This Environmental Scoping Document (ESD) is provided to define the requirements of the Public Environmental Review (PER) document to be prepared in accordance with the Western Australian Environmental Protection Act 1986 (EP Act) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The preliminary key environmental factors, Environmental Protection Authority (EPA) objectives and work required are identified in Section 2. The generic guidelines for the format of an environmental review document are available at the EPA’s website www.epa.wa.gov.au.

The Public Environmental Review document must adequately address all elements of this scoping document prior to approval being given to commence the public review.

1. Introduction

The EP Act sets out that where a proposal is considered to have a significant environmental impact it will be subject to an assessment by the EPA under section 38 of the EP Act. This proposal is being assessed by way of a PER because it raises significant environmental factors. The EPA will, at the conclusion of its assessment, prepare a report on the outcome of its assessment of the proposal and give the assessment report to the Minister for Environment. In accordance with the requirements of the EP Act, the Minister for Environment will then decide whether or not the proposal may be implemented, and, if the proposal may be implemented, the conditions that implementation of the proposal should be subject.
The procedure for a PER is described in the Western Australian EP Act Environmental Impact Assessment - Administrative Procedures 2012. The proponent should have regard to the Administrative Procedures when preparing the PER. The EPA's assessment also has regard to the EPA's Significance Framework described in Environmental Assessment Guideline for Application of a significance framework in the environmental impact assessment process – Focussing on key environmental factors (EAG 9).

Under the EPBC Act, a proposed action that has been determined to have a significant impact on one or more Matters of National Environmental Significance (MNES) protected under the EPBC Act will need to be assessed and approved before it can proceed. This proposal was determined as likely to have a significant impact on EPBC Act listed threatened species and ecological communities (EPBC2013/6895). In particular, the native vegetation proposed to be cleared provides for habitat for EPBC listed endangered Carnaby's Black Cockatoo (Calyptorhynchus latirostris) as well as habitat for flora species including Slender Andersonia (Andersonia gracilis) (endangered). Dwarf Green Kangaroo Paw (Anigozanthos viridis subsp. terraspectans) (vulnerable) and Keighery's Macarthuria (Macarthuria keigheri) (endangered). There is also the potential for significant impacts on the critically endangered Western Ground Parrot (Pezoporus flaviventris) and endangered Sandplain Duck Orchid (Paracaleana dixonii) as the proposed action would involve the clearing of potential habitat for these species.

This proposal is being assessed by way of an accredited process with the EPA under the bilateral agreement with the Australian Government made under section 47 of the EPBC Act. The bilateral agreement allows the Australian Government Minister for Sustainability, Environment, Water, Population and Communities to rely on the PER process of the State of Western Australia in assessing the action under the EPBC Act.

The assessment report on the proposed action prepared by the EPA and provided to the Western Australian Minister for Environment is forwarded to the Commonwealth Minister for Environment, Heritage and Water who will then make a decision as to whether or not the proposal should be approved under the EPBC Act. This is separate from any Western Australian approval that may be required.

As this proposal is subject to a PER, the proponent is required to produce a PER document in accordance with an approved ESD. The purpose of the ESD is to:

- develop proposal-specific guidelines to direct the proponent on the preliminary key environmental factors for the proposal that are to be addressed in preparing the PER document; and
- set out the work that is required to identify or predict the direct, indirect and cumulative environmental impacts of the proposal and demonstrate, with reasonable confidence, that the EPA's objectives can be met, including proposed mitigation measures based on best available scientific knowledge and sound judgement.

The EPA has determined that it will prepare and issue the ESD outlining the scope and content of the PER document in relation to this proposal.
The EPA, in its formulation of the ESD, undertakes consultation with the proponent regarding the details of the proposal, its environmental setting and the environmental surveys and investigations required and expected outcomes. In addition the EPA will consult with the relevant government agencies, including Decision Making Authorities (DMAs). The Office of the EPA (OEPA) provides services and facilities for the EPA. In many cases the OEPA will facilitate the assessment on behalf of the EPA.

ESDs prepared by the EPA are not subject to a public review period. The ESD will be available on the EPA website (www.epa.wa.gov.au) upon finalisation and will be included as an appendix in the PER document.

The proponent will then be required to prepare a PER document in accordance with the ESD. When the EPA is satisfied that the PER document has adequately addressed all of the preliminary key environmental factors and studies identified in the ESD, the proponent will be required to release the document for a public review period of 4 weeks.

An important aspect of the environmental impact assessment process is the review by the public. The EPA requires the opportunity for public input into the possible environmental impacts of this proposal and its implementation. The EPA expects the proponent to fully consult with interested members of the public and relevant stakeholders including relevant indigenous groups and the Wildflower Society, and to take due care in ensuring any other relevant environmental factors which may be of interest to the public and stakeholders are succinctly addressed. The PER should document the matters raised in consultation ideally in a table including any changes made to the proposal as a result of consultation and/or the proponent’s response to each matter raised.

The EPA considers that adequate consultation can be demonstrated when stakeholders:

- are included in the consultation process and are able to make their concerns known;
- are kept informed about the potential and actual environmental impacts; and
- receive responses to the concerns raised including identifying how the proposal has been modified and/or identifying management measures that will be implemented to address the concerns raised.

