particular regard to the EPA's recommended conditions, it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

### 3.3 Dust

#### Description

##### *Mine site*

The following activities at the proposed mine site have the potential to generate dust:

- construction;
- blasting;
- excavation and stockpiling of waste rock;
- handling of magnetite ore on the run of mine stockpile;
- crushing and processing of the magnetite ore at the processing plant; and
- vehicle traffic movements on unsealed roads.

Modelled total suspended particulates (TSP) ground level concentrations (GLCs) at all surrounding conservation reserves are predicted to be well below the criteria applicable to human amenity (i.e. 15 minute limit of 1000  $\mu\text{g}/\text{m}^3$ , 24 hour limit of 150  $\mu\text{g}/\text{m}^3$ , and 24 hour standard of 90  $\mu\text{g}/\text{m}^3$ ).

There are no regulatory criteria for dust deposition in Western Australia. The PER document indicates that the Environmental Protection Authority in Queensland uses a guideline level for dust deposition of 4  $\text{g}/\text{m}^2/\text{month}$ . The proponent has used this criteria to derive an approximate daily value of 120  $\text{mg}/\text{m}^2/\text{day}$ . The deposition of TSP from mining activities is predicted to be well below the chosen criteria, and no adverse impacts are expected.

PM<sub>10</sub> GLCs in the vicinity of the mine site are predicted to be below the NEPM 24 hour standard of 50  $\mu\text{g}/\text{m}^3$  except at three nearby residential premises (Grasfeld, Beulah, and Nymann), which are located within 2 km of the mine site.

Dust suppression and management measures that would be used during mine construction and operation include the use of water tankers, staged vegetation clearing, and monitoring of dust levels.

##### *Pipelines*

Pipeline construction activities have the potential to generate dust during the relatively short construction period. The majority of dust suppression and management measures that would be used during mine construction and operation would also be used during pipeline construction. In addition, water sprays would also be used to suppress dust in extremely dry conditions.

##### *Port operations*

The potential for magnetite concentrate storage and ship loading activities at Albany Port to generate dust would be managed by enclosing all stockpile sheds and processing areas and maintaining concentrate moisture content. The ship loading activities would be subject to the Works Approval and Licence requirements of Part V



of the *Environmental Protection Act 1986*, and these regulatory tools could be used to control dust.

### **Submissions**

The main concerns raised in the submissions were:

- the lack of a dust emissions inventory for the mine site;
- the lack of discussion on dust deposition rates as well as the limitations of the modelling methodology that was used to estimate dust concentrations and dust deposition rates;
- apparent inconsistencies, uncertainties and gaps in the information that was provided in the regard to dust management measures;
- the possibility of the magnetite ore slurry and dust being carcinogenic, and the need for dust management at the port facility to be reconsidered by the proponent; and
- the need for dust monitoring at the mine site and port facility.

### **Assessment**

The area for assessment consists of the mine site, pipeline corridor, and the port facility. The EPA's environmental objective for this factor is to ensure that the dust levels generated by the proposal do not adversely impact upon welfare and amenity or cause health problems by meeting statutory requirements and acceptable standards.

Although the proponent proposes to use conventional dust suppression measures and management practices routinely employed by the mining industry at the mine site, the NEPM 24 hour standard for PM<sub>10</sub> is likely to be exceeded at the Grasfeld, Beulah, and Nymann premises. Accordingly, the EPA recommends that Condition 9 in Appendix 4 be imposed on the proponent.

Only short term impacts from dust from pipeline construction activities are expected due to the relatively short construction period. The conventional dust suppression measures and management practices that would be used by the proponent are considered to be adequate.

The EPA notes that the enclosure of all stockpile sheds, processing areas, shiploader conveyors along with maintaining the concentrate moisture content would minimise the potential for dust related impacts from the port facility. The EPA considers that potential dust impacts from ship loading activities can be adequately managed by the proponent's proposed management measures and requirements of the Works Approval and Licence required under Part V of the *Environmental Protection Act 1986*.

### **Summary**

Having particular regard to the environmental management measures that would be used by the proponent and the EPA's recommended condition, it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

## 3.4 Noise

### Description

#### *Mine site*

Construction and operation of the proposed mine would increase ambient noise levels in the surrounding areas. Noise would be generated by construction equipment, blasting, mobile plant, and the processing plant, and mine operations would be undertaken 24 hours per day.

Modelled noise levels from mining operations in the middle and eastern end of the proposed mine pit are predicted to exceed the *Environmental Protection (Noise) Regulations 1997*  $L_{A10}$  assigned level of 35 dB(A) at night at the three nearest residential premises (i.e. Grasfeld, Beulah, and Nymann). The proponent is negotiating with the owners to ensure that these premises would be unoccupied during mining.

#### *Pipelines*

Potential pipeline construction noise impacts in farmland areas will be managed via communication with the owners of the properties traversed by the pipeline corridor. Construction of the pipelines and associated land reclamation work along the northern shore of Princess Royal Harbour is predicted to increase noise levels in nearby residential and commercial premises above the assigned levels. As such, construction activities would need to be undertaken in accordance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997*.

#### *Port facility*

Construction of the port facility, which will include a concentrate thickener tank, filter plant, storage shed and ship loader, is predicted to result in noise impacts on nearby residential and commercial premises. The modelled noise level at the nearest residential premises is predicted to comply with the assigned level. However, the modelled noise level at the nearest commercial premises is predicted to exceed the assigned level, and as such, construction activities would need to be undertaken in accordance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997*.

Operation of the port facility will generate noise from motors, pumps, conveyors, and the ship loader. Noise levels generated by existing operations at the port exceed the assigned levels under the *Environmental Protection (Noise) Regulations 1997* at the nearest neighbouring premises. At the nearest residential premises the noise level is predicted to be 47.2 dB(A) which exceeds the applicable  $L_{A10}$  level of 45 dB(A). At the nearest industrial premises the noise level is predicted to be 60.7 dB(A) which is below the applicable  $L_{A10}$  level of 65 dB(A).

## Submissions

The DEC expressed concern about the simplified noise modelling that was undertaken for the mine site and the port facility as well as the general lack of useful information in the PER document to enable a proper technical assessment to be made. The DEC raised specific concerns about the predicted noise levels and the adequacy of the proposed management measures.

## Assessment

The area for assessment consists of the mine site, pipeline corridor, and the port facility. The EPA's environmental objective for this factor is to protect the amenity of nearby residents from noise impacts resulting from activities associated with the proposal by ensuring the noise levels meet statutory requirements and acceptable standards.

The EPA notes that mining operations in the middle and eastern sections of the proposed mine pit are predicted to result in the exceedance of the  $L_{A10}$  assigned level of 35 dB(A) at night at the three nearest residential premises (i.e. Grasfeld, Beulah, and Nymann). Accordingly, the proponent would need to implement appropriate management measures to ensure that the *Environmental Protection (Noise) Regulations 1997* are not breached at these premises.

Noise levels from pipeline and port facility construction and reclamation activities along the northern shore of Princess Royal Harbour are predicted to exceed applicable  $L_{A10}$  levels at the nearest residential and commercial premises. The EPA notes that these construction activities would thus need to be undertaken in accordance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997*. Regulation 13 places obligations on the proponent to carry out activities in accordance with the requirements set out in Section 6 of Australian Standard 2436-1981. These obligations include using the quietest equipment which is reasonably available, undertaking construction activities between 7:00 am and 7:00 pm on any day except Sundays and public holidays, and preparing a noise management plan if construction activities will be undertaken outside these times.

In response to the DEC's concerns, the proponent provided a supplementary noise assessment for operations at the proposed port facility. The EPA notes that all major pumps and motors within the port facility are now proposed to be enclosed. As a result, the predicted noise level at the nearest residential premises is now 40.1 dB(A) which is below the assigned level of 47 dB(A), and the predicted noise level at the nearest industrial premises is now 54.2 dB(A) which is below the assigned level of 65 dB(A).

Based on this supplementary modelling, the DEC has advised that noise emissions from operations at the proposed port facility would not significantly contribute to existing noise levels at the nearest noise sensitive premises, and can be managed to comply with the *Environmental Protection (Noise) Regulations 1997*.

## Summary

Having particular regard to the:

- (a) proponent's undertaking to ensure that the Grasfeld, Beulah and Nymann premises are not occupied throughout mine site operations;
- (b) environmental management measures that would be used by the proponent;
- (c) advice received from the DEC on the supplementary noise assessment; and
- (d) results obtained from the supplementary noise assessment for operations at the proposed port facility;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

## 3.5 Mine closure and rehabilitation

### Description

Open cut mining will be used to mine the Southdown Magnetite Deposit. The proposed mine is anticipated to have a minimum life of 22 years.

The proposed mine pit will have a footprint of approximately 400 ha, a strike length of 6 km, and depth of 300 m. A mine pit void will remain after mining operations cease.

Tailings from the first six years of production will be stored in an external tailings storage facility. In following years tailings will be directed back to the mine pit as backfill. In its final configuration, the external tailings storage facility will cover an area of approximately 370 ha to a maximum height of about 40 m above the existing natural ground level.

Waste rock from the first four years of production will be stored in an external waste rock dump. From the fifth year of production onwards approximately half of the waste rock would be backfilled into the mine pit void with the rest stored in the external waste rock dump. In its final configuration, the external waste rock dump will cover an area of approximately 620 ha to a height of 45 m above the existing natural ground level.

The proponent has prepared a conceptual closure plan for the mine to comply with the *AMEC Mine Closure Guidelines 2000* and the *ANZMEC/MCA Strategic Framework for Mine Closure 2000* with the view to returning the mine site to a self sustaining ecosystem that is consistent as far as possible with the natural surrounding environment.

Decommissioning will involve the dismantling and removal of infrastructure, the appropriate disposal of waste materials, and the return of impacted areas to a range of vegetation types and fauna habitats that reflect their original condition as closely as possible.

Rehabilitation will be undertaken progressively where possible as disturbed areas become available, and for portions of the tailings storage facility, waste rock dump and other impacted areas, will commence as early as possible in the mining phase.

Rehabilitation will include ripping of areas that have become compacted, re-establishment of a stable landform with erosion protection, replacement of topsoil, and spreading of vegetation debris to return organic matter and provide an additional seed source.

Management measures for rehabilitation will include appropriate closure criteria, procedures for monitoring, the use of appropriate vegetation species to establish feeding habitat for Carnaby's Black Cockatoo, the use of native flora species of local provenance, and efforts to re-establish Priority Flora.

### **Submissions**

The main concerns raised in the submissions related to the:

- predicted long term effects that the decommissioned and rehabilitated landscape may have on surface water, groundwater, and the surrounding landscape not being apparent in the PER document; and
- need for the proponent to use up to date standards and documents for closure planning for the proposal.

### **Assessment**

The area for assessment consists of the mine site. The EPA's environmental objective for this factor is ensure that:

- rehabilitation and mine closure planning are carried out in a coordinated, progressive manner and are treated as an integral part of mine development, consistent with the ANZMEC/MCA *Strategic Framework for Mine Closure 2000*, and best practice; and
- as far as practicable, rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental values.

In order to ensure the long term success of mine closure and rehabilitation the EPA recommends that Condition 10 in Appendix 4 be imposed on the proponent.

The EPA notes that a mine pit void will remain when mining operations cease and that the potential exists for a pit lake to form within the remaining mine pit void when mining and dewatering operations cease. Pit lakes have the potential to impact on groundwater and attract fauna which may subsequently be harmed, or which may harm surrounding native vegetation. Accordingly, recommended Condition 10 referred to above also includes a requirement that the proponent ensures that the final pit void does not pose a risk to groundwater, fauna, or native vegetation.

## Summary

Having particular regard to the EPA's recommended condition, it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

### 3.6 Environmental principles

In preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the *Environmental Protection Act 1986*. Appendix 3 contains a summary of the EPA's consideration of the principles.

## 4. Conditions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

### 4.1 Recommended conditions

The EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by Grange Resources Limited to construct and operate a magnetite mine located approximately 90 km east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which will include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels, is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

- (a) the prevention of impacts on *Commersonia* sp. Mt Groper on the mine site;
- (b) the clearing of trapped fauna within open pipeline trenches by a suitably trained person(s) during specified daily time periods;
- (c) monitoring and management of leachate or run-off from the waste rock dumps and tailings storage facilities so that they do not adversely affect surface water and groundwater quality;
- (d) dust monitoring and management at the mine site; and
- (e) mine closure and rehabilitation.

It should be noted that other regulatory mechanisms relevant to the proposal are:

- Part V of the *Environmental Protection Act 1986* - various Works Approvals and an operating licence would be required for construction and operation of the project;
- *Right in Water and Irrigation Act 1914* - water licenses and bed and banks permits will be required from the Department of Water for the project area and borefields; and

- *Mining Act 1978* - a mining proposal will be required to be approved by the Department of Industry and Resources.

## **5. Other advice**

### *Greenhouse gas emissions*

The proponent should manage greenhouse gas emissions from the proposal (approximately 750,000 tpa) in a manner that is consistent with the relevant policies and initiatives outlined in the Premier's Climate Change Action Statement (May 2007).

### *Disturbance of contaminated sites*

Contaminated site investigations undertaken by the proponent identified two contaminated sites in the Albany area that would be traversed by the pipeline corridor. These are the existing train refuelling facility and former rail depot, and the former City of Albany landfill and associated maintenance shed. The proponent would be required to ensure that all pipeline related excavation and construction activities comply with the requirements of the *Contaminated Sites Act 2003* and the *Contaminated Sites Regulations 2006*, which are administered by the DEC.

## **6. Conclusions**

The EPA has considered the proposal by Grange Resources Limited to construct and operate a magnetite mine located approximately 90 km east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which will include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels.

The EPA has determined that the key environmental factors relevant to the proposal were biodiversity, surface water and groundwater, dust, noise, and mine closure and rehabilitation. Flora and vegetation, fauna, short-range endemic fauna, stygofauna and environmental offsets were considered by the EPA under the factor of biodiversity.

The EPA has recommended that conditions be imposed on the proponent in relation to:

- the prevention of impacts on *Commersonia* sp. Mt Groper on the mine site;
- the clearing of trapped fauna within open pipeline trenches by a suitably trained person(s) during specified daily time periods;
- monitoring and management of leachate or run-off from the waste rock dumps and tailings storage facilities;
- dust monitoring and management at the mine site; and
- mine closure and rehabilitation.

The EPA has also recommended that the proponent's offset package be defined and developed via negotiation with the DEC or other appropriate body and finalised prior to ministerial approval being granted for the proposal, and that it includes the acquisition of land containing, or likely to contain other populations of the:

- Priority 1 Ecological Community *Eucalyptus pleurocarpa* mallee heath on seasonally waterlogged alluvium; and
- SRE species *Yilgarnia currycomboides*.

The EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4 and summarised in Section 4.