To facilitate adequate public input, the PER should be made available as widely as possible and at a reasonable cost.

2. Specific Guidelines for the preparation of the Public Environmental Review document

2.1 The proposal

The EPA has prepared an Environmental Assessment Guideline for Defining the Key Characteristics of a Proposal (May 2012) (EAG 1). EAG 1 describes how to define
the Key Proposal Characteristics for the purposes of assessing the proposal and subsequent incorporation in the Ministerial Approval Statement. It is expected that the Key Proposal Characteristics will be informed by the outcome of the work required for the environmental factors that are relevant to the proposal specified below (section 2.2).

The proposal that is the subject of this assessment is Tronox Management Pty Ltd proposed Cooljarloo West Titanium Minerals Project. The proposal is for an expansion of current operations at the Cooljarloo mineral sands mine. The EPA reported on the existing operations (EPA Report 330) and the proposal is subject to the requirements of Ministerial Statement 37, 557 and 790.

In view of the above this proposal is a revised proposal which would allow the existing conditions and proponent commitments, (Statement 37, 557 and 790) to be updated into a single Ministerial Statement that is consistent with current practice that would apply across all the mining operations at the Cooljarloo mine.

The proposal area occupies Unallocated Crown Land, lies west of the existing Tiwest operations and east of Nambung National Park. The total area of exploration leases E70/2345 and E70/2346 is approximately 35,000 hectares (ha). The proposal consists of dredge mining operations and infrastructure including roads pipelines and power lines. Temporary topsoil and temporary and permanent overburden stockpiles are proposed. Tailings (sand and clay slimes) will be disposed to mined out pits. The groundwater required for mining operation (16 GL/annum) is proposed to be abstracted from existing bores licensed under the provisions of the Rights in Water and Irrigation Act 1914. In addition to the mining activities, the proposed action will require the movement of the mining dredge and mineral concentrating plant (concentrator) from the existing Cooljarloo Mine to Cooljarloo West and back again via flotation across an open channel (approximately 6 km long, 100 m wide and 6 m deep).

The proposal involves the clearing of 2,250 ha of intact native vegetation. Based on practices at the existing mine, there may be further impacts from groundwater drawdown. The regional location of the proposal is indicated in Figure 1. The proposed development envelope is shown on Figure 2.

The summary of the proposal description and preliminary key proposal characteristics are provided in Table 1.

The proponent should review the existing conditions and commitments contained in Ministerial Statement 37, 557 and 790 and propose within the PER how these conditions could be rationalised and updated within a comprehensive Ministerial Statement.
Figure 1 Regional location of Cooljarloo West

Figure 1 – Regional Location of Cooljarloo West
Figure 2 Proposal development envelope and indicative footprint
**Table 1**

**Summary of the proposal**

<table>
<thead>
<tr>
<th>Proposal Title</th>
<th>Cooljarloo West Titanium Minerals Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proponent Name</td>
<td>Tronox Management Pty Ltd</td>
</tr>
<tr>
<td>Short Description</td>
<td>The proposal is to expand a mineral sands mine located approximately 175 km north of Perth and includes:</td>
</tr>
<tr>
<td></td>
<td>• construction of transportation channel approximately 6 km long and 100 metres (m) wide;</td>
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<tr>
<td></td>
<td>• abstraction of groundwater to enable flotation of dredge and concentrator through channel;</td>
</tr>
<tr>
<td></td>
<td>• topsoil and overburden stockpiles;</td>
</tr>
<tr>
<td></td>
<td>• dredge mining of Kestrel, Harrier and Woolka deposits;</td>
</tr>
<tr>
<td></td>
<td>• tailing storage facility;</td>
</tr>
<tr>
<td></td>
<td>• movement of dredge and concentrator from Cooljarloo West back to Cooljarloo, through the same transportation channel.</td>
</tr>
</tbody>
</table>

The PER should provide a clear project summary which defines the proposed location and extent of the proposal.

**Physical Elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Location</th>
<th>Proposed Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbance and clearing</td>
<td>Figure 2</td>
<td>Clearing not more than 2,250 ha within a development envelope of 4,925 ha.</td>
</tr>
</tbody>
</table>

**Operational Elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Location</th>
<th>Proposed Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawdown</td>
<td></td>
<td>Peak demand (with wet processing) up to 16 Gigalitres per annum (process water allocation existing under current operations)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do we need to remove as has already been assessed?</td>
</tr>
<tr>
<td>Discharge of waste</td>
<td>Figure 2</td>
<td>Overburden in mine voids or ex-pit dumps. Clay-slimes and sand tails into mine voids/tailings storage facility (TSF).</td>
</tr>
<tr>
<td>(waste fines storage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>facility)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation</td>
<td></td>
<td>Progressive throughout life of mine of all disturbed areas including backfilling of mine pits and revegetation with local native flora.</td>
</tr>
</tbody>
</table>

*NB: Table 1 will be informed by the outcomes of the work required for the environmental factors.*
2.2 Preliminary Key Environmental Factors and Objectives, and Policy Documents Relevant to this Proposal

The PER should give a detailed assessment of each of the preliminary key environmental factors identified for this proposal. At this stage, the EPA has identified the preliminary key environmental factors, objectives and work required as detailed below (see Table 2).