## 7. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for Grange Resources Limited to construct and operate a magnetite mine located approximately 90 km east-north-east of Albany, slurry and return water pipelines connecting the mine site and a new port facility at Albany Port which would include a concentrate thickener tank, filter plant, storage shed, and ship loader, and to ship the magnetite concentrate on Cape size vessels;
2. That the Minister considers the report on the key environmental factors and principles as set out in Section 3;
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments; and
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.



# **Appendix 1**

## **List of submitters**

**Organisations:**

1. Conservation Council of Western Australia Inc.
2. Department of Agriculture and Food WA.
3. Department of Environment and Conservation.
4. Department of Health.
5. Department of Indigenous Affairs.
6. Department of Planning and Infrastructure.
7. Department of Water.
8. Heritage Council of Western Australia.
9. Wellstead Progress Association Inc.
10. Western Australian Museum.
11. Wildflower Society of Western Australia (Inc).

**Individuals:**

1. Mr Neil R. Smithson.
2. Mr Paul Sanford.
3. Mrs Jennifer Lucas.

# **Appendix 2**

## **References**

Connell and ATA Environmental (2001). *Vegetation survey of the Albany Hinterland*. Unpublished report for the City of Albany and the Natural Heritage Trust.

ecologia Environment (2007). *Albany Iron Ore Project Public Environmental Review - Southdown Magnetite Proposal*. Prepared by ecologia Environment for Grange Resources Limited, February 2007.

Grange Resources Limited (2008). *Letter from Grange Resources Limited to EPA Service Unit dated 29 May 2008*.

## **Appendix 3**

**Summary of identification of key environmental factors and principles**

| Preliminary Environmental Factors  | Proposal Characteristics  | Government Agency and Public Comments Received During the Public Review Period  | Identification of Key Environmental Factors   |
|------------------------------------|---|---|---|
| <b>BIOPHYSICAL</b>                 |   |   |   |
| <p><b>Flora and vegetation</b></p> | <p><i>Flora and vegetation</i></p> <p>Around 85.2% of the proposed mine site footprint is cleared agricultural land or pine plantation. The remaining portion, (14.8%) is remnant native vegetation in 20 separate blocks. The 286.5 ha of remnant vegetation at the mine site represents about 2.8% of the total remaining vegetation (reserved and unreserved) of the East Sandplain sub-catchment which consists of 8,341 ha remnant vegetation cover and 684.7 ha in nature reserves (Connell and ATA Environmental 2001).</p> <p>Approximately 252.6 ha of remnant vegetation would be cleared for mining activities over the 22 year life of the mine. However, a minimum of 30 ha of Albany Blackbutt (<i>Eucalyptus Staeri</i>) mallee heath vegetation would be retained for conservation purposes. The slurry and return water pipeline corridor would require the clearing of about 5 ha of native vegetation. The pipeline corridor does not traverse any conservation estate areas, and where possible, would be confined to existing firebreaks, open farm land, and access tracks.</p> <p>The flora survey undertaken within the native vegetation proposed to be cleared for mine site development recorded 439 species (55 families) of vascular plants. The flora survey undertaken within the native vegetation proposed to be cleared in the pipeline corridor recorded 626 species (71 families) of vascular plants.</p> <p>There are 41 species of threatened flora that are listed under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (the EPBC Act 1999) that are known to occur in the region. However, none of these species was recorded in the surveys undertaken for the proposed mine site or pipeline corridor. There were no Threatened Ecological Communities (TECs) recorded within the proposal area during the vegetation and flora surveys.</p> <p>Eleven taxa of conservation significance were recorded during the vegetation surveys, of which seven taxa were recorded within the mine site and the pipeline corridor. The taxa <i>Commersonia</i> sp. Mt Groper which was found on the mine site was recently gazetted as a Declared Rare Flora taxon (Schedule 1) under the <i>Western Australian Wildlife Conservation Act 1950</i>.</p> <p>The proponent expects that the surrounding groundwater dependent flora and vegetation is unlikely to be impacted by groundwater abstraction at the mine as the modelled drawdown cone is largely confined to the mining leases and adjacent farmland.</p> <p><i>Environmental offsets</i></p> <p>Since the proposal would result in unavoidable impacts on vegetation, the feeding habitat of Carnaby's Black Cockatoo, and biodiversity associated with the proposal the proponent recognises that offsets will be required.</p> | <p><b>Department of Environment and Conservation (Environmental Management Branch)</b></p> <ol style="list-style-type: none"> <li>Information presented to date confirms that areas of vegetation on the mine site described as being in good to excellent condition are considered to be of very high conservation significance in a regional context. The very high conservation significance of the remnant vegetation at the mine site that is proposed to be cleared should be taken into account in the evaluation of this proposal.</li> </ol> <p>DEC is unable to provide a complete assessment of the conservation significance of the vegetation units or plant assemblages mapped in the project area because a comprehensive regional dataset on the ecological values and current extent, distribution and condition of these assemblages in the region does not exist.</p> <p>In October 2006 the proponent undertook a further field reconnaissance survey of relevant nature reserves and other remnant bushland (beyond the immediate footprint of the Southdown Magnetite project) on the Pallinup Sandplain between the Kalgan and Pallinup Rivers, south of the Stirling Ranges. Information from this survey has not yet been provided to the Department, however this report should clarify the regional distribution of vegetation units, provide information to support a better understanding of the significance of plant assemblages of the mine site and pipeline route in the regional context, and facilitate evaluation of the potential impacts of the proposal on their conservation status. The report may also provide information that could support recommendations as to whether any of the vegetation units should be considered for listing as Priority or Threatened Ecological Communities.</p> <ol style="list-style-type: none"> <li>The Albany Hinterland Vegetation Inventory (referred to on pg 125 of the PER) is considered to be a very coarse level data reference source, particularly in relation to vegetation type descriptions. The paucity of reliable data on vegetation communities east of Albany and in the Wellstead area should be noted in the PER.</li> <li>Should the proposal be approved, DEC recommends that further exploration for extant populations of <i>Commersonia</i> sp. Mt Groper in the Wellstead region be undertaken. The Department understands that the proposed timing of the clearing of the <i>Commersonia</i> sp. Mt Groper is 10-15 years after project commencement. A recovery plan for this species should be developed in consultation with DEC, and satisfactorily implemented to meet predefined objectives prior to disturbance of the two wetlands on the mine site that support suitable habitat for this species. These two wetlands should be managed carefully in the interim to increase the chances of germplasm recovery from these sites should this become necessary. Stock currently grazing in the wetland close to the current mine site office should be excluded from the wetland as soon as possible and prior to project commencement.</li> </ol> <p>Information quantifying the impact of the proposal on each population of priority flora species at the mine site and the size and extent of other populations in the local area and region (as appropriate) is required to enable informed assessment of the significance of project impacts.</p> <ol style="list-style-type: none"> <li>Regional surveys are considered necessary to confirm the conservation status of</li> </ol> | <p>In view of the nature of the concerns that were raised in the comments that were received, the EPA considers that flora and vegetation and environmental offsets are relevant environmental factors. Flora and vegetation and environmental offsets will be considered under the factor of biodiversity. The EPA considers that the proponent's proposed dieback management measures are adequate. In view of the above, the EPA considers that dieback does not require further evaluation.</p> |

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|                                   | <p>The environmental offsets will be selected in accordance with EPA Position Statement No. 9 - Environmental Offsets and in consultation with the DEC. Offsets proposed include rehabilitation or restoration of an existing degraded ecosystem and the acquisition of land outside the project footprint which contains similar vegetation assemblages to the vegetation that will be cleared on the mine site.</p> <p><i>Dieback</i></p> <p>The PER document indicated that it is assumed that the proposal footprint consists of both dieback infected and dieback free vegetation. The PER document also indicated that as dieback mapping is only valid for one year prior to ground disturbing activities, a dieback disease assessment of the proposed mine site and pipeline corridor will be undertaken within one year of any ground disturbing activities occurring. The proponent's dieback management measures will be developed in consultation with the DEC and other authorities. These measures will include the provision and use of clean down facilities and ensuring that earth moving equipment is free of dirt and plant material prior to entry and exit of sensitive and/or dieback quarantine areas.</p> | <p>Priority flora species listed on pg 145 - <i>Monotoca arista</i> (P2) <i>Chordiflex leucoblepharus</i> (P2), <i>Microcorys lenticularis</i> (P2), <i>Calectasia obtusa</i> (P3) and <i>Dryandra calophylla</i> (P3) and may be regarded as a useful contribution to conservation of threatened flora in the local region. These surveys should be documented in the Threatened Flora and Conservation Management Plan.</p> <ol style="list-style-type: none"> <li>5. The proponent has indicated it is committed to retaining a minimum of 30 ha of Albany Blackbutt (<i>Eucalyptus staeri</i>) mallee heath and chittick scrub-heath (pg 257). The current status and location of this vegetation is not mentioned in the PER. DEC requires information describing the location, floristic structure and composition of this vegetation and what measures Grange will be employing to protect this vegetation from the impacts of mining in close proximity. This area needs to be identified as soon as possible and actions taken to protect it from uncontrolled access, Phytophthora dieback and other detrimental impacts. This assessment should also incorporate a Phytophthora dieback assessment of this vegetation.</li> <li>6. The avoidance of impacts to "Priority flora or Conservation Significance" (pg 258) is included as a management strategy, however the implementation of this strategy is not described in sufficient detail, hence there is no information available to evaluate this potential management strategy. DEC recommends an aerial photograph be produced that is overlain with mine site vegetation units, population boundaries of Priority flora, the Albany Blackbutt conservation area, remnant vegetation within the mining lease not proposed to be disturbed, proposed pit outline, waste dump, tailings storage facility and other infrastructure. This will provide the Department with an indication of vegetation (primarily Priority flora and significant vegetation communities) avoidance and disturbance minimisation measures.</li> <li>7. The proponent is proposing a Threatened Flora and Conservation Management Plan (pg 258) as a management strategy to address threatened flora impacted by the proposal. It is unclear how a plan of this nature will address or mitigate impacts of the proposal and an outline of the key actions and objectives of this plan should be provided for decision-makers.</li> <li>8. The occurrence of <i>Cephalotus follicularis</i> (Technical Appendix 13.8, pg 253) at the Kratochvill wetland is of conservation significance and additional information is required on the disturbance to this species' habitat from pipeline construction, what efforts the proponent will make to minimise impact, and what the proposed impact to this population would be.</li> <li>9. Technical Appendix 13.8, pg 253 states "<i>Lepidosperma viscidum</i> [sic] recorded at the Parker Brook Reserve along the originally proposed pipeline route is potentially a new species as it does not conform well to the current circumscription of <i>Lepidosperma viscidum</i> (E. Sandiford, pers. comm.)." Further collections and subsequent identification of this species are required. DEC requires information on the level of disturbance to this population.</li> <li>10. Comment is unable to be provided on taxa at the extremes of their range, recently discovered range extensions, or isolated outliers from the main range (refer Technical Appendix 13.8 pg 254), without contextual information about the distribution of these species. This warrants further survey effort through the inclusion of these taxa in the regional survey program that DEC has recommended</li> </ol> |   |

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|                                   |                          | <p>be included in the Threatened Flora and Conservation Management Plan. Species included include <i>Hibbertia hibernoides</i> var. <i>meridionalis</i>, <i>Urticularia simplex</i>, <i>Banksia nutans</i> var. <i>nutans</i>, <i>Hakea baxteri</i>, <i>Stylidium caespitosum</i>, <i>Eremaea pauciflora</i> var. <i>pauciflora</i>.</p> <p>11. The species <i>Caladenia fuscolutescens</i> and <i>Chordifex capillaceus</i> appear to warrant listing as Priority 1 or 2 flora due to their restricted distribution (Technical Appendix 13.8, pg 256). Further advice from <i>Ecologia</i> is requested regarding these proposed additions to the Priority flora list.</p> <p>12. While <i>Adenanthos apiculatus</i> is restricted and Phytophthora dieback susceptible (Technical Appendix 13.8, pg 256), it is locally abundant (e.g. in Waychinicup National Park and Stirling Range National Park). Its status should be monitored over time as it occurs on Phytophthora dieback prone habitat.</p> <p>13. <i>Cyperochloa hirsuta</i> has a broader range than stated (Technical Appendix 13.8, pg 256) but its habitat may be degraded (Yate swamps) as noted by <i>Ecologia</i>. DEC seeks clarification on this.</p> <p>14. <i>Schoenus multiglumis</i>, <i>Andersonia depressa</i>, and <i>Drosera dichrosepala</i> have narrow ranges (Technical Appendix 13.8, pg 256), however it is unclear as to whether these species will be impacted by the pipeline. DEC seeks clarification on this.</p> <p>15. <i>Banksia dryandroides</i> is Phytophthora dieback susceptible. Its status should be monitored over time as it occurs in Phytophthora dieback prone (low-lying, seasonally moist) habitat. The community (or communities) in which <i>B. dryandroides</i> occurs could be potentially threatened also and DEC seeks information to clarify the conservation of this community.</p> <p>16. <i>Leucopogon elegans</i> has 44 records on Florabase, so it is likely to be locally abundant, e.g. Cape Riche. <i>Leucopogon corynocarpus</i> is locally abundant in Stirling Range National Park and Fitzgerald River National Park.</p> <p><b>Department of Environment and Conservation (Ecological Systems Branch)</b></p> <p>1. The PER states that “no DRF were recorded in the project footprint... a total of 11 taxa of conservation significance were recorded during the surveys” (page 144). These species appear in Table 5.2 (page 69), with an indication of percentages of the population of each that are expected to be impacted by the proposal. This table should be updated to indicate the estimated percentage of the known populations that occur in reserves/secure conservation areas, particularly considering the relatively large proportions of some of these species that are expected to be impacted by the proposal; e.g. <i>Commersonia</i> sp. Mt Groper - 33%, <i>Monotoca aristata</i> - 20%, <i>Calectasia obtusa</i> - 18%, <i>Chordifex leucoblepharus</i> - 15% and <i>Goodenia filiformis</i> - 12%, before acceptability of the loss of these proportions of these species and several other species can be considered.</p> <p>In addition to the large number of Priority species to be impacted by the proposal, there are numerous significant species listed in Appendix E of the flora and vegetation report, the management of which doesn't appear to have been addressed in the PER, and it is unclear whether impacts to these species can be adequately</p> |   |



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|                                   |                          | <p>managed.</p> <p>2. As stated in the flora and vegetation technical report (page 83), and the PER, “The 20.6% total remnant vegetation in the three sub-catchments falls below (on total vegetation measures, let alone individual vegetation units or ecosystems that might have been present) the threshold level of 30% below which species loss is considered to accelerate exponentially at the ecosystem level (Environmental Protection Authority, 2000)”. Hence, the significance of the vegetation to be impacted by this proposal is clearly high.</p> <p>3. The Flora and Vegetation Technical Report shows that further searching for the previously Rare, currently Priority 1 species <i>Commersonia</i> sp. Mt Groper was undertaken in March and October 2006, and that ‘an extensive search by <i>ecologia</i> in October 2006 found a single small (50 to 100 plants) population of <i>Commersonia</i> sp. Mt Groper in an unprotected location outside the mine and pipeline footprint. Further exploration to determine any additional extant populations and the development of a recovery plan for this species (in consultation with the WA Threatened Species and Communities Unit of DEC) is recommended.’ Further targeted surveys for this species and propagation and management of this species in combination with DEC, Kings Park and Botanic Gardens, Threatened Flora Seed Centre and UWA are supported.</p> <p><b>Wildflower Society of Western Australia (Inc)</b></p> <p>1. Seven priority flora will be impacted by the mine. One of these <i>Commersonia</i> sp. Mt Groper (RG Cranfield &amp; D. Kabay 9157) would probably be declared flora but it has not been processed completely by the Department of Environment and Conservation. The commitments given should be made ministerial conditions. We wish to mention Ministerial Statement 627 which related to Portman Mining which has established a baseline for the management of flora and the contributions expected of proponents towards their conservation. This was made in 2003 and we believe with this statement and the EPA bulletin 1242 Mt Gibson Iron Ore and Infrastructure Project the bar has been raised and the proponent in this instance should be making far greater efforts to minimise the effects on the environment and the protection of significant areas. We would be happy to provide further details particularly in relation to the Portman situation.</p> <p>With significant flora we note the location of the <i>Commersonia</i> sp. Mt Groper (RG Cranfield &amp; D. Kabay 9157) and believe the area it occurs should not be included in the mine and sufficient buffer be retained around it. This should at least be the case until the conservation status and the appropriate management of the species can be determined.</p> <p>2. About 14.85 ha of the mine site is remnant vegetation and less than 30% of this type of vegetation remains in the region. In addition only 4.6% of the original vegetation of the region is in a reserve. As much as possible of the site vegetation should be protected. The site should only be progressively cleared as the mine is developed. This should be detailed in the management plan and be a ministerial condition.</p> <p>The project proposes clearing 252.6 ha of native vegetation yet Grange Resources is only proposing to “conserve” 30 ha. This is grossly inadequate. Whilst the Society</p> |   |

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|                                   |                          | <p>does not support the clearing of native vegetation for this project we recognise there is a likelihood of the project being allowed in some form. As a consequence the company should be arranging to purchase an equivalent area of high quality vegetation for vesting in the conservation estate. This should be a ministerial condition. From our experience this process can be frustrated by a number of agencies and the agreement of all decision making authorities and ministers should be obtained for this to be completed before any ground disturbing works are allowed. It has been our experience that promises made are broken once work proceeds. We cite as a specific example the commitment to extend the Mount Manning Nature Reserve as part of the Portman Mining approval process.</p> <p>Any revegetation works is a legal requirement following mining. It will be impossible to replace what is lost so the company should not be seeing this work as in some way contributing to a 'net environmental outcome'.</p> <p><b>Conservation Council of Western Australia Inc</b></p> <p>1. It is unlikely that the clearing of native vegetation for this proposal will meet the Native Vegetation Clearing Principles given that:</p> <ul style="list-style-type: none"> <li>• Only about 14.85 ha of the mine site is remnant vegetation and less than 30% of this type of vegetation remains in the region of which only 4.6% is in a reserve;</li> <li>• Some of the vegetation is Yates vegetation, i.e. associated with a wetland; and</li> <li>• The vegetation supports a high level of biological diversity, including a number of species of threatened fauna.</li> </ul> <p>Thus the clearing should not go ahead for this proposal. However, if the principles are to be overruled and clearing is allowed, then all of this clearing must be directly offset by the purchase or restoration and protection of equivalent areas of the same vegetation types that are otherwise threatened in the local area. Given the importance of remnant vegetation in this heavily cleared area and the risk of loss of biodiversity, the proponent should also be required to provide a greater than 1:1 offset ratio.</p> <p>Any offsets must be in place before clearing commences.</p> <p>Revegetation work following mining is not considered an offset for clearing, especially given concerns about acidic tailings in the revegetation area.</p> <p>It is disappointing to see no concrete commitments relating to offsets in the PER proposal for the community to comment on. There is a need to improve the transparency and integrity of offsets if this controversial tool is to be accepted by all stakeholders.</p> <p>2. The fact that no priority weeds were recorded at the mine site adds to the significance of the site and should be considered in assessment, and if necessary in determination of offsets. Any offset sites should have these weeds removed by the proponent.</p> |   |

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|                                   |  | <p>3. Seven priority flora will be impacted by the mine. According to the Wildflower Society of Western Australia one of these, <i>Commersonia sp. Mt Groper</i> (RG Cranfield &amp; D. Kabay 9157) would be processed by the DEC to become DRF. As such, the species should be avoided as though it had already been declared as DRF.</p> <p>All commitments to protect rare and priority flora need to be made legally enforceable; remembering especially that rare flora could at anytime become DRF due to unforeseen circumstances. Unfortunately this remains more likely than the opposite, i.e. being removed from the priority list.</p> <p>Recent approvals for mines with rare flora issues such as Portman and Mt Gibson should be referenced for the "precedent" that has been created when dealing with these issues.</p> <p>4. The failure to provide a dieback survey and risk assessment in the PER is a critical error on behalf of the proponent. This information is vital to the communities' ability to understand the range of impacts of the project. Deferral to a management plan and future studies is not acceptable for a critical issues (for remnant vegetation) during the PER process.</p> <p>5. Pipeline Reclamation: The source of rock armour and fill for the reclamation area has not been stated. What are the impacts of (presumably ) quarrying for this material? These may be significant for increasingly threatened remnant bush in the Albany area.</p> <p><b>Public</b></p> <p>1. It is very doubtful if rehabilitation on disturbed areas will ever be properly produced to its former growth, particularly so where large trees have to be removed in order to lay the slurry pipes.</p> <p>These trees have taken centuries to grow and some of them are of course habitats for various species of birds into which nest in them, or live off the nuts or blossoms etc.</p> <p>2. There are a number of small areas of remnant vegetation at the proposed mine site, its likely that if these are not currently degraded they will become so in the future as a consequence of their size. However, the two largest areas of native vegetation appear to be viable and in my opinion should not be cleared. I base my opinion on two facts firstly its most unlikely the people who farmed this land would have been given a license to clear this remnant vegetation due to land degradation risk and the high percentage of cleared land in the area so why should Grange Resources? Secondly it's my understanding that few studies of the Wellstead native flora and fauna have been undertaken and as such clearing of native vegetation could risk the loss of rare and endangered species.</p> <p>If the project goes ahead it should be a condition of the licensee that the two largest areas of native vegetation not be cleared.</p> |   |
| Fauna                             | <p><i>Fauna</i></p> <p>Clearing for the mine site and pipeline corridor will result in the loss of</p> | <p><b>Department of Environment and Conservation (Environmental Management Branch)</b></p>   | <p>In view of the nature of the concerns that were raised in the comments that were</p> |

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|                                   | <p>fauna habitat.</p> <p>This proposal was determined to be a controlled action under the <i>EPBC Act</i> due to the presence of the Carnaby's Black Cockatoo and the Western Ringtail Possum.</p> <p>Carnaby's Black Cockatoo is currently listed as Endangered under the <i>EPBC Act</i> and as Schedule 1 under the <i>Wildlife Conservation Act 1950</i>. The blocks of remnant vegetation within the proposed mine site do not provide any habitat that could facilitate breeding for any Black Cockatoo species as the trees are not large enough to provide nesting hollows, and kwongan heath is absent. Although some good foraging habitats are present within the proposed mine site, similar habitats can also be found outside the proposal area, such as in the Hassell National Park and the Stirling Range National Park. Two areas of remnant vegetation within the proposed pipeline corridor are likely to provide breeding habitat for Black Cockatoos. However, these two areas will not be cleared.</p> <p>The Western Ringtail Possum is currently listed as Vulnerable under the <i>EPBC Act</i>. It is also listed as Schedule 1, Division 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2005 issued under section 14(2) (ba) of the <i>Wildlife Conservation Act 1950</i>. There is no suitable habitat within the proposed mine site that can support Western Ringtail Possums. There are three areas of remnant vegetation in proximity to the proposed pipeline corridor that could possibly provide habitat or refuges for Western Ringtail Possums. However, these areas would not be directly affected by pipeline construction.</p> <p>There is potential for a variety of native fauna to become trapped in open pipeline trenches and fauna mortality may result if trapped fauna are not removed in a timely manner or through drowning in flooded trenches. The proponent's proposed management measures include keeping pipeline trench open times as short as possible, installing fauna refuge points, and having qualified persons clearing the trenches of trapped fauna.</p> <p><i>Short-range endemic fauna</i></p> <p>A total of 91 short-range endemic (SRE) taxa were identified from survey sites within the proposed mine site and the pipeline corridor, and consisted of 10 Classes, 27 Orders, and 68 families of terrestrial and aquatic invertebrates. Arachnids were the most diverse group recorded with 4 Orders and up to 25 Families present. Mygalomorph spiders, pseudoscorpions, and Theridiidae spiders were found in 10%, 14.4%, and 18.9% of the survey sites, respectively. The Dipteran subfamily Chironominae were found at 13.3% of sites. Other groups that were recorded were mainly aquatic organisms such as mites (Acarina), diving beetles (Dytiscidae), and two families of 'true bugs' (Corixidae and Notonectidae).</p> <p><i>Stygofauna</i></p> | <ol style="list-style-type: none"> <li>DEC supports the recommendation for additional surveying as soon as possible to ascertain the local distribution of <i>Bothriembryon</i> species (<i>B. sp</i> "Wellstead") and hence to more accurately define the impact of the proposal on this species. Surveying should be undertaken consistent with the recommendations in Technical Appendix 13.10. <p>To fully determine the conservation status of <i>Yilgarnia currycomboides</i>, and therefore the impact the project poses to this species, additional surveying is required as soon as possible as recommended in Technical Appendix 13.10. Surveying should be undertaken consistent with the recommendations in Technical Appendix 13.10.</p> <p>To fully determine the conservation status of <i>Chenistonia palludigena</i> ms and therefore the impact the project poses to this species, additional surveying is required as soon as possible as recommended in Technical Appendix 13.10. Surveying should be undertaken consistent with the recommendations in Technical Appendix 13.10.</p> <p>The recommendations presented in Section 8 of Technical Appendix 13.9, to reduce the impact of the project on fauna, should be included in the detailed Project Construction and Operation Environmental Management Plan.</p> </li> <li>The document should acknowledge that the Western Ringtail Possum (<i>Pseudocheirus occidentalis</i>) occurs in the Albany area in vegetation types not confined to those dominated by Peppermint (<i>Agonis flexuosa</i>) (pg 177). <p>The Forest Red-tailed Black Cockatoo (<i>Calyptorhynchus banksii naso</i>) (pg 179) is known to feed on some proteaceous species, including <i>Hakea oleifolia</i>, which may extend the area of interest for this species.</p> <p><b>Department of Environment and Conservation (Ecological Systems Branch)</b></p> <ol style="list-style-type: none"> <li>Habitats at the proposed mine site have a rich and diverse vertebrate fauna assemblage with 149 species recorded, comprising 15 native mammal species, 97 bird species, 20 reptile species, and 11 amphibian species. Vegetation clearing at the mine site will impact on fauna populations but it is claimed that as these species are all represented in national parks in the region no significant regional impacts are predicted. While this is probably true, little assessment is made on local impacts and no information is presented on the nearest secure populations. A significant question arises, should clearing of native vegetation be endorsed in a subcatchment area where only 24.15% of reserved and un-reserved vegetation remains.</li> </ol> <p><b>Conservation Council of Western Australia Inc</b></p> <ol style="list-style-type: none"> <li>The high diversity of fauna recorded, and the presence of a number of species of conservation significance suggest this site is important to fauna. The potential for any offset sites, should these be required by the proposal going ahead, to house these fauna will also be important to determine.</li> </ol> </li> </ol> | <p>received, the EPA considers that fauna is a relevant environmental factor. Fauna will be considered under the factor of Biodiversity.</p> |

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|   | <p>Two stygofauna species of conservation significance were located within the modelled groundwater drawdown footprint of the mine. Syncarida - <i>Parabathynellidae sp.</i> and <i>Bathynellidae sp. 2</i> were found at a site located approximately 1.4 km north-west of the proposed mine site. Groundwater modelling indicated that drawdown in the aquifer at this site would be approximately 0.5 m which is unlikely to have an impact on the conservation of these taxa given that the aquifer consists of fine grained Pallinup Siltstone that has a saturated thickness of least 8 m.</p>  | <p>2. The significance of pine plantations at the proposed mine site to cockatoos for feeding should also be assessed and offset or managed if necessary.</p> <p>3. Proponents should finish their environmental surveys before coming to the public with a PER document.</p> <p>4. Potential SRE species, in particular the Bothriembryon snails, need to be more fully investigated to ensure that these species will not be unduly impacted. It would seem possible that these species are restricted to small patches of remnant vegetation. This may potentially be a show stopper for the project and it is strange that the proponent hasn't given this more attention in the PER.</p> <p>It is not clear if additional specimens are also required trap-door spider species <i>Yilgarnia Currycomboides</i>.</p> <p><b>Western Australian Museum</b></p> <p>1. The Executive Summary states that there are no stygofauna of conservation significance in the vicinity of the mine site and notes that there are Candonidae and Syncarida. This is a finding of great significance and represents the southernmost known distribution of stygofauna in WA. Both these higher taxa are of considerable conservation significance being Gondwanan, the latter possibly Pangaeon, relicts. Both taxa are of high importance in Australia where basal taxa are present and both are known to occur as short-range endemics.</p> <p>Why do the Parabathynellidae sp. and Bathynellidae sp. 1 have no bore designation in Table 6.22, only a '1 km NW' of deposit which could place them well into the drawdown area. There is an active research programme, including DNA work, being undertaken on Bathynellacea in Western Australia and considerable data are available, specifically in the Yilgarn region to which this project relates. There is no reason why the taxonomic position of these taxa should not have been resolved by this stage.</p> |   |
| <p><b>Mine closure and rehabilitation</b></p> | <p>Open cut mining will be used to mine the Southdown Magnetite Deposit. The proposed mine is anticipated to have a minimum life of 22 years.</p> <p>The proposed mine pit will have a footprint of approximately 400 ha, a strike length of 6 km, and depth of 300 m. A mine pit void will remain after mining operations cease.</p> <p>Tailings from the first six years of production will be stored in an external tailings storage facility. In following years tailings will be directed back to the mine pit as backfill. In its final configuration, the external tailings storage facility will cover an area of approximately 370 ha to a maximum height of about 40 m above the existing natural ground level.</p> <p>Waste rock from the first four years of production will be stored in an external waste rock dump. From the fifth year of production onwards approximately half of the waste rock would be backfilled into the mine pit void with the rest stored in the external waste rock dump. In its final configuration, the external waste rock dump will cover an area of</p> | <p><b>Department of Agriculture and Food</b></p> <p>1. Given the extraction and export of material from the proposed mine site, the surface topography is likely to be affected. On decommissioning of the mine, it might be assumed that surface contours may be altered from the original landscapes and sumps or areas of depression may be created. These sumps may have an impact in the routing of both groundwater and surface water within the landscape, and this may result in areas surrounding the rehabilitated mine site having an altered hydrological system. The predicted enduring effects that the decommissioned and rehabilitated landscape may have on the groundwater, surface water and surrounding landscape were not apparent in this report (to this reviewer) and further information may be required to assess ongoing impacts following mine decommissioning.</p> <p><b>Conservation Council of Western Australia Inc</b></p> <p>1. Closure planning has been done to standards from 2000. Standards have changed significantly in the last 7 years and the proponent should pick some more up-to-date documents. An example may be the Australian Government leading practice booklets.</p>   | <p>In view of the nature of the concerns that were raised in the comments that were received, the EPA considers that rehabilitation and mine closure planning is a relevant environmental factor.</p> |