The EPA has identified a list of relevant policy documents (see Table 2) which set out how the EPA expects the environmental factors to be considered. The EPA expects that the treatment of environmental factors will be consistent with the approaches set out in these policy documents. The EPA also considers that the proponent should assess the proposal in a local and regional context and ensure that all cumulative impacts are addressed.

The EPA considers that the following are the preliminary key factors relevant to the proposal:

- Flora and vegetation – Clearing of vegetation for mining and infrastructure and the indirect impacts on groundwater dependent ecosystems associated with changes to groundwater and surface water hydrology and water quality;
- Terrestrial vertebrate fauna – Clearing of vegetation and loss of habitat as well as indirect impacts as a result of changes to surface water and groundwater hydrology and water quality;
- Subterranean fauna – the dredge mining process will impact on groundwater levels. It also has potential to affect groundwater quality through exposure of acid sulfate soils.
- Hydrological Processes - the potential changes to surface water and groundwater flows, processes and quality;
- Inland Waters Environmental Quality – potential impacts of acid sulfate soils;
- Rehabilitation and Closure; and
- Offsets.

Table 2: Preliminary key environmental factors

<table>
<thead>
<tr>
<th>EPA objective</th>
<th>Flora and Vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPA objective</strong></td>
<td>To maintain representation, diversity, viability and ecological function at the species, population and community level.</td>
</tr>
<tr>
<td><strong>Potential Impacts</strong></td>
<td>The proposal involves the clearing of not more than 2,250 ha of native vegetation. Clearing has the potential to cause the loss of conservation significant flora species and vegetation. Construction and operation of the proposal may cause indirect impacts on flora and vegetation as a result of dust deposition, spread of weeds, spread of dieback and Changes to groundwater and surface water hydrology and water quality.</td>
</tr>
<tr>
<td>Work required</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td></td>
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</tbody>
</table>
| Description of the impacts associated with the proposal, including direct impacts (i.e. clearing) and the indirect impacts of dust deposition, spread of weeds, spread of dieback and altered surface and groundwater hydrology.  

Flora and vegetation surveys of all areas likely to be directly or indirectly impacted by the proposal undertaken in accordance with EPA (2004) Guidance Statement No. 51 (the decision on the level of survey required should be determined using EPA (2004) Guidance Statement No. 51 - Appendix 2). Include all areas that could be affected by hydrological change, erring towards an overestimate of drawdown area to account for error in preliminary hydrological predictions.  

Level 1 survey conducted in areas that are likely to be directly or indirectly disturbed as a result of the proposal. Where previous survey information is not available, or is not adequate based on the relevant EPA guidance Level 2 surveys are to be undertaken in accordance with Guidance Statement 51.  

If conservation significant flora or vegetation are found or likely to be present within the development envelope, it is essential that a survey targeting suitable habitat for those flora and vegetation is undertaken outside the study area (if existing data is not available) to facilitate the assessment of the potential regional impact of the proposal.  

Figures showing the extent of clearing or loss of vegetation communities and conservation significant flora species from direct and indirect impacts. Maps and electronic spatial data, consistent with finalised hydrogeological reports supporting the PER, showing pre-mining depth to groundwater in relation to flora and vegetation, and groundwater change contours in relation to flora and vegetation.  

Quantitative analysis should include area and percentage of clearing to determine the direct and indirect impacts to flora and vegetation, including the number of conservation significant flora and vegetation and impacts at the local and regional scale.  

Assessment of impacts on conservation significant flora should include the number of plants in the affected populations, the number of plants including cumulative impacts from current operations (directly and indirectly) in a 'worst case scenario' and the number of plants of conservation significant species known to occur outside the disturbance footprint (at both a local and regional scale where possible).  

Discussion of impacts of changes to surface water and groundwater hydrology and water quality on flora and vegetation, considering pre-mining depth to groundwater and surface water availability and predicted changes to these. Use appropriate methods, outlines in the Australian groundwater dependent ecosystem (GDE) toolbox Refer to EPBC Act MNES and provision of quantitative data on impacts of the proposal to species of conservation significance.  

Discussion of potential of indirect impacts to flora and vegetation.  

Baseline mapping of weed and dieback affected areas in any area likely to be directly or indirectly impacted by the proposal.  

Discussion of available baseline and monitoring data in relation to the spread or introduction of weeds and/or dieback related to the existing operations should be applied to the proposed expansion.  

The PER document should contain a separate section identifying MNES that occur or have the potential to occur within the proposal development envelope discussing how any potential direct or indirect impacts on MNES have been avoided and mitigated and discussing any proposed offsets to address any significant residual impacts on MNES. Where required offsets must be developed in accordance with Department of Sustainability Environment Water Population and Communities (DSEWPaC's) EPBC
Targeted surveys of EPBC Act listed flora species and/or habitat that are likely to be impacted by the proposal, including but not limited to the Slender Andersonia (*Andersonia gracillis*) (endangered), Dwarf Green Kangaroo Paw (*Anigozanthos viridis subsp. terraspectans*) (vulnerable) Keithery’s Macarthuria (*Macarthuria keighery*) (endangered) and Sandplain Duck Orchid (*Paracaleana dixonii*) (endangered) in addition to an assessment of habitat quality found onsite for these specific species. Surveys for these species must be conducted in accordance with the survey guidelines detailed in the Department of SEWPaC’s Species Profile and Threats Database (SPRAT).