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|                                   | <p>approximately 620 ha to a height of 45 m above the existing natural ground level.</p> <p>The proponent has prepared a conceptual closure plan for the mine to comply with the AMEC <i>Mine Closure Guidelines 2000</i> and the ANZMEC/MCA <i>Strategic Framework for Mine Closure 2000</i> with the view to returning the mine site to a self sustaining ecosystem that is consistent as far as possible with the natural surrounding environment.</p> <p>Decommissioning will involve the dismantling and removal of infrastructure, the appropriate disposal of waste materials, and the return of impacted areas to a range of vegetation types and fauna habitats that reflect their original condition as closely as possible.</p> <p>Rehabilitation will be undertaken progressively where possible as disturbed areas become available, and for portions of the tailings storage facility, waste rock dump and other impacted areas, will commence as early as possible in the mining phase.</p> <p>Rehabilitation will include ripping of areas that have become compacted, re-establishment of a stable landform with erosion protection, replacement of topsoil, and spreading of vegetation debris to return organic matter and provide an additional seed source.</p> <p>Management measures for rehabilitation will include appropriate closure criteria, procedures for monitoring, the use of appropriate vegetation species to establish feeding habitat for Carnaby's Black Cockatoo, the use of native flora species of local provenance, and efforts to re-establish Priority Flora.</p> |  |   |
| <b>POLLUTION</b>                  |  |  |   |
| <b>Dust</b>                       | <p><i>Mine site</i></p> <p>The following activities at the proposed mine site have the potential to generate dust:</p> <ul style="list-style-type: none"> <li>• construction;</li> <li>• blasting;</li> <li>• excavation and stockpiling of waste rock;</li> <li>• handling of magnetite ore on the run of mine stockpile;</li> <li>• crushing and processing of the magnetite ore at the processing plant; and</li> <li>• vehicle traffic movements on unsealed roads.</li> </ul> <p>Modelled total suspended particulates (TSP) ground level concentrations (GLCs) at all surrounding conservation reserves are predicted to be well</p>   | <p><b>Department of Environment and Conservation (Air Quality Management Branch)</b></p> <ol style="list-style-type: none"> <li>1. There has been no attempt to develop an emissions inventory for the site that explicitly represents activities. Were predicted dust concentrations well below air quality limits, this would not be a major issue (assuming that a general emissions inventory is appropriately conservative). However, there are indications of breaches of NEPM standards for PM<sub>10</sub> concentrations. As noted in the air quality modelling consultant's report (Technical Appendix 13.12, <i>Preliminary Dust Impact Assessment</i>, SKM): "PM<sub>10</sub> concentrations are below the NEPM standard at most nearby residences (Receptors 11 to 25) except at Grasfeld (Receptor 13), Beulah (Receptor 24) and Nymann (Receptor 25). These three receptors are located within 2 kilometres from the project site. Estimated PM<sub>10</sub> concentrations at Grasfeld, Beulah and Nymann are 141, 187 and 117 µg/m<sup>3</sup> respectively, representing 282%, 374% and 234% of the NEPM standard".</li> <li>2. It is stated in the consultant's report that particle emissions are likely to be overestimated. However, even if this is the case it does not render the breaches acceptable. It only indicates that more careful modelling should have been conducted.</li> </ol> | <p>In view of the nature of the concerns that were raised in the comments that were received, the EPA considers that dust is a relevant environmental factor.</p> |

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|                                   | <p>below the criteria applicable to human amenity (i.e. 15 minute limit of 1000 µg/m<sup>3</sup>, 24 hour limit of 150 µg/m<sup>3</sup>, and 24 hour standard of 90 µg/m<sup>3</sup>).</p> <p>There are no regulatory criteria for dust deposition in Western Australia. The PER document indicates that Environmental Protection Authority in Queensland uses a guideline level for dust deposition of 4 g/m<sup>2</sup>/month. The proponent has used this criteria to derive an approximate daily value of 120 mg/m<sup>2</sup>/day. The deposition of TSP from mining activities is predicted to be well below the chosen criteria, and no adverse impacts are expected.</p> <p>PM<sub>10</sub> GLCs in the vicinity of the mine site are predicted to be below the NEPM 24 hour standard of 50 µg/m<sup>3</sup> except at three nearby residential premises (Grasfeld, Beulah, and Nymann), which are located within 2 km of the mine site.</p> <p>Dust suppression and management measures that would be used during mine construction and operation include the use of water tankers, staged vegetation clearing, and monitoring of dust levels.</p> <p><i>Pipelines</i></p> <p>Pipeline construction activities have the potential to generate dust during the relatively short construction period. The majority of dust suppression and management measures that would be used during mine construction and operation would also be used during pipeline construction. In addition, water sprays would also be used to suppress dust in extremely dry conditions.</p> <p><i>Port operations</i></p> <p>The potential for magnetite concentrate storage and ship loading activities at Albany Port to generate dust would be managed by enclosing all stockpile sheds and processing areas and maintaining concentrate moisture content. The ship loading activities would be subject to the Works Approval and Licence requirements of Part V of the <i>Environmental Protection Act 1986</i>, and these regulatory tools could be used to control dust.</p> | <ol style="list-style-type: none"> <li>3. The use of a constant dust emission rate was also stated to be a limitation of the modelling. The possibility that this might have also contributed to an overestimation of dust concentrations was noted. However, because of the strong wind speed dependence of some forms of dust emission, the actual effect of a constant-emissions presumption can not be estimated without an explicit hourly emissions inventory for the site.</li> <li>4. The existence of limits for dust deposition (4g/m<sup>2</sup>/month) has been mentioned, but there is no mention of deposition rates in the main report. Since the most significant impact of open-cut mining operations tends to involve deposited dust, this is a significant oversight. In the consultant's report, an assessment of dust deposition is reported, and this indicates that, at receptors 13, 24 and 25, the dust deposition rates are also well in excess of the deposition standard. The proponent also needs to justify why the deposition limit is relevant for this operation. It is understood that the limit was developed for coal mining areas in NSW.</li> <li>5. The modelling has been performed using the Gaussian plume model "Ausplume", which has some limitations in the modelling of dust deposition. This issue should be discussed in the report.</li> <li>6. Meteorological data were derived using the meteorological modelling component of the dispersion model "TAPM". TAPM has some limitations in the modelling of nocturnal wind speeds. This may not be an issue in this case, because of the common dominance of daytime periods in episodes of high dust concentrations from open cut mining. However, it would have been useful for a comparison to have been made between the TAPM estimates and measurements at either Albany or Mettler, particularly in terms of wind variations through the day.</li> <li>7. The report mentions an intention to implement a dust management plan to minimise impacts. However, it is not clear whether the sites used as bases for the emissions estimates incorporate dust management plans, so the potential for emissions reduction when a dust management plan is in operation is also unclear. The proponent should clarify this point.</li> </ol> <p><b>Department of Health</b></p> <ol style="list-style-type: none"> <li>1. The full nature and application of dust management procedures in Air Quality - Dust, Management (Section 8.13) are not clear and in particular the Dust Management Plan. Most of the issues are covered but there are apparent inconsistencies, uncertainties and gaps in what is being proposed. The main points that need to be better enunciated and implemented are: <ul style="list-style-type: none"> <li>• Development of a dust management plan that will apply throughout the construction and operation phases of the project;</li> <li>• Consultation with the Department of Environment and Conservation and DOH in regard to the plan and other relevant environmental management documents;</li> <li>• Air dust monitoring at receptors where the levels may exceed or approach NEPM levels;</li> </ul> </li> </ol> |   |

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|                                   |  | <ul style="list-style-type: none"> <li>• Proactive management and responses to possibly excessive dust levels, including acute episodes;</li> <li>• Full adherence to the NEPM guidelines; and</li> <li>• Checking and management if necessary of mine dust in regard to any heavy metals it contains.</li> </ul> <p><b>Conservation Council of Western Australia Inc</b></p> <ol style="list-style-type: none"> <li>1. The potential for dust to impact on remnant vegetation needs to be addressed as a risk assessment. The Conservation Council does not believe that no dust will leave the mine site, especially given the strong winds typical of the area.</li> </ol> <p>Any impacts on the Stirling Range national park would be considered unacceptable given the environmental and social importance of this park, and the prevalence of existing threats such as dieback, weeds and fire.</p> <ol style="list-style-type: none"> <li>2. Dust management at the port will be critical to avoid both environmental damage and damage to Albany's other sustainable economic activities.</li> </ol> <p>The Conservation Council encourages strict and enforceable conditions on all port operations to avoid the problems that most other minerals export ports are having across WA (Port Headland, Geraldton, Esperance).</p> <p><b>Public</b></p> <ol style="list-style-type: none"> <li>1. It is stated in the proposal (5.3.2) that the magnetite iron ore slurry is not dangerous or carcinogenic. To my knowledge this statement was correct however after a quick search in the internet I found a review which examined the association between iron and cancer in humans (Huang, 2003). Huang states that "Workers of iron ores and steel foundries have an elevated risk of lung and stomach cancers. Although some investigators have suggested that inhaled iron compounds are merely carriers of other carcinogenic and the proponents need to reconsider their dust control measures in line with the best toxicology information available. In my opinion the magnetic iron ore should be pelletised at the mine site and transported by truck and dust levels monitored at both the mine and port (dust monitoring I believe is proposed to some extent). Other benefits of this approach would be a smaller area required at the port.</li> </ol> |   |
| Noise                             | <p><i>Mine site</i></p> <p>Construction and operation of the proposed mine will increase ambient noise levels in the surrounding areas. Noise will be generated by construction equipment, blasting, mobile plant, and the processing plant, and mine operations will be undertaken 24 hours per day.</p> <p>Modelled noise levels from mining operations in the middle and eastern end of the proposed mine pit are predicted to exceed the <i>Environmental Protection (Noise) Regulations 1997</i> L<sub>A10</sub> assigned level of 35 dB(A) at night at the three nearest residential premises (i.e. Grasfeld, Beulah, and Nymann).</p> | <p><b>Department of Environment and Conservation (Environmental Noise Section)</b></p> <ol style="list-style-type: none"> <li>1. Lack of information: Useful information for a proper technical assessment is missing due to the short report and simplified modelling that has been undertaken. For instance, the sound power of a haul truck was given as 120 dB(A) in the Noise Assessment of the Proposed Operations at the Southdown Magnetite Project (Ref. 60W-05-1649-TRP-185082-1-Wrd) [Report 1], and was estimated to be 110 dB(A) in the Noise Assessment of the Proposed Albany Port Development (Ref. 60W-05-1649-TRP-185124-0-draft) [Report 2]. While it can be accepted that the above reports referred to two different models of haul truck, because the make, model and power of the equipment was not listed in the reports, it is not possible to assess whether the noise information provided is reasonable, or whether the equipment selected is the quietest that is available.</li> </ol>   | In view of the nature of the concerns that were raised in the comments that were received, the EPA considers that noise is a relevant environmental factor. |



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|                                   | <p><i>Pipelines</i></p> <p>Potential pipeline construction noise impacts in farmland areas will be managed via communication with the owners of the properties traversed by the pipeline corridor. Construction of the pipelines and associated land reclamation work along the northern shore of Princess Royal Harbour is predicted to increase noise levels in nearby residential and commercial premises above the assigned levels. As such, construction activities would need to be undertaken in accordance with Regulation 13 of the <i>Environmental Protection (Noise) Regulations 1997</i>.</p> <p><i>Port facility</i></p> <p>Construction of the port facility, which will include a concentrate thickener tank, filter plant, storage shed and ship loader, is predicted to result in noise impacts on nearby residential and commercial premises. The modelled noise level at the nearest residential premises is predicted to comply with the assigned level. However, the modelled noise level at the nearest commercial premises is predicted to exceed the assigned level, and as such, construction activities would need to be undertaken in accordance with Regulation 13 of the <i>Environmental Protection (Noise) Regulations 1997</i>.</p> <p>Operation of the port facility will generate noise from motors, pumps, conveyors, and the ship loader. Noise levels generated by existing operations at the port exceed the assigned levels under the <i>Environmental Protection (Noise) Regulations 1997</i> at the nearest neighbouring premises. At the nearest residential premises the noise level is predicted to be 47.2 dB(A) which exceeds the applicable <math>L_{A10}</math> level of 45 dB(A). At the nearest industrial premises the noise level is predicted to be 60.7 dB(A) which is below the applicable <math>L_{A10}</math> level of 65 dB(A).</p> | <p>The lack of information is also seen in the noise modelling. It is difficult to understand how the predicted noise levels were obtained and how the noise contours were plotted.</p> <ol style="list-style-type: none"> <li>2. Predicted noise contours (Report 1): The predicted 35 dB noise contours - with and without the noise barrier were portrayed as round circles, which appears to oversimplify the model. No topography information is included in the calculation (unless it is uniform in all directions). Neither is there any information on barrier location, structure, and dimensions.</li> </ol> <p>A 20 m noise barrier that is accommodated by the noise bund in the western end was proposed and discussed. However, more information of this barrier is required, such as where it is to be located, how it will be built, and its structure and dimensions etc. The noise insertion loss of the proposed barrier is about 11 dB, which seems high. More information is required on how this performance was estimated.</p> <ol style="list-style-type: none"> <li>3. Fixed plant noise concentrated at one location (Report 1): All fixed plant noise is assumed to be centralised at the location of the Secondary Crusher. While it is generally acceptable to treat fixed noise sources as centralised point sources when predicting noise at far field, the conveyor is better treated as a line source, due to its length (3000 m) that is comparable to the modelling distance.</li> <li>4. Tonality problem: Tonality of the noise emission was not mentioned in Report 1, but was briefly discussed in the Noise Assessment of the Grange Resource Operations at Albany Port (Ref. 60W-05-1649-trp-185163-0-) [Report 3] which indicated that “<i>Purchasing specifications will need to exclude equipment that may have impulsive, tonal or modulation characteristics</i>”, and hence the assumption of broad-band noise with no tonality was made. However, it is generally recognised that most mining equipment has tonal or even impulsive characteristics and it may not be practicable to purchase items to the above-mentioned specification. For instance, both conveyor and conveyor drive noise are tonal. Most motors, pumps, and mobile equipment also have tonal characteristics. Crushers may have impulsive characteristics. The inclusion of these noise characteristics will increase the non-compliance of the noise emission. The proponent needs to provide more information to demonstrate how the tonality and impulsiveness of their noise emissions at mining site and in the Albany Port operations will be addressed.</li> <li>5. Proposed noise management at mine site: Non-compliance with <i>Environmental Protection (Noise) Regulations 1997</i> would occur at the mine site, especially when the mining operations approach the eastern end. As such, Commitment 32 in the PER document which states that “The management plan will ensure the Project complies with <i>Environmental Protection (Noise) Regulations 1997</i>”, cannot stand. Instead of making every effort to minimise the noise level at NSPs and achieve full compliance, the proponent proposes to offer noise reduction treatments for residential houses within 4.5 km of the mine site, such as double glazing the windows, installing air-conditioner units, or implementing other appropriate noise control strategies. While this proposal is sufficient to cover all possibly affected areas around the mine site, non-compliance will still occur outdoors. Also, the acceptability of this proposal by the potentially affected residents is unknown. The proponent needs to look at what is needed to achieve full compliance. For instance,</li> </ol> |   |

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|                                   |   | <p>the proponent should assess the effect of limitation on hours of operation, depth of pit and weather conditions as a means of minimising noise emission and achieving compliance.</p> <p>6. Predicted noise levels at noise sensitive premises: Though predicted noise level at the nearest noise sensitive premises (NSPs) around the Port operations was given, it is not clear how this result was obtained. A significant amount of required information is missing in Report 3, such as what modelling was used, how noise sources were distributed and modelled, and what other parameters were selected. A noise contour diagram for the areas around the Grange operations would also be helpful.</p> <p>Background noise level at NSPs: No background noise or existing noise levels at the nearest NSPs were measured or mentioned. The existing noise levels may play an important role in determining the acceptable noise levels for the Grange operation at these sites. The Grange operation may 'significantly contribute' to any existing noise exceedances, in which case the noise emissions would need to meet criteria 5dB below the Assigned Level. This is more important for the NSPs around the Port operations. Due to the proximity of the residences to the industrial-classified land, the existing noise level could already be too high to be ignored. Information of the current existing noise level and the predicted cumulative noise level at these NSPs is required.</p> <p>7. Proposed noise management for Port operation: The estimated noise level at the nearest NSP is about 2 dB over the Assigned Level. To achieve compliance with the <i>Environmental Protection (Noise) Regulations 1997</i>, noise reduction was proposed by enclosing all drives on the shiploader. It was estimated that this treatment would enable the operation to just meet the Regulations. Using the information in Table B2 in Report 3 it has been calculated that this treatment will at its maximum reduce the total noise from the Grange operation to about 45.3 dB(A) at the nearest NSP which is marginally above the Assigned Level of 45 dB(A). As indicated previously, Grange may need to reduce its operational noise to 5 dB below the Assigned Level. Grange should look at reducing noise as far as practicable. Analysis of Table B2 demonstrates that the treatment of the agitator's motor and pump may be at least as effective as treating the shiploader. Further treatment of the agitator noise will reduce the noise at the nearest NSP to below 42 dB(A). This option needs to be considered. Enclosing other motors or pumps for further noise reduction should also be considered where necessary. Grange Resources should make a firm commitment to achieve full compliance for Port operations.</p> <p><b>Public</b></p> <p>1. Overall the proposal appears adequate in terms of noise at both the mine site and port. However in my experience living closer to the port is that at times operations continue between the hours of 11pm and 7am which are unacceptable loud and keep residents awake irrespective of the noise limits. In my opinion residents should be able to have activities stopped between 11pm and 7am that inhibits sleep by ringing the EPA and complaining. This in my opinion needs to be a condition of any license given to Grange Resources.</p> |   |
| Surface water and groundwater     | The project requires approximately 2.7 gegalitres (GL) of water per year for construction activities, dust suppression, process plant operations, and | Department of Environment and Conservation (Land and Water Quality Branch)   | In view of the nature of the concerns that were raised in |

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|                                   | <p>slurry production. The proponent intends to obtain water from groundwater and rainfall surface run-off harvesting from the mine site. This alone would not provide sufficient water for the proposal and the proponent is evaluating other options such as groundwater and rainfall surface run-off harvesting from adjacent catchments and wastewater from the Albany wastewater treatment facility.</p> <p>Surface water catchments within the mine site are localised due to the undulating topography and do not significantly extend beyond the mine site boundary.</p> <p>Groundwater beneath the proposed mine site currently flows in a south-easterly direction at a depth ranging from approximately 17 m to 27 m below the ground surface. Modelling indicates that the extent of groundwater drawdown at 22 years of mine life would be largely contained within the mining leases. Water within the drawdown cone would flow towards the mine pit. Although dewatering is expected to lower groundwater levels, they are expected to recover after mine closure. The section of the mine pit that is not backfilled is expected to form a pit lake.</p> <p>Surface water and groundwater at the mine site may be impacted by the discharge of contaminated water into the surrounding environment, acid mine drainage and leachate from the waste rock dumps and the tailings storage facilities, and the disturbance to natural surface water and groundwater flow patterns from the mine pit. The proponent proposes to manage these potential impacts by:</p> <ul style="list-style-type: none"> <li>• directing excess contaminated water resulting from significant rainfall events into the mine pit void for on-site management;</li> <li>• pumping potentially contaminated groundwater obtained from within the drawdown cone on the mine site to a contaminated water storage facility to enable it to be used as process water;</li> <li>• minimising the oxidation of potentially acid forming waste rock and tailings via encapsulation; and</li> <li>• managing acid rock drainage by reducing the ingress of oxygen or the infiltration of water into, or through the waste rock storage facilities.</li> </ul> <p>Surface water run-off from the port facility may be impacted by slurry and magnetite concentrate spillages and hydrocarbon and chemical spills. Process water from the port facility will not be released into the environment during operation. Surface water run-off overflow from the port facility drainage systems will be discharged into the marine environment. Gross pollutant traps or silt traps would be used in the port facility drainage systems to reduce the potential for impacts on the marine environment.</p> | <ol style="list-style-type: none"> <li>1. Although the overall hydraulic conductivity of host rock for the mineral deposit is low, the area is structurally complex with extensive shearing and there are likely to be preferred flow paths for groundwater flow which have a much higher permeability than the bulk rock. Groundwater flow modelling of fractured rock environments such as this is much less reliable than modelling uniform porous medium aquifers, and the higher level of uncertainty should be reflected in contingency measures to cover the possibility that the groundwater flow system does not behave as predicted. That is, although it is likely that any contaminants generated by dewatering will eventually flow back to the pit void, how will this be assessed and what will be done if this is found not to be the case?</li> </ol> <p><b>Department of Environment and Conservation (Environmental Management Branch)</b></p> <ol style="list-style-type: none"> <li>1. Section 5.4.2 Water Supply (pg 90) states “<i>non-impacted water that meets environmental criteria may be discharged off-site</i>”. There is no information on what these criteria are or descriptions of the receiving environment. The environmental impact of this action requires assessment.</li> <li>2. In areas where the water table is above the base of the pipeline trench excavation, and where conventional trenching techniques would be inappropriate, horizontal directional drilling may be used for pipeline installation (Technical Appendix 13.18 pg 21). DEC supports this approach and recommends that these areas be identified in the Pipeline Construction and Operation Environmental Management Plan.</li> </ol> <p><b>Department of Agriculture and Food</b></p> <ol style="list-style-type: none"> <li>1. Monitoring and evaluation of the impact on groundwater levels and quality have not been considered. Monitoring and evaluation needs to become an integral part of the process. This raises questions such as; what would be the impact of the process on small but important water resources in Wellstead?</li> <li>2. It has been assumed that the Pallinup siltstone has low hydraulic conductivity. This is not the case around the mine site. Spongolite and coarse material are likely to overlay the ore body. These materials have high hydraulic conductivities. Storage of water over these areas may cause high recharge rates.</li> <li>3. Groundwater salinity increases with depth, and salinity of the deep groundwater aquifer is higher than the shallow aquifer. The report needs to describe the preventative methods to avoid contaminating the shallow aquifer with saltier water from depth.</li> <li>4. Figure 8.2 shows that dewatering may reduce groundwater levels in an area up to 1000 m away from the mine site. This figure may be underestimated. Werillup Formation to the south and to the north of the ore have high hydraulic conductivity. Dewatering will increase hydraulic gradient. The present rates of groundwater flow (1 m per day) will increase under high hydraulic gradient and conductivity. The areas impacted by the process will be much more than the proposed area.</li> <li>5. The extraction of almost 3 GL per annum for process water may impact on local groundwater systems. This has been shown in results of studies in a water balance</li> </ol> | <p>the comments that were received, the EPA considers that surface water and groundwater is a relevant environmental factor.</p> |

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|                                   |                          | <p>model, which provides some evidence that it is sustainable. We are not sure of the function of the process water and how much is actually used. Is it a valid assumption that the process water is largely recycled than an actual annual consumption of 3 GL of water?</p> <p><b>Conservation Council of Western Australia Inc</b></p> <ol style="list-style-type: none"> <li>1. The decision to source harvest production water from the pit it supported by the Conservation Council. It is considered that sourcing water from the Werillup Formation has potential to pose significant and difficult to predict risks given the current (preliminary) knowledge of this aquifer. A separate approval process and assessment for this source must be required if insufficient water is able to be sourced at site.</li> <li>2. The detailed water supply has only accounted for 87% - 93% of the required water supply for the mine. Given that rainfall is generally declining in the region it is likely that the use of historical data in the modelling may have led to an overestimate.</li> </ol> <p>The proposal to source a significant amount of additional water, up to 13% of the project requirement, from adjacent catchments or groundwater with no assessment of the impact on these areas is not acceptable. Water is an increasingly important issue both for environmental flows and human use. It is of great interest to the community and the company should be required to address its entire water consumption prior in the PER.</p> <ol style="list-style-type: none"> <li>3. The King and Kalgan River's are important environmentally and also to the local community. The river crossing method and its impact must be included in the public environmental review.</li> <li>4. The Conservation Council has been advised (from an informal source) that there are serious implications for a magnetite slurry pipeline if it is shut down, such as potential for the slurry to dry like concrete in the pipeline. If this is true it would have implications for the commitment that the pipeline would be shutdown immediately in the case of a leak.</li> </ol> <p>The commitment to put a containment line around the pipeline immediately following a leak is also questioned without further information. The pipeline is over 100 km long and it would take some time to mobilize a bulldozer. Does the company have agreements with farmers along the pipeline who have the appropriate machinery to rapidly respond to a breach? How much material would be lost from the pipeline in the expected response time?</p> <p>It is accepted that a breach is unlikely; however, the implications should be understood, especially for potential breaches in sensitive areas, such as at river crossings.</p> <p><b>Department of Health</b></p> <ol style="list-style-type: none"> <li>1. Mosquito management strategies have been identified; however, DOH would like to reinforce the need to ensure these are developed for application during initial</li> </ol> |   |

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| <p><b>Acid rock drainage</b></p>  | <p>A sulphidic shear zone is known to exist within parts of the Southdown Magnetite Deposit. The disturbance of sulphidic material and its subsequent exposure to air enables the sulphides within the soil/rock to be oxidised by a group of bacteria known as chemolithoautotrophes that use sulphur as an energy source. This results in sulphuric acid being generated as a by-product. Leachate from acid forming waste rock either drains into waterways or reacts with carbonates and clay minerals in soils and sediments, liberating dissolved aluminium, iron, manganese, and heavy metals such as copper and arsenic (CSIRO 2004). The acid leachate and liberated metals have the potential to contaminate surface water and groundwater, and cause vegetation dieback.</p> <p>Dewatering activities at the mine site may result in lowering of the water table thereby enabling oxidation of acid generating materials to occur. Figure 8.2 in the PER document indicates that the modelled extent of groundwater drawdown at 22 years of mine life is largely contained within the mining leases. The PER document indicated that water potentially impacted by acid mobilised within the drawdown cone will flow towards the open pit where it would be pumped to the impacted water storage facility and be used as process water.</p> <p>A geochemical assessment of major rock types and process residue for the Southdown Magnetite Deposit determined that of the estimated 1,050 million tonnes of waste rock that would be generated by the proposed mine, 93% would be non acid forming, 4% would be acid forming, and 3% would be potentially acid forming. The assessment indicated that there is a low potential for leachate to contain environmentally toxic elements. However, the leachate from waste rock, if poorly managed, could possibly contain elevated concentrations of aluminium and iron. The assessment also indicated that there is little potential for long term acid neutralisation in the waste rock.</p> <p>Tailings material produced at the mine site has been classified as potentially acid forming due to the presence of trace sulphides (pyrite and pyrrhotite) and the lack of carbonate materials.</p> <p>Potentially acid forming waste rock and tailings will be conveyed to the storage facilities where they will be compacted and encapsulated with inert waste rock or covered with a store and release cover system to prevent oxidation of the potentially acid forming material.</p> | <p>construction stages, as well as during ongoing operations.</p> <p><b>Department of Environment and Conservation (Land and Water Quality Branch)</b></p> <ol style="list-style-type: none"> <li>One issue that still needs to be addressed is developing a management strategy for the most sulphidic component of the waste stream. As this material contains in the order of 12% sulphur mostly in potentially very highly reactive pyrrhotite, the kinetic behaviour of this material on exposure to oxygen needs to be assessed to ensure it is managed sufficiently quickly to prevent oxidation, and to enable the long-term leachate quality from this material to be predicted with a higher level of confidence.</li> </ol> <p>To date, potential leachate quality from waste rock and tailings has only been assessed for a limited a limited range of metals that are mobilised in acidic drainage. However, there are a number of other metals and metalloids of environmental concern often associated with iron-skarn type mineral deposits which have not been currently been tested. Many of these including vanadium, molybdenum, selenium and uranium (from a chemical toxicity, not a radiological point of view) are mobile under neutral or alkaline conditions and have the potential to adversely affect the health of wildlife that may access the final pit void water body. It is recommended that existing geochemical data for the mineral deposit are assessed and additional leaching trials are carried out if necessary to ensure that the full range of toxicants that could be leached from waste rock at the site is addressed and managed.</p> <p><b>Department of Environment and Conservation (Environmental Management Branch)</b></p> <ol style="list-style-type: none"> <li>There is no information on management strategies to deter fauna from accessing acid tailings storage areas (pg. 59). Information addressing this issue is required.</li> </ol> <p><b>Department of Agriculture and Food</b></p> <ol style="list-style-type: none"> <li>The proposal talks about restricting movement of groundwater within the tailings material, both during operation and post closure. Backfill should not become a barrier to groundwater movement. Provisions are required to allow groundwater flow from north of the mine to the south. They may install PVC pipes at different depths so that deep and shallow aquifers continue to flow.</li> </ol> <p><b>Conservation Council of Western Australia Inc</b></p> <ol style="list-style-type: none"> <li>It is not clear if the PAF materials in the ore body have been mapped during drilling of the ore body. This should have occurred, or else the proponent should re-drill the site to ensure that the distribution and volumes of PAF are known prior to any mining occurring.</li> <li>The tailings storage plans seem to be preliminary. Whilst the use of pit backfill in this case appears to be a sensible option in terms of post mining visual amenity and rehabilitation, the implications for potential acid and metalliferous drainage into groundwater needs to be fully understood by appropriate modelling such that a full assessment of potential impacts can be made.</li> </ol> <p>The issue is complicated by the lack of any acid reducing neutralising material</p> | <p>In view of the nature of the concerns that were raised in the comments that were received, the EPA considers that acid rock drainage is a relevant environmental factor. Acid rock drainage will be considered under the factor of surface water and groundwater.</p> |