There is a presumption that there shall be no impact to the Nambung National Park. If necessary, identify where and how the proposal has been modified to demonstrate that there will be no impacts to the Nambung National Park. In addition describe monitoring and mitigation strategies to ensure there will be no significant impact on the adjacent nature reserves. Level 2 flora and vegetation investigations are required in areas where there remains significant risk to land in the conservation estate.

A quantified evaluation of cumulative impacts of clearing on the status of flora and vegetation within the Swan Coastal Plain IBRA sub-region 2 and Geraldton Sandplains IBRA sub-region 2 biogeographic region. Strategies and controls to avoid or minimise these impacts.

Discussion of the progress of existing rehabilitation and mitigation carried out at the existing operations, including any results/learnings that can be applied to rehabilitation works for the proposed expansion. This includes approaches to mitigating impacts of hydrological change on vegetation.

Discussion of proposed management, monitoring and mitigation methods to be implemented.

Provide mapping that shows the extent of the predicted direct and indirect impacts to flora and vegetation for the proposal.

Completion of checklist for documents submitted for EIA on marine and terrestrial biodiversity.

**Definitions**

Conservation significant flora as defined by Guidance Statement 51 includes taxa other than those that are listed at the State or National level as Threatened, Priority and specially protected (e.g. endemic or restricted taxa; new taxa or affinities; taxa at the limits of their range, etc.).

Conservation significant vegetation (defined in Guidance Statement 51) includes vegetation that may be significant for a range of reasons, other than a statutory listing or because the extent is below a threshold level, and may include the vegetation with a restricted distribution, a novel combinations of species, a role as a refuge or role as a key habitat for threatened species.

**Relevant policy/guidance documents**


*Environment Protection and Biodiversity Conservation Act 1999.*
### EPA Checklist for documents submitted for EIA on marine and terrestrial biodiversity.

DSEWPaC (2012) EPBC Act Environmental Offsets Policy.

Environmental Protection and Biodiversity Conservation Regulations 2000, Schedule 4.

Species Profile and Threats Database (http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl)

Western Australian Government, Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012, Perth, Friday 7 December 2012, No. 223


Richardson, S et al. (2011) Australian groundwater-dependent ecosystems toolbox parts 1 and 2. Waterlines reports No 69 and No 70, National Water Commission, Canberra.

### Terrestrial Fauna

#### EPA objective
To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.

#### Potential impacts
The proposal involves the clearing of not more than 2250 ha of native vegetation which provides habitat for fauna. Vegetation clearing would result in loss or fragmentation of fauna habitat and consequential displacement of fauna.

Death or injury of fauna may also occur during clearing and construction and from ongoing operations.

Construction and operation of the proposal has the potential to cause indirect impacts through impacts of weeds, introduction of pathogens affecting fauna and/or vegetation, changes to surface and/or groundwater hydrology, obstruction of fauna movements due to increased presence of human activity.

Impacts from noise and light may occur in the adjacent nature reserve.

#### Work required
Description of the expected direct and indirect impacts to both vertebrate and Short Range Endemic (SRE) invertebrate fauna and habitat from the proposal.

A Desktop study and Level 1 fauna survey should provide a description, maps and electronic spatial data of the habitats present, identifying which ones are groundwater dependent, and which would be affected by changes to surface or groundwater hydrology. This must be consistent with predictions in the finalised hydrogeological reports, and reports assessing impacts on the relevant habitats (e.g. wetlands, vegetation) for the PER. A comprehensive listing of fauna known or likely to occur in the habitats present and identification of conservation significant fauna species likely to occur in the area. Drinking water sources and important, rare or unusual habitat types should be identified.

Where previous surveys are not available, or are not adequate based on the relevant EPA guidance, comprehensive Level 2 surveys are to be conducted in accordance with Guidance Statements 20 and 56.

Where the desktop study and habitat analysis indicates that there is good contextual data available it may be appropriate instead of a comprehensive survey to conduct targeted Level 2 surveys for conservation significant vertebrate species that are known to or likely to occupy habitats in the project area.

Reporting should include a summary, introduction, survey methodology, results, analysis and discussion of findings. A description of habitats sampled should be provided together with maps showing their location indicating areas of habitat outside...
The report will include an evaluation of the regional and local significance of recorded and expected to occur fauna species and habitat types likely to be impacted by the proposal.

The report should contain a discussion of potential impacts to fauna as a result of the proposal, with particular regard to conservation significant fauna and provision of quantitative data on impacts of the proposal to these species.

The PER document should contain a separate section identifying MNES that occur or have the potential to occur within the proposal development envelope discussing how any potential direct and indirect impacts on MNES have been avoided and mitigated and discussing any proposed offsets to address any significant residual impacts on MNES. Where required offsets must be developed in accordance with DSEWPaC EPBC Act Environmental Offsets Policy. More information on the EPBC Act Environmental Offsets Policy is available from:


Targeted surveys of EPBC Act listed flora species and/or habitat that are likely to be impacted by the proposal, in particular the endangered Carnaby’s Black Cockatoo (*Calyptorhynchus latirostris*) and potentially the critically endangered Western Ground Parrot (*Pezoporus flaviventris*) in addition to an assessment of habitat quality found onsite for these specific species. Surveys for these species must be conducted in accordance with the survey guidelines detailed in the Department of SEWPaC’s Species Profile and Threats Database (SPRAT) and the Survey Guidelines for Australia’s Threatened Birds (EPBC ACT Survey guidelines 6.2).