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|                                   |                          | <p>available in the waste with which to line the waste dump or tailings facility.</p> <p>As the proposal currently stands there is no way the EPA or the community can assess the risk to the environment from the PAF tailings.</p> <p>Deferring this issue to a management plan is not an acceptable solution. Recent events at Esperance Port should be enough of a warning about the danger of deferring key unaddressed project issues to future management plans.</p> <p>History has shown that some mines, had they adequately considered AMD issues, would never have been opened from both an environmental and an economic perspective. Deferring critical issues to a management plan removes the option of avoiding unacceptable impacts altogether by rejecting the project.</p> <p>3. The nature of the magnetite production process appears to produce very concentrated acid forming tailings yet there is no defined management procedure for these tailings. A range of options is presented but the implications of each of these are not explored and a preferred option is not offered. No management commitments are made around this issue.</p> <p>Options using a supposedly impermeable liner are not supported as these are not long term solutions and present a risk of a “time bomb” scenario where a plume of built up pollution may be released.</p> <p>Deferring this issue to a management plan is not an acceptable solution. Recent events at Esperance Port should be enough of a warning about the danger of deferring key unaddressed project issues to future management plans.</p> <p>The Conservation Council recognizes that a higher than normal level of planning has gone into the tailings storage for this project; however, also points out that this project has a higher than usual level of risk associated with it. This is both because of the nature of the materials and the environmentally sensitive location and because of the fact that it is the first magnetite mine that has been assessed by the WA EPA.</p> <p>4. The proponent plans to use lime for the neutralisation of sulphuric acid produced during production, for neutralization of acidic tailings and for neutralisation of slurry before transportation in the pipeline. Increasingly the mining of lime (for agricultural and industrial purposes) is impacting on sensitive coastal environments. The impacts of sourcing this lime should be considered as an important part of this proposal.</p> <p>5. The minerals sands industry has struggled for many years to integrate the fines from minerals sands processing into rehabilitation because the fines tend to dry and crack like clay and creating a hostile environment for plant growth. It appears from the proposal that this problem may also exist for the fines from Magnetite processing and may be complicated further by acid forming chemicals.</p> <p>The Council is concerned that this issue has not been considered and may result either in considerably greater land being required for treatment of the tailings before backfill, or else failure of large trees in the rehabilitation.</p> |   |

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|   |   | <p>6. The potential to have a highly acidic pit lake following closure is of concern and if this is likely to be a reality then the implications of this lake for the terrestrial environment (water and fauna) and groundwater need to be considered.</p>  |   |
| <p><b>Acid sulphate soils</b></p>               | <p>The proposed mine site is located within an area classified as having low to no risk of acid sulphate soils generally to depths greater than 3 m (WAPC Albany- Torbay Acid Sulphate Soils Map, 2004). The PER document indicated that it is not expected that topsoil stockpiles will need to be managed to prevent acid generation.</p> <p>The King River, Kalgan River and their tributaries are classified as having moderate to low risk of actual acid sulphate soils and potential acid sulphate soils occurring at depths greater than 3 m. Construction of the pipelines will involve trenching of river beds. The exposure of potential acid sulphate soils may lead to localised oxidation of the soils, and acid created from oxidised soil could potentially be flushed downstream.</p> <p>The pipeline corridor traverses areas of high risk for acid sulphate soils where it runs adjacent to the rail corridor and Lower Denmark Road in the City of Albany. The reclaimed land along the Albany foreshore and within the Albany Port is also categorised as high risk of actual acid sulphate soil and potential acid sulphate soil less than 3 m below the surface.</p> <p>The excavation of high risk sites could result in the spread of existing acidic material and the creation of acid sulphate soil through the exposure of sulphidic material to oxidation. The potential exists for these areas to have perched water tables. Any acid that is generated through inappropriate management of soils in high risk areas could lead to the contamination of surrounding surface water, groundwater, and ecosystems. The inappropriate disposal of potentially acidic water could result in the degradation of surrounding vegetation, impacts to surrounding land use, and contamination of surface waters.</p> | <p><b>Department of Environment and Conservation (Land and Water Quality Branch)</b></p> <p>1. The proponents should seek to minimise soil disturbance and dewatering at all sites where the proposed pipeline crosses rivers and wetlands, not just those mapped as being of "high risk" on the acid sulphate soil risk maps. The preferred method of laying the pipeline in these areas is via one of the trenchless technologies rather than by trenching and dewatering.</p> <p><b>Conservation Council of Western Australia Inc</b></p> <p>1. The important issue of acid sulphate soils should not be relegated to a management plan. This issue could have unacceptable impacts on the King River, Kalgan River and the marine environment. At the very least drilling around these key areas should have been carried out. Options for river crossings that minimize the potential for acid sulphate soils should have been examined to reduce the impact on the river.</p> <p>Deference to an acid sulphate soils management plan is not an acceptable response from the proponent for a potentially critical issue. The community and the EPA need to have an opportunity to assess and comment on these issues. This cannot happen when the issue is deferred to a management plan. Such deference should only be allowed for very minor and routine issues with low potential impacts.</p> <p><b>Wildflower Society of Western Australia (Inc)</b></p> <p>1. We note the pipeline passes through area of high risk of acid sulphate soils. Should the project proceed the EPA should see that an environmental bond of sufficient magnitude is imposed. This should be done under the Environmental Protection Act as the Department of Industry and Resources has a history of imposing bonds which are likely to be less than 25% of the estimated remediation cost. This is clearly unacceptable in a high risk area. In any case the remediation should also be the subject of a legally enforceable ministerial condition.</p> | <p>The EPA considers that the proponent's proposed management measures that would be employed during pipeline construction to minimise potential impacts in areas known to contain acid sulphate soils are adequate. The EPA considers that this environmental factor does not require further evaluation.</p>  |
| <p><b>Disturbance of contaminated sites</b></p> | <p>Contaminated site investigations undertaken by the proponent identified two contaminated sites in the Albany area that would be traversed by the pipeline corridor. These are the existing train refuelling facility and former rail depot, and the former City of Albany landfill and associated maintenance shed.</p>  | <p><b>Department of Environment and Conservation (Land and Water Quality Branch)</b></p> <p>1. Based on the information provided in the Public Environmental Review (PER), it is understood that there will be disturbance of an existing contaminated site during installation of the pipeline corridor for the project. The nature of the disturbance is described as the excavation of a trench 1 m to 2 m wide and 1.5 m to 2 m deep. The PER identifies this site as "Location 9 Rail Depot" and proposes that a "Phase 2A Intrusive Investigation" is conducted in this area. From the figure provided (Figure 6.7 of the PER), it appears that this site may be within the "Albany Waterfront Development" project. The Albany Waterfront Development project has been assessed by the EPA (EPA Bulletin 1241). Detailed contamination investigations and management plans have already been developed for the Albany Waterfront Development project. It is recommended that the proponents for the Albany Iron Ore Project liaise with the proponents for the Albany Waterfront Development project in relation to contamination issues at the site.</p> <p>It is recommended that site investigations are carried out in this area according to the</p>  | <p>The EPA considers that the disturbance of contaminates sites arising from pipeline construction activities can be adequately managed by the proponent via consultation with the Department of Environment and Conservation's Contaminated Sites Branch in order to ensure compliance with the <i>Contaminated Sites Act 2003</i> and the <i>Contaminated Sites Regulations 2006</i> which are administered by the Department of Environment and Conservation. In view of</p> |

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|                                   |   | <p>DEC Contaminated Site guidelines, and any contaminated soil is managed appropriately.</p> <p>The DEC has not yet been provided with a copy of the Phase 2A Intrusive Investigation or the Phase 2B Intrusive Investigation so cannot yet comment on these reports.</p> <p>It should be noted that, in accordance with Regulation 31(1)(c) of the <i>Contaminated Sites Regulations 2006</i>, any future reports regarding contamination investigations prepared as part of the PER process or to comply with any future Ministerial Conditions for this project will need to be accompanied by a contaminated sites auditor's report.</p> <p><b>Department of Health</b></p> <ol style="list-style-type: none"> <li>1. The second objective in the Contaminated Sites, Management Objectives (Section 8.4) should also include protection of the public. There may also need to be flow-on changes to other parts of the PER where this issue objective is listed.</li> <li>2. The first reference in the Applicable Standards and Guidelines (Section 8.4.2) to contaminated sites should refer to the <i>Contaminated Sites Regulation 2006</i>. This correction and associated guidance should also be appropriately designated elsewhere in the PER.</li> </ol> | <p>the above, the EPA considers that this environmental factor does not require further evaluation.</p>   |
| <p><b>Greenhouse gases</b></p>    | <p>The Southdown Magnetite Proposal is expected to produce the following estimated quantities of greenhouse gas emissions from the direct and indirect sources listed below:</p> <ul style="list-style-type: none"> <li>• 139,740 tonnes of CO<sub>2,e</sub> per year from the annual consumption of approximately 51,760 kL of diesel fuel;</li> <li>• 2,790 tonnes of CO<sub>2,e</sub> per year from the use of 16,670 tonnes of ANFO (ammonium nitrate and diesel fuel) for blasting activities;</li> <li>• 598,000 tonnes of CO<sub>2,e</sub> per year from the annual consumption of approximately 624,150 MWh of electricity from the South West Interconnected System (SWIS); and</li> <li>• a peak of 14,200 tonnes of CO<sub>2,e</sub> per year in 2009 from biomass decomposition associated with land clearing which will gradually reduce to about 4,700 tonnes of CO<sub>2,e</sub> per year in 2015;</li> </ul> <p>Total greenhouse gas emissions under full production are predicted to be approximately 750,000 tonnes of CO<sub>2,e</sub> per year.</p> | <p><b>Conservation Council of Western Australia Inc</b></p> <ol style="list-style-type: none"> <li>1. Magnetite mining and processing is a more greenhouse intensive way to source iron ore than traditional mining methods. As such, this difference must be made up for in some way if the project is to be approved, i.e. by appropriate offsets. These would best be incorporated into biodiversity offsets projects. The overall emissions profile of the project should also be reduced by funding the addition of additional renewable energy capacity into the SWIS, such as a new wind farm, given that the majority of emissions come from direct energy use from the SWIS.</li> </ol> <p>If this makes the project uneconomical then clearly magnetite mining is an unacceptable way to produce iron ore due to its excessive greenhouse gas emissions.</p> <p>The purchase of existing remnant vegetation as suggested in the PER is not a greenhouse gas offset.</p> <p>Reporting greenhouse gas emissions and increasing efficiency (often marginally) is not an acceptable response in this era where the overwhelming scientific consensus is that we need to immediately begin reducing greenhouse emissions to avoid dangerous climate change.</p>   | <p>The proponent should manage greenhouse gas emissions from the proposal in a manner that is consistent with the relevant policies and initiatives outlined in the Premier's Climate Change Action Statement (May 2007). In view of the above, the EPA considers that this environmental factor does not require further evaluation.</p> |
| <p><b>Marine environment</b></p>  | <p>Land reclamation activities associated with slurry and return water pipeline construction together with spillages of magnetite during operation of the ship loader at the new port facility have the potential to impact on the nearshore marine environment.</p>  | <p><b>Department of Environment and Conservation</b></p> <ol style="list-style-type: none"> <li>1. What are the potential environmental impacts of the spillage of magnetite into the marine environment in terms of sediment and water quality and effects on marine fauna? Are there likely to be any other additives in the final processed magnetite product that require discussion in this section of the PER in terms of impacts on the marine environment?</li> </ol>  | <p>The EPA considers that the concerns that were raised have been adequately addressed by the responses provided by the proponent and the management measures that will be used by the proponent in relation to</p>   |



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|                                   |                          | <p>2. The proponent should provide confirmation as to whether the loading/unloading operations will be regulated under Part V of the <i>Environmental Protection Act 1986</i>. Has Grange received advice from the DEC confirming that a Works Approval and Licence will be required for the port component of the proposal?</p> <p>3. There is still no information on contingency measures for the spillage of product and material from loading operations. The mention of the Albany Port Authority's (APA's) Oil Spill Contingency Plan is unlikely to be applicable to the issue of magnetite product spillage.</p> <p>4. The statement that "The loading process will be monitored to ensure no significant spillages of magnetite occur" requires further discussion. How will this occur? What performance targets will be employed?</p> <p>5. It is unclear how the marine impacts from loading and unloading will be monitored by the proponent. For example, will the proponent commit to undertake regular sediment/water quality monitoring and analysis to confirm the effectiveness of loading management measures? How will marine monitoring/management relate/interact with the APA's monitoring of marine environmental quality?</p> <p>6. What type of environmental requirements/conditions will be imposed on the proponent by the Albany Port Authority?</p> <p>7. It is recommended that the proposal to use dredge spoil as construction material should be done only after extensive testing as similar spoil from the Peel Estuary has found to contain substantial amounts of pyrite and stored actual acidity in the form of soluble secondary iron sulphate minerals such as jarosite.</p> <p><b>Department of Water</b></p> <p>1. The reclamation is unlikely to have direct impacts on seagrass, but the refraction of wave action may lead to loss of seagrass in the nearshore area. Any such loss would need to be addressed in the environmental offset policy. This can be applied through implementation of the Waterways Conservation Act's licensing powers (a no net loss of seagrass is used by the DoW in its application of the Act in the Albany harbours).</p> <p><b>Conservation Council of Western Australia Inc</b></p> <p>1. Losses of seagrass, turbidity, dumping of spoils and other marine impacts have not been considered in this document. These are all potentially significant impacts.</p> <p>Impacts include potential to impact on marine animals of conservation significance that utilize the King George Sound, including cetaceans, seals and sea lions. It is likely that a number of other marine fauna of significance could be impacted by lost sea grass beds, increased shipping and turbidity.</p> <p>The use of a deep water spoil location does not imply a lack of environmental values; in fact the deepwater sponge diversity off WA's south coast is impressive.</p> <p><b>Western Australian Museum</b></p> | <p>ship loading. Construction and operation of the ship loader will be covered by Works Approval and Licence conditions under Part V of the <i>Environmental Protection Act 1986</i>. In view of the above, the EPA considers that this environmental factor does not require further evaluation.</p> |

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|                                   |  | <p>1. We are concerned with possible impacts on the marine environment of the nine hectares of land to be reclaimed for the project at Albany Port. The seagrass in Princess Royal Harbour and King George's Sound have been affected historically by fertilizer and other nutrient run off. Any plans need to ensure that there are no further impacts on the marine environment.</p>  |  |
| <b>SOCIAL SURROUNDINGS</b>        |  |   |  |
| <p><b>Visual amenity</b></p>      | <p><i>Mine site</i></p> <p>The proposed mine site is located on relatively flat land adjacent to the South Coast Highway in a rural area about 10 km from the small community of Wellstead. Construction of the mine and associated infrastructure will produce highly visible changes to the landscape. While existing roadside vegetation would visually screen ground level operations, large infrastructure such as the processing plant and waste rock dumps may be visible above the vegetation line.</p> <p><i>Port infrastructure</i></p> <p>The proposed port facilities will be highly visible from local recreational areas, important historical and indigenous sites, tourist lookouts, residential areas, and boats in Princess Royal Harbour and King George Sound.</p> | <p><b>Department of Planning and Infrastructure</b></p> <p>1. The visual impacts on the shoreline and landscape of the entrance to the harbour is significant. Impacts stem largely from the berth's location immediately adjacent to the prominent rocky headland that forms the northern side of the natural entrance to the harbour, and its proximity to Possession Point.</p> <p>The PER does not adequately address problems with the design method as noted by John Cleary in Technical Appendix 13.15. Of particular importance is the need to identify potential negative visual impacts, especially on the south side of the entrance, and indicating ways in which these impacts can be addressed.</p> <p>Visual impacts have been reduced by orientating the eastern edge of the reclaimed area back towards the shore at a tight angle, thus protecting a portion of the natural shoreline at the headland on the north side of the harbour's entrance. However, it is recommended that this angle be even tighter.</p> <p>The proposed outer rock layer on the edge of the reclaimed area will comprise local granite. This will assist in integrating the berth into its landscape setting, as the colouring will blend better than other options, such as orange lateritic rock.</p> <p>2. The colour and design of the storage shed are of vital importance in reducing potential visual impacts and as such should receive more attention in the PER. The advice of an architect should be sought in finalising the shed's colour and design.</p> <p>The shed as depicted in simulations is a simple, single structure that stands out due more to its bulk and length rather than its height or width. Accordingly, simulations should be produced to show several design options for the height, bulk and scale of the proposed shed in a visually prominent and unique site context.</p> <p>The simulations should also outline alternative site plan layouts that demonstrate surface and sub-surface disturbance has been minimised and the visual and ecological values are maximised.</p> <p>The appearance of the shed's large bulk and scale could be reduced by utilising architectural features and/or modulations such as ridges, ribs or just flat roof sections of a different colour (e.g. white) at even intervals along the shed's length. The use of natural landscape elements could also be used to soften the hard structural elements of the shed.</p> <p>For example, if the shed were divided into the appearance of having four segments, each individual segment would be more comparable in scale to nearby existing infrastructure.</p> | <p>The electricity transmission line referred to in the submission from the Conservation Council of WA Inc does not form part of the proposal.</p> <p>The proposed management measures to minimise the impact on visual amenity from the mine site and the port facility are considered to be adequate. The visual impact of the port facility will not be inconsistent with the existing industrial infrastructure in terms of scale and structure. In view of the above, the EPA considers that this environmental factor does not require further evaluation.</p> |

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|                                   |                          | <p>The smaller shed located to the north-east of the storage shed should be of similar design and the same colour as the larger shed.</p> <p>3. Simulations should be produced which show several colour options. The current simulations use a dull, dark grey-green colour for the shed. However, greens tend to fade to a yellow tone over time, and it is rare that the green chosen actually blends with the particular green of the surrounding vegetation.</p> <p>It is therefore suggested that the alternative of a dark grey be considered. The grey could be chosen to blend with surrounding rock outcrops, specifically those areas that are stained darker by algae, wave action etc. The grey would blend with both nearby rock outcrops and the water.</p> <p>The surface of the reclaimed area would look less intrusive where visible (eg from elevated positions above the site) if material of a dark or earthy colour is used, eg black asphalt, as opposed to a light, reflective colour such as concrete.</p> <p>4. Simulations of post development land form, land values, land use and land tenure options should be further explored.</p> <p><b>Conservation Council of Western Australia Inc</b></p> <p>1. The rural and natural character of Albany that supports tourism in Albany and the surrounding regions may also be threatened by the mine itself. During operation and potentially after closure the mine will be visible from important tourism destinations such as the Stirling Ranges.</p> <p>These social and economic impacts should be considered more seriously by the proponent.</p> <p>The infrastructure in the town and the mine site itself both have potential to seriously impact the visual amenity of these important tourism areas. It is highly unlikely that a visual impact management plan will make any difference whatsoever to this critical issue.</p> <p>2. The environmental implications of the connection to the SWIS are not discussed. These may be significant for:</p> <ul style="list-style-type: none"> <li>• Remnant vegetation; and</li> <li>• Visual amenity in the important tourism area around the Stirling Ranges.</li> </ul> <p>Given that this issue has already caused some controversy it is a significant oversight and the Council questions how this EIA process can be further advanced without addressing this issue as part of the PER process.</p> <p><b>Public</b></p> <p>1. The proposed reclamation, processing and storage facility is extremely poor</p> |   |

| Preliminary Environmental Factors | Proposal Characteristics   | Government Agency and Public Comments Received During the Public Review Period   | Identification of Key Environmental Factors  |
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|                                   |  | <p>aesthetically compared to the current coastline this must have an impact on tourism and recreational users on the waterway. The proponents appear to put little value on this and once the development goes ahead we will have lost a beautiful part of Albany. To me this is unacceptable.</p>   |  |
| <p><b>Heritage</b></p>            | <p>A desktop survey indicated that the proposed development would potentially impact an ethnographic Aboriginal heritage site (Site ID 21837, Creek 3) listed on the Department of Indigenous Affairs - Aboriginal Site Register.</p> <p>The pipeline corridor will also intersect a site called Kinjarling, which is currently not registered on the Department of Indigenous Affairs - Aboriginal Site Register. Archaeological and ethnographic surveys of the mine site and pipeline corridor located and recorded seven archaeological sites at the mine site and one new ethnographic site was recorded within Albany. This site was a historical campsite and water source located within urban Albany at Point Melville.</p> | <p><b>Department of Indigenous Affairs</b></p> <ol style="list-style-type: none"> <li>Grange Resources, and their heritage consultants have been in discussion with the DIA for some time regarding their obligations under the <i>Aboriginal Heritage Act 1972</i>. The Public Environmental Review report clearly details Grange's understanding of their obligations under the <i>Aboriginal Heritage Act 1972</i>, and a commitment that appropriate permissions will be sought prior to any Aboriginal heritage sites being impacted.</li> </ol> <p><b>Heritage Council of Western Australia</b></p> <ol style="list-style-type: none"> <li>Two properties, which are located close to the proposed pipeline, are listed on the City of Albany's Municipal Inventory: <ul style="list-style-type: none"> <li>Albany Airfield and 'Sigint' Radar System, located at Albany Airport, Albany highway, Willyung; and</li> <li>Napier Hall, located on Chester Pass Road, Napier.</li> </ul> </li> </ol> <p>I suggest you also contact the City of Albany for any recent additions to their municipal Inventory.</p> <p><b>Western Australian Museum</b></p> <ol style="list-style-type: none"> <li>The document states that the objectives for the management of the social and cultural environment are to avoid disturbance to maritime, cultural and heritage sites. It states that no registered heritage sites will be removed, damaged or altered. However, the impacts are as yet unknown as heritage, both indigenous and European is more than a matter of 'sites'. The 100 km pipeline trench from the mine to the port for the transport of magnetite concentrate might be a low impact solution, but it could well be costly in terms of heritage. We are concerned that the excavations required will possibly expose sites and artefacts of significance, particularly as the pipeline reaches the town. A more detailed historic and archaeological survey is required. Heritage, it must be remembered, is more than individual sites - it also includes the landscape.</li> </ol> <p>The City of Albany is the site of Western Australia's first European settlement. The possibility that items of historic significance will be found is real, particularly in the area around the Western Australian Museum. We consider that there could be an opportunity to build on that Albany history already known with an historical archaeology project, with educational outcomes.</p> <p>The WA Museum Albany is situated within Heritage Site 9312, one of the most historic locations in Western Australia. The residency was built in 1856 as a depot for hiring convicts and converted into a house for the government residents in 1873. It became a branch of the Western Australian Museum in 1975 - the first outside Perth. The Museum is located within 100 metres of the proposed pipeline corridor</p> | <p>The EPA considers that the concerns that were raised have been adequately addressed by the responses provided by the proponent and the proposed management measures that will be used by the proponent in relation to heritage. In view of the above, the EPA considers that this environmental factor does not require further evaluation.</p> |

| <b>Preliminary Environmental Factors</b> | <b>Proposal Characteristics</b>                    | <b>Government Agency and Public Comments Received During the Public Review Period</b>  | <b>Identification of Key Environmental Factors</b>  |
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|  |  | <p>and it is to be hoped that consultation on the nature and impacts of the work will be ongoing.</p> <p><b>Department of Planning and Infrastructure</b></p> <ol style="list-style-type: none"> <li>1. Suggest 8.20 be revised to include the environmental impact and management of physical and human infrastructure needed to service the life of the project. This requires identification of infrastructure types, capacity and phasing up front rather than later.</li> </ol> |   |
| <b>Recreation and tourism</b>            | The proposal may impact on recreation and tourism. | <p><b>Department of Planning and Infrastructure</b></p> <ol style="list-style-type: none"> <li>1. Section 8.20 should also outline the economic flow-on effects and impacts on local marine based and recreational / tourism industries.</li> </ol>  | The EPA considers that the concern that was raised has been adequately addressed by the response provided by the proponent. In view of the above, the EPA considers that this environmental factor does not require further evaluation. |

| <b>PRINCIPLES</b>   |                        |  |
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| <b>Principle</b>  | <b>Relevant Yes/No</b> | <b>If yes, Consideration</b>   |
| <p><b>1. The precautionary principle</b><br/> <i>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 application of this precautionary principle, decisions should be guided by -</i></p> <p>a) <i>careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i></p> <p>b) <i>an assessment of the risk-weighted consequences of various options.</i></p>   | Yes                    | The proposal has the potential to impact flora, vegetation, fauna, surface water and groundwater. Therefore, monitoring and management measures should be implemented to detect changes and avoid significant impact.              |
| <p><b>2. The principle of intergenerational equity</b><br/> <i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>  | Yes                    | Resource would be permanently reduced in this area. Resource can be used for infrastructure which could benefit future generations and may be recycled in the future.  |
| <p><b>3. The principle of the conservation of biological diversity and ecological integrity</b><br/> <i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>  | Yes                    | The proposal would result in the loss of approximately 257.6 ha of remnant/native vegetation and has the potential to affect diversity integrity. Biodiversity is a relevant environmental factor addressed in this report.        |
| <p><b>4. Principles relating to improved valuation, pricing and incentive mechanisms</b></p> <p>(1) <i>Environmental factors should be included in the valuation of assets and services.</i></p> <p>(2) <i>The polluter pays principles - those who generate pollution and waste should bear the cost of containment, avoidance and abatement.</i></p> <p>(3) <i>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 waste.</i></p> <p>(4) <i>Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, 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.</i></p> | Yes                    | The proposal would require waste storage (waste rock and tailings), environmental monitoring, rehabilitation and ongoing management until a stable self sustaining landform is established. The proponent should bear these costs. |
| <p><b>5. The principle of waste minimisation</b><br/> <i>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</i></p>  | Yes                    | The proposal would generate waste (waste rock, tailings, and domestic and construction wastes), hence the proponent should address the waste hierarchy and minimise the generation of unavoidable wastes.                          |

# **Appendix 4**

## **Recommended environmental conditions**

## RECOMMENDED ENVIRONMENTAL CONDITIONS

Statement No.

### **STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE *ENVIRONMENTAL PROTECTION ACT 1986*)**

#### **ALBANY IRON ORE PROJECT - SOUTHDOWN MAGNETITE PROPOSAL MINE, ORE SLURRY AND WATER PIPELINES, AND PORT LOADING FACILITIES 90 KILOMETRES EAST-NORTH-EAST OF ALBANY**

**Proposal:** The proposal involves the construction and operation of an open pit magnetite mine located approximately 90 kilometres east-north-east of Albany, and pipelines for ore slurry transport and return water, connecting the mine site and new port loading facilities in the Port of Albany.

**Proponent:** Grange Resources Limited

**Proponent Address:** Level 11, 200 St George's Terrace, PERTH WA 6000

**Assessment Number:** 1596

**Report of the Environmental Protection Authority:** Bulletin 1291

The proposal referred to in the above report of the Environmental Protection Authority may be implemented. The implementation of that proposal is subject to the following conditions and procedures:

#### **1 Proposal Implementation**

1-1 The proponent shall implement the proposal as assessed by the Environmental Protection Authority and described in schedule 1 of this statement subject to the conditions and procedures of this statement.

#### **2 Proponent Nomination and Contact Details**

2-1 The proponent for the time being nominated by the Minister for the Environment under sections 38(6) or 38(7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal.

Published on



2-2 The proponent shall notify the Chief Executive Officer (CEO) of the Department of Environment and Conservation of any change of the name and address of the proponent for the serving of notices or other correspondence within 30 days of such change.

### **3 Time Limit of Authorisation**

3-1 The authorisation to implement the proposal provided for in this statement shall lapse and be void within five years after the date of this statement if the proposal to which this statement relates is not substantially commenced.

3-2 The proponent shall provide the CEO of the Department of Environment and Conservation with written evidence which demonstrates that the proposal has substantially commenced on or before the expiration of five years from the date of this statement.

### **4 Compliance Reporting**

4-1 The proponent shall submit to the CEO of the Department of Environment and Conservation environmental compliance reports annually reporting on the previous twelve-month period, unless required by the CEO of the Department of Environment and Conservation to report more frequently.

4-2 The environmental compliance reports shall address each element of an audit program approved by the CEO of the Department of Environment and Conservation and shall be prepared and submitted in a format acceptable to the CEO of the Department of Environment and Conservation.