Discussion on measures required to ensure that the adjacent National Park land is not impacted by increased access and/or issues such as light and noise.

Consideration and discussion of cumulative impacts and the development of strategies and controls to minimise these.

Discussion of proposed management, monitoring and mitigation methods to be implemented, including any lessons learned from existing operations.

Completion of checklist for documents submitted for EIA on marine and terrestrial biodiversity.

Vertebrate and SRE invertebrate surveys of all areas likely to be directly or indirectly impacted by the proposal undertaken in accordance with Guidance Statement No. 56 (EPA 2004) and Technical Guide for Terrestrial Fauna Surveys (EPA and DEC 2010) for vertebrate fauna and Guidance Statement No. 20 (EPA 2009) in the case of SRE invertebrate fauna. The decision on the level of survey required should be determined using Table 3, Appendix 2 (EPA 2004) for vertebrate fauna. A decision on the level, intensity, methods and faunal groups sampled for SRE invertebrate fauna shall be based on and consistent with criteria in Guidance Statement No. 20 (EPA 2009).

Discussion of proposed management, monitoring and mitigation methods to be implemented.

Management of impacts (including entrapment and mortality) to terrestrial fauna movement across the landscape due to the proposed construction of the transportation channel should be discussed. Discussions should include addressing the mitigation of the impacts.

The proposal includes the channel being left open during operations, therefore progressive rehabilitation is constrained. Discussions should be included on mitigation impacts on fauna, in particular the Carnaby’s cockatoo.

Discussion of the long-term monitoring of Terrestrial Fauna carried out at the existing operations, including any results/learnings that can be applied to the management and...
monitoring of Terrestrial Fauna for the proposed expansion.
Completion of the terrestrial biodiversity section of the "Checklist for documents submitted for EIA on marine and terrestrial biodiversity".

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<thead>
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<tbody>
<tr>
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<tr>
<td></td>
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<td></td>
<td>Species Profile and Threats Database (<a href="http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl">http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl</a>)</td>
</tr>
<tr>
<td></td>
<td>Survey Guidelines for Australia’s Threatened Birds (EPBC Act Survey guidelines 6.2)</td>
</tr>
</tbody>
</table>

| Subterranean Fauna
---|---|
| **EPA objective** | To maintain representation, diversity, viability and ecological function at the species, population and assemblage level. |
| **Potential impacts** | The proposal involves excavation and removal of potential subterranean fauna habitat and/or dewatering for proposed mining or water drawdown of proposed borefields. Excavation of land and/or dewatering would result in loss of subterranean fauna and their habitat. |
| **Work required** | Description of the expected impacts from the proposal including: direct impacts i.e. excavation and removal of rock or other material likely to contain subterranean fauna habitat, dewatering of an orebody or water extraction from a borefield; and indirect impacts i.e. clearing of native vegetation which overlies likely subterranean fauna habitat. Surveys of all areas likely to be directly or indirectly impacted by the proposal should be undertaken in accordance with Guidance Statement 54 (EPA 2003) and Draft Guidance Statement 54a (EPA 2007). The survey will consist of a desktop study to gather background information on the project area. The desktop study will include a search of regional and project/site specific data including geological and hydrological information, previous studies of the area, and any database records. The desktop study will use all available information to place the project area into a regional context and make predictions about whether the project area is likely to provide habitat for subterranean fauna and consider impacts of... |

the proposal.

The results of the desktop study will be used to determine whether further survey will be undertaken in accordance with EPA (2007).

A description of boreholes sampled will be provided together with maps and electronic spatial data showing their location indicating bores sampled including those where no specimens were recorded. This mapping should show the extent of known or predicted subterranean fauna habitat and the extent of impact area including drawdown/reinjection contours, and must be consistent with finalised hydrogeological reports supporting the PER.

There should be a discussion of potential impacts to subterranean fauna as a result of the proposal.

Discussion of proposed management, monitoring and mitigation methods to be implemented.

Completion of the terrestrial biodiversity section of the “Checklist for documents submitted for EIA on marine and terrestrial biodiversity”.

Relevant policy/guidance documents

- Richardson, S et al. (2011) Australian groundwater-dependent ecosystems toolbox parts 1 and 2. Waterlines reports No 69 and No 70, National Water Commission, Canberra.

Hydrological Processes

EPA objective

To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.

Potential impacts

Changes in groundwater levels and quality from bore abstraction, dewatering, dredging, construction and operation of the channel may result in impacts to flora and vegetation, wetlands, terrestrial fauna habitat and drinking water sources, subterranean fauna, and aquatic ecosystems.

Water sourced for the operation of the channel has potential to contaminate the shallow superficial aquifer and may limit channel design.

It has been reported that there is a “freshwater sapphire” (wetland) at Cooljarloo West which according to existing fauna surveys commissioned by the proponent (Bancroft and Bamford, 2010) is “unique” to the region. There may also be potential for impacts on the Emu Wetland system.

Impacts to surface water flows as a result of proposal implementation, including alterations of existing drainage patterns of Mullering Brook.

Work required

Detailed description of transfer channel design, construction and operation.

Undertake a hydrogeological investigation, to the satisfaction of the Department of Water (DoW), to determine the effect of the proposal on the surface water and groundwater, quantity and quality of the area, including discussions of mounding.
infiltration and evaporation associated with the construction and operation of the channel. The scope of this study must be established in consultation with the DoW, and will require the following at a minimum.

Establish a preliminary estimate defining the expected area effected by drawdown, to be supplied to ecological impact assessors, to allow initiation of their studies. Take into account aquifer connectivity towards an overestimate of drawdown area. Once finalised, provide refined drawdown predictions, approved by DoW, to support these studies.

Wetland mapping and a regional comparison of wetlands (especially the samphire freshwater wetland) to enable the significance of impacts on the affected wetlands to be assessed in the regional context.

Provide maps and electronic spatial data, consistent with finalised hydrogeological reports supporting the PER, showing pre-mining depth to groundwater in relation to wetlands, and groundwater change contours (post-development) in relation to wetlands.

Predict the ecological response to drawdown at wetlands and watercourses, and the significance of these impacts.

Characterise baseline hydrological regimes and water quality in the localised superficial aquifer, wetlands, watercourses, and vegetation over groundwater 0-5m below ground, as required by ecological impact assessors.

Construct a depth to groundwater map of the drawdown area, to be supplied to ecological impact assessors, to support their predictions of ecological response to drawdown.

Develop a conceptual model of the groundwater systems. The conceptual model should incorporate groundwater levels and quality (of both the superficial and Yarragadee aquifer) and estimate the extent of connectivity between these aquifers. Conceptual model must be drafted in consultation with the DoW's Regional Hydrogeologist before incorporated into the groundwater model.

Design a model in accordance with the Australian Groundwater Modelling Guidelines (National Water Commission, 2012), fit for purpose (scale, accuracy, sensitivity) for assessing impacts on ecosystems, other groundwater users and on the water resources (local and regional). In addition, the model should quantify groundwater inflow into the channel, and estimate expected evaporative losses. The parameters and design of this model should be established in consultation with the DoW Regional Hydrogeologist.

Carry out groundwater modelling to predict impacts to hydrological processes and water quality. A sensitivity analysis and external peer review should be carried out by an appropriate hydrogeological consultant. Assess groundwater drawdown including drawdown modelling for contours extending to zero impact, associated with potential operations and potential impacts to wetlands and other groundwater dependent ecosystems, including flora species particularly susceptible to changes in groundwater.

A description of a proposed monitoring network to establish localised water levels should be established, to monitor for post-construction changes in water levels and water quality.

Provide a description of the design and location of surface water diversions, with the potential to impact surface water or groundwater. Define whether the diversions will be permanent or temporary.

Provide a description of the design, location and extent of discharges of the proposed
waste facilities, and any other elements of the proposal with the potential to impact surface water or groundwater.

Discussion of proposed management objectives for environmental assets proposal risks, management actions, monitoring and mitigation methods to be implemented, and contingency actions that could be implemented if monitoring indicates potential for non-compliance pre and post mining activity.

Provide mapping and spatial data that shows and defines the extent of the predicted direct and indirect impacts to flora and vegetation and GDEs including groundwater contours for predicted impacts. Cover the whole mine life.

Describe extent of impacts to surface water flows and groundwater quality from existing operations at the Cooljarloo mine and learnings relevant to the proposed extension.

This should include information regarding the extent of any soil and groundwater contamination (eg from acid sulfate soils or mixing fresh water with lower quality water) associated with the existing operations.

Undertake a hydrological investigation to determine what effect the proposal will have on the surface water and groundwater, quantity and quality of the area.

Characterise baseline hydrological regimes and water quality.

<table>
<thead>
<tr>
<th>Relevant policy/guidance documents</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rights in Water and Irrigation Act (1914)</em></td>
</tr>
<tr>
<td><em>Country Areas Water Supply Act (1947)</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EPA objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>To maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbance of acid sulfate soils resulting in release of acid water and metals and metalloids.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe extent of impacts to surface water flows and groundwater quality from existing operations at the Cooljarloo mine and learnings relevant to the proposed extension.</td>
</tr>
</tbody>
</table>

This should include information regarding the extent of any soil and groundwater contamination (eg from acid sulfate soils) associated with the existing operations.

<table>
<thead>
<tr>
<th>Relevant policy/guidance documents</th>
</tr>
</thead>
</table>
**Rehabilitation and Closure (Integrating Factor)**

**EPA objective**
To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.

**Potential impacts**
- unstable landforms; adverse dust impacts;
- poor return of native vegetation and flora and fauna species;
- vegetation not sustainable because soil profile contains physical or chemical barriers to root growth;
- the introduction of *Phytophthora* Dieback or weeds to rehabilitated areas;
- unsustainable hydrology;
- contamination including increased risk of acid sulfate soil risks; and
- unacceptable State liability.