4-3 The environmental compliance reports shall:

1 be endorsed by signature of the proponent's chief executive officer or a person, approved in writing by the CEO of the Department of Environment and Conservation, delegated to sign on behalf of the proponent's chief executive officer;

2 state whether the proponent has complied with each condition and procedure contained in this statement;

3 provide verifiable evidence of compliance with each condition and procedure contained in this statement;

4 state whether the proponent has complied with each key action contained in any environmental management plan or program required by this statement;

5 provide verifiable evidence of conformance with each key action contained in any environmental management plan or program required by this statement;

- 6 identify all non-compliances and non-conformances and describe the corrective and preventative actions taken in relation to each non-compliance or non-conformance;
  - 7 review the effectiveness of all corrective and preventative actions taken; and
  - 8 describe the state of implementation of the proposal.
- 4-4 The proponent shall make the environmental compliance reports required by condition 4-1 publicly available in a manner approved by the CEO of the Department of Environment and Conservation.

## **5 Performance Review and Reporting**

- 5-1 The proponent shall submit to the CEO of the Department of Environment and Conservation Performance Review Reports at the conclusion of the first, third, fifth, seventh and ninth years after the start of implementation of the proposal and then, at such intervals as the CEO of the Department of Environment and Conservation may regard as reasonable, which address:
- 1 the major environmental risks and impacts; the performance objectives, standards and criteria related to these; the success of risk reduction/impact mitigation measures and results of monitoring related to the management of the major risks and impacts;
  - 2 the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable; and
  - 3 significant improvements gained in environmental management which could be applied to this and other similar projects.

## **6 Declared Rare Flora**

- 6-1 The proponent shall implement the proposal such that the areas where the gazetted Declared Rare Flora species *Commersonia* sp. Mt Groper has been recorded or is likely to occur as shown in Figure 4 (attached) and delineated by AMG coordinates listed in schedule 2, will not be disturbed by mining or impacted by dewatering until such time as a viable off-site population is established or located in secured reserve or a protected area such that the threat status of the species would not change from “Endangered” to “Critically Endangered”.
- 6-2 The proponent shall establish and maintain a monitoring regime to demonstrate that the areas referred to in condition 6-1 have not been disturbed by mining or impacted by dewatering, until such time as a viable

off-site population is established or located in secured reserve or a protected area such that the threat status of the species would not change from “Endangered” to “Critically Endangered”. This monitoring is to be carried out to the satisfaction of the CEO of the Department of Environment and Conservation.

- 6-3 The proponent shall submit the results of monitoring referred to in condition 6-2 to the CEO of the Department of Environment and Conservation at times determined by the CEO of the Department of Environment and Conservation.

## **7 Fauna**

- 7-1 Trapped fauna within open trenches shall be cleared and recorded by a suitably trained fauna-clearing person no later than three hours after sunrise each day, and the clearing and recording shall be repeated before sunset each day.
- 7-2 Trapped fauna within open trenches shall be cleared and recorded by a suitably trained fauna-clearing person within one hour prior to backfilling of trenches.

Note: “fauna-clearing person” means an employee of the proponent whose responsibility it is to walk the open trench to recover and record fauna found within the trench. The fauna-clearing person shall have fauna handling experience which meets the requirements of the CEO of the Department of Environment and Conservation.

- 7-3 Open trench lengths shall not exceed a length capable of being inspected and cleared by the fauna-clearing person within the required times set out in conditions 7-1 and 7-2.
- 7-4 The proponent shall monitor weather forecasts through the Bureau of Meteorology and in the event of a weather forecast indicating rainfall sufficient to cause flooding of trenches or drowning of fauna trapped in trenches, the proponent shall, in consultation with the Department of Environment and Conservation, backfill all lengths of open trench with the potential to be flooded or cause drowning of fauna.
- 7-5 Within 14 days following the completion of the ore transport and return water pipeline construction, the proponent shall provide a report on fauna management within the pipeline corridor to the CEO of the Department of Environment and Conservation.

## **8 Surface Water and Groundwater**

- 8-1 The proponent shall ensure that run-off and/or seepage from the waste rock and tailings storage facilities do not cause the quality of surface water or groundwater within or leaving the proposal area to exceed ANZECC\* requirements, taking into consideration natural background water quality, so

that existing and potential uses, including ecosystem maintenance, are protected.

\*- *Australian Water Quality Guidelines for Fresh and Marine Waters*, ANZECC (November 1992, and its updates).

8-2 The proponent shall monitor the quality of any run-off and/or seepage from the waste rock and tailings storage facilities entering surface water and groundwater on or in proximity to the proposal area. This monitoring is to be carried out to the satisfaction of the CEO of the Department of Environment and Conservation.

8-3 The proponent shall submit the results of the monitoring required by condition 8-2 to the CEO of the Department of Environment and Conservation.

8-4 The proponent shall provide proposed management measures to the CEO of the Department of Environment and Conservation in the event that the requirements of condition 8-1 are not met or are not likely to be met.

## **9 Dust Management (Mine Site)**

9-1 During construction and operation, the proponent shall manage mine site operations and facilities to maintain PM<sub>10</sub> ground level concentrations at all occupied residences in areas surrounding the mine site below the National Environment Protection Measure 24-hour standard of 50 micrograms per cubic metre. The proponent shall monitor PM<sub>10</sub> ground level concentrations to the satisfaction of the CEO of the Department of Environment and Conservation.

9-2 The proponent shall submit the results of PM<sub>10</sub> monitoring required by condition 9-1 to the CEO of the Department of Environment and Conservation.

9-3 The proponent shall provide proposed management measures to the CEO of the Department of Environment and Conservation in the event that the requirements of condition 9-1 are not met or are not likely to be met.

## **10 Mine Closure and Rehabilitation**

10-1 Prior to the commencement of productive mining, the proponent shall conduct surveys of the proposal area to collect baseline information on the following:

1. pre-mining soil profiles;
2. groundwater levels;
3. surface water flows;
4. vegetation complexes; and
5. landscape and landforms.

- 10-2 As mining progresses, the proponent shall commence rehabilitation of the mine site area in accordance with the following:
1. Re-establishment of vegetation in the rehabilitation area to be comparable with that of the pre-mining vegetation such that the following criteria are met within four years following the cessation of productive mining:
    - (1) flora and vegetation are re-established with not less than 70 percent coverage (not including weed species); and
    - (2) weed coverage less than 10 percent.
  2. A schedule of rate of rehabilitation acceptable to the CEO of the Department of Environment and Conservation.
- 10-3 The proponent shall ensure that the final pit lake does not cause significant environmental impacts arising from groundwater pollution or through attracting native fauna which may subsequently be harmed or fauna which may harm surrounding native vegetation.
- 10-4 In liaison with the Department of Environment and Conservation, the proponent shall monitor progressively the performance of rehabilitation against the criteria in condition 10-2 based on annual reporting.
- 10-5 The proponent shall submit annually a report of the rehabilitation performance monitoring required by condition 10-4 to the CEO of the Department of Environment and Conservation.

**11 Decommissioning (Infrastructure, including Pipelines, Buildings and Roads)**

11-1 Within 12 months following the cessation of productive mining, the proponent shall complete the following procedures and measures:

- 1 Ensure that the site is suitable for future land uses;
- 2 Remove or, if appropriate, retain plant and infrastructure agreed in consultation with relevant stakeholders;
- 3 Rehabilitate all disturbed areas to a standard suitable for the agreed new land use(s); and
- 4 Identify contaminated areas, and provide evidence of notification and proposed management measures to relevant statutory authorities.

**Procedures**

1. Where a condition states “on advice of the Environmental Protection Authority”, the Environmental Protection Authority will provide that advice to the Department of Environment and Conservation for the preparation of written notice to the proponent.
2. The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the Department of Environment and Conservation.
3. The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environment and Conservation over the fulfilment of the requirements of the conditions.
4. Where a condition lists advisory bodies, it is expected that the proponent will obtain the advice of those listed as part of its compliance reporting to the Department of Environment and Conservation.
5. The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

## Schedule 1

### The Proposal (Assessment No. 1596)

#### General Description

The proposal involves the construction and operation of an open pit magnetite mine located approximately 90 kilometres east north-east of Albany, and 10 kilometres south-west of Wellstead, and pipelines for ore slurry transport and return water, connecting the mine site and new port loading facilities in the Port of Albany.

The new port loading facilities will include a concentrate thickener tank, filter plant, storage shed and ship loader.

The disturbance footprint of mining plus the pipeline corridor connecting the mine site and the Port of Albany will not exceed 1810 hectares.

The proposal is described in the following document – *Albany Iron Ore Project - Public Environmental Review, Southdown Magnetite Proposal, EPA Assessment No. 1596*, Ecologia Environment (1 February 2007).

#### Summary Description

A summary of the key proposal characteristics is presented in Table 1.

**Table 1 – Summary of Key Proposal Characteristics**

| Element  | Description  |
|--|--|
| <b>Mining operations</b>   |  |
| Life of mine   | More than 22 years   |
| Ore mining rate  | Up to 20 Million tonnes per annum  |
| Waste rock mining rate   | Up to 55 Million tonnes per annum  |
| Total concentrate production   | Approximately 145 Million tonnes   |
| Mine pit <ul style="list-style-type: none"> <li>• Depth</li> <li>• Area</li> </ul>   | <ul style="list-style-type: none"> <li>• Not more than 300 metres below ground surface</li> <li>• Not more than 400 hectares</li> </ul>  |
| Remnant vegetation clearing at the mine site   | Not more than 253 hectares   |
| Footprints <ul style="list-style-type: none"> <li>• Topsoil stockpiles</li> <li>• Tailings storage facility</li> <li>• Waste rock stockpiles (external dump area)</li> <li>• Water storage facilities</li> <li>• Mine plant &amp; administration area</li> </ul> | <ul style="list-style-type: none"> <li>• Not more than 100 hectares</li> <li>• Not more than 250 hectares (Maximum height 40 metres)</li> <li>• Not more than 620 hectares</li> <li>• Not more than 33 hectares</li> <li>• Not more than 100 hectares</li> </ul> |

| <b>Element</b>                                    | <b>Description</b>                           |
|---|--|
| Water requirement                                 | Not more than 2.7 gigalitres per annum       |
| Total mining footprint                            | Not more than 1590 hectares                  |
|   |  |
| <b>Pipeline</b>                                   |  |
| Pipeline length                                   | Not more than 104 kilometres                 |
| Pipeline footprint                                | Not more than 220 hectares                   |
|   |  |
| <b>Port infrastructure</b>                        |  |
| Port infrastructure footprint                     | Not more than 9 hectares (on reclaimed land) |
|   |  |
| <b>Disturbance footprint summary</b>              |  |
| Footprint of mining <i>plus</i> pipeline corridor | Not more than 1810 hectares                  |

**Figures (attached)**

- Figure 1: Regional location (Source: Figure 2.1 from *ecologia* Environment, 2007)  
Figure 2: General location (Source: Figure 2.3 from *ecologia* Environment, 2007)  
Figure 3: Albany Port general arrangement plan (Source: Figure 5.13 from *ecologia* Environment, 2007)  
Figure 4: *Commersonia* sp. Mt Groper avoidance areas (Source: Letter from Grange Resources Limited, 2008)

\*\*\* *The abovementioned figures 1 to 3 are as included in the main body of this report.* \*\*\*





## Schedule 2

### Southdown Magnetite Project (Assessment No. 1596)

AMG coordinates for *Commersonia* sp. Mt Groper avoidance areas delineated in Figure 4 below.

| <b>AVOIDANCE AREA 1 - 8.5<br/>HECTARES</b> |                 | <b>AVOIDANCE AREA 2 - 4.9<br/>HECTARES</b> |                 |
|--|-----------------|--|-----------------|
| <b>EASTING</b>                             | <b>NORTHING</b> | <b>EASTING</b>                             | <b>NORTHING</b> |
| 641861.46                                  | 6177044.85      | 639692.69                                  | 6175777.40      |
| 641858.36                                  | 6177065.68      | 639722.32                                  | 6175789.01      |
| 641867.23                                  | 6177077.64      | 639753.45                                  | 6175786.73      |
| 641895.04                                  | 6177084.08      | 639799.48                                  | 6175746.11      |
| 641920.91                                  | 6177078.43      | 639833.88                                  | 6175733.39      |
| 641946.75                                  | 6177071.06      | 639889.38                                  | 6175739.35      |
| 641972.55                                  | 6177061.95      | 639927.94                                  | 6175766.37      |
| 641998.39                                  | 6177054.58      | 640008.79                                  | 6175835.94      |
| 642034.31                                  | 6177029.71      | 640057.21                                  | 6175932.04      |
| 642072.30                                  | 6177023.86      | 640075.30                                  | 6175976.73      |
| 642120.36                                  | 6177000.51      | 640097.83                                  | 6175978.07      |
| 642152.70                                  | 6176968.79      | 640100.23                                  | 6175917.44      |
| 642198.94                                  | 6176940.28      | 640053.42                                  | 6175814.39      |
| 642232.80                                  | 6176896.41      | 640016.78                                  | 6175699.04      |
| 642270.03                                  | 6176847.29      | 639963.84                                  | 6175641.10      |
| 642225.83                                  | 6176794.39      | 639882.01                                  | 6175614.83      |
| 642187.72                                  | 6176793.33      | 639809.36                                  | 6175617.83      |
| 642161.55                                  | 6176781.67      | 639742.89                                  | 6175677.85      |
| 642137.08                                  | 6176768.24      | 639714.10                                  | 6175714.71      |
| 642122.72                                  | 6176739.06      |  |                 |
| 642096.67                                  | 6176734.33      |  |                 |
| 642071.57                                  | 6176684.56      |  |                 |
| 642026.21                                  | 6176664.58      |  |                 |
| 641977.93                                  | 6176675.81      |  |                 |
| 641923.25                                  | 6176716.58      |  |                 |
| 641892.64                                  | 6176748.27      |  |                 |
| 641917.44                                  | 6176780.73      |  |                 |
| 641921.36                                  | 6176806.63      |  |                 |
| 641945.98                                  | 6176828.71      |  |                 |
| 641974.27                                  | 6176862.84      |  |                 |
| 641992.18                                  | 6176897.15      |  |                 |
| 642008.48                                  | 6176938.41      |  |                 |
| 641981.19                                  | 6176961.39      |  |                 |
| 641957.32                                  | 6176982.58      |  |                 |
| 641918.00                                  | 6177010.97      |  |                 |
| 641883.72                                  | 6177030.61      |  |                 |



|   |   |  |  |
|---|---|--|--|
|  |  | <p>Location of<br/><i>Commersonia</i> sp. Mt Groper<br/>on Southdown mine site</p> | <p>Drawn by: SG <span style="float: right;">28/05/08</span><br/>         Coordinate System<br/>         Name: GDA 1994 MGA Zone 50<br/>         Projection: Transverse Mercator<br/>         Datum: GDA 94</p> |
|---|---|--|--|

**Figure 4:** *Commersonia* sp. Mt Groper avoidance areas (Source: Grange Resources Limited, 2008)

# **Appendix 5**

**Summary of submissions and  
proponent's response to submissions**