**Work required**
- Desktop study of successful best practice mine rehabilitation procedures, including a review of learnings from rehabilitation at Cooljarloo to date.
- Provide information outlining baseline data on existing geochemical and geophysical properties of soil (including nutrients, pH, EC, particle size distribution, soil strength and bulk density), landforms and root distribution in soil profiles.
- Identification of completion criteria, including criteria for reconstructed soils and soil profiles (identification and profile reconstruction) and landforms.
- Prepare a Rehabilitation and Mine Closure Plan (RMCP) consistent with the Department of Mines and Petroleum (DMP) and EPA Guidelines for Preparing Mine Closure Plans. Include closure objectives addressing reconstruction of soil profiles able to support the target ecosystem, optimising use of topsoil, and habitat quality for significant flora and fauna. A discussion on backfill options (including ‘worst case scenario’) is also required.

**Relevant policy/guidance documents**

**Offsets (Integrating Factor)**

**EPA objective**
To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.

**Potential impacts**
Potential significant residual impacts on vegetation, flora, fauna habitat and species of State and National significance.
Potential significant residual impacts to Nature Reserve and National Park in proximity of the proposed operations.

Potential significant residual impacts on the Mullering Brook system and significant wetlands resulting from mining activities.

**Work required**

Examination of significant residual impacts and, if required, development of a draft program of environmental offsets.

Identification of residual impacts with regard to MNES and where required offsets must be developed in accordance with Department of SEWPaC’s EPBC Act Environmental Offset policy. More information on the EPBC Act Environmental Offset Policy is available from: http://environment.gov.au/epbc/publications/environmental-offsets-policy.html

Inclusion in the PER of the completed Environmental Offsets Reporting Form and any offsets required and proposed.

**Relevant policy/guidance documents**


Govt of WA (2011) WA Environmental Offsets Policy.

EPA Offsets Reporting Form.

EPA Draft Environmental Assessment Guidelines – Environmental Offsets

DSEWPaC (2012) EPBC Act Environmental Offsets Policy.

These preliminary key factors must be addressed within the environmental review document for the public to consider and make comment to the EPA. The EPA anticipates addressing these factors in its report to the Minister for Environment, which is forwarded to the Commonwealth Minister for Environment, Heritage and Water. All technical reports, modelling and referenced documents (not currently in the public domain) used in the preparation of the PER should be included as appendices to the document and must not contain disclaimers that prevent them being made publicly available. Spatial data should also be provided to the OEPA for validation of predicted impacts.

### 2.3 Factors Not Requiring Further Evaluation in the PER Document

Consistent with the EPA’s Significance Framework (EAG 9), the proponent will only be required to carry out any further necessary studies for the preliminary key environmental factors identified in the ESD.

The following are the environmental factors likely to be affected by the proposal that are not significant or can be regulated and managed by other agencies to meet the EPA's objectives. These environmental factors were identified at the time the EPA made its decision to assess the proposal and/or are based on information provided by decision-making authorities during consultation about the ESD. These environmental factors will not be evaluated in the PER document.

**Table 3: Factors Not Requiring Further Evaluation**
### Factor and EPA objective

<table>
<thead>
<tr>
<th>Factor and EPA objective</th>
<th>Activities and Potential impacts</th>
<th>Relevant legislation and policy</th>
<th>Assessment and, management and mitigation of impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>The proposal will generate dust as a result of land clearing and mining.</td>
<td>Environmental Protection Act 1986</td>
<td>Significant air quality impacts from dust and other emissions are not anticipated to occur due to a lack of sensitive receptors near the project. Air quality impacts from the project can be managed through Works approvals and Licences required under Part V of the EP Act.</td>
</tr>
<tr>
<td>Heritage</td>
<td>Potential impact on Aboriginal cultural materials.</td>
<td>Aboriginal Heritage Act 1972 (AH Act).</td>
<td>The Department of Aboriginal Affairs (DAA) has advised that the proponent has already received consent for the project under section 18 of the AH Act. The potential impacts on Aboriginal heritage are managed and regulated by the DAA.</td>
</tr>
<tr>
<td>Amenities</td>
<td>Potential impact of noise.</td>
<td>Environmental Protection Act 1986 (EP Act)</td>
<td>There are no noise sensitive premises in proximity to the Cooljarloo area that are likely to be significantly impacted by the proposal. Noise impacts that may affect human amenity can be adequately managed under the Environmental Protection (Noise) Regulations 1997. The environmental review document should assess any noise impacts from the proposal on sensitive receptors.</td>
</tr>
</tbody>
</table>

If during the course of the preparation of the PER document, other potential environmental matters or environmental factors are identified, the OEPA should be consulted to determine whether they are to be addressed in the PER document.

### 3. Parallel Processing of Other Approvals

It is the EPA's expectation that other approvals are progressed in parallel with the EPA's assessment noting that the constraint applied by the EP Act to decision making only relates to making the final decision. Proponents are encouraged to pursue other approvals requirements for their projects in parallel with the EPA's assessment. The parallel processing approach will support the capacity of DMAs to
provide input into the other phases of the EIA process and support timely whole of government approvals for projects.

Other approvals required for the proposal include:
- Water Licensing and other approvals required by the DoW; and
- Works Approvals and Licenses required from the Department of Environment Regulation (DER);
- Permit to Take Declared Rare Flora will be required under the Wildlife Conservation Act 1950.

4. Agreed Assessment Milestones

EPA Environmental Assessment Guideline for Timelines for environmental impact assessment of proposals (March 2013) (EAG 6) addresses the responsibilities of proponents and the EPA for achieving timely and effective assessment of proposals.

This timeline (Table 3) is agreed between the EPA and proponent. Proponents are expected to meet the agreed proposal assessment timeline, and in doing so, provide adequate, quality information to inform the assessment. Proponents will need to allocate sufficient time to undertake the necessary studies to the appropriate standard and incorporate the outcomes of the studies into the PER.

Where an agreed timeline is not being met by the proponent, or if adequate information is not submitted by the proponent, the timeline for subsequent steps will be re-established. Where the OEPA is unable to meet a date in the agreed timelines the proponent will be advised as soon as possible.

The EPA will report to the Minister for Environment on whether the agreed proposal assessment timeline has been met. Where the timeline has not been met, the reasons for this will be identified.

Table 4: Agreed Milestones for the proposal

<table>
<thead>
<tr>
<th>Key Stage of Proposal</th>
<th>Agreed Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA approval of ESD Document</td>
<td>31 August 2013</td>
</tr>
<tr>
<td>Proponent submits first adequate draft of PER Document</td>
<td>11 December 2013</td>
</tr>
<tr>
<td>OEPA provides comment on first draft PER Document</td>
<td>22 January 2014 (6 weeks + 2 weeks - Xmas)</td>
</tr>
<tr>
<td>Proponent submits adequate revised draft PER Document</td>
<td>19 February 2014 (4 weeks)</td>
</tr>
<tr>
<td>EPA authorises release of PER Document</td>
<td>5 March 2014 (2 weeks)</td>
</tr>
<tr>
<td>Proponent releases approved PER Document</td>
<td>12 March 2014 (1 week)</td>
</tr>
<tr>
<td>Public Review of PER Document</td>
<td>9 April 2014 (4 weeks)</td>
</tr>
</tbody>
</table>
ENVIROMENTAL PROTECTION AUTHORITY

<table>
<thead>
<tr>
<th>EPA provides Summary of Submissions</th>
<th>30 April 2014 (3 weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proponent provides Response to Public Submissions</td>
<td>28 May 2014 (4 weeks)</td>
</tr>
<tr>
<td>OEPA reviews the proponent’s Response to Public Submissions</td>
<td>25 June 2014 (4 weeks)</td>
</tr>
<tr>
<td>OEPA assesses proposal for consideration by EPA</td>
<td>13 August 2014 (7 weeks)</td>
</tr>
<tr>
<td>Preparation and finalisation of EPA Report (including 2 weeks consultation on draft conditions with proponent and key Government agencies)</td>
<td>17 September 2014 (5 weeks)</td>
</tr>
</tbody>
</table>

Note - this time line is based on the EPA receiving adequate information. EAG 6 provides further timelines where adequate information is not provided.

### 2.5 Decision Making Authorities

At this preliminary stage, the EPA has identified the following decision making authorities (see Table 4). These DMAs are constrained from making any decision that could have the effect of causing or allowing the revised proposal to be implemented. Throughout the assessment process further DMAs may be identified.

#### Table 4: Nominated Decision Making Authorities

<table>
<thead>
<tr>
<th>Decision Making Authority</th>
<th>Relevant Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minister for Environment</td>
<td>Wildlife Conservation Act 1950</td>
</tr>
<tr>
<td>Minister for Water</td>
<td>Rights in Water and Irrigation Act 1914</td>
</tr>
<tr>
<td>Minister for State Development</td>
<td>Mineral Sands (Cooljarloo) Mining and Processing State Agreement 1988</td>
</tr>
<tr>
<td>Minister for Mines and Petroleum</td>
<td>Mining Act 1978</td>
</tr>
<tr>
<td>Department of Mines and Petroleum</td>
<td>Mining Act 1978</td>
</tr>
<tr>
<td>Minister for Indigenous Affairs</td>
<td>Aboriginal Heritage Act 1972</td>
</tr>
<tr>
<td>Department of Environment Regulation</td>
<td>Part V of the Environmental Protection Act 1986</td>
</tr>
<tr>
<td>Minister for Lands</td>
<td>Land Administration Act 1997</td>
</tr>
</tbody>
</table>

DMAs are not prevented from parallel processing, up to the point of their decision, so that their views can inform the ministerial consultation process.

### 2.6 Preparation of the Environmental Review Document

The generic guidelines for the format of an environmental review document can be downloaded from the EPA website www.epa.wa.gov.au.
When the EPA and the Commonwealth department administering the EPBC Act is satisfied with the standard of the environmental review document (see EAG 6 Section 4.4) the EPA will provide a written sign-off, giving approval to advertise the document for public review. The PER document may not be advertised for release before written approval is received. The proponent is responsible for advertising the release and availability of the PER document in accordance with the guidelines which will be issued to the proponent by the OEPA. The EPA must be consulted on the timing and details for advertising the document.

REFERENCE