Mr Sean McGunnigle  
Manager, Environmental Approvals  
Fortescue Metals Group Limited  
PO Box 6915  
EAST PERTH WA 6892

Dear Mr McGunnigle

CHRISTMAS CREEK IRON ORE EXPANSION - ENVIRONMENTAL SCOPING DOCUMENT

The Environmental Scoping Document (ESD) for the Christmas Creek Expansion Project was considered by the Environmental Protection Authority (EPA) at meeting number 1063 on 17 April 2014. The approved ESD is for the preparation of the Public Environmental Review (PER) is enclosed.

In considering the scoping document, the EPA raised concerns about the displacement of conservation significant fauna, due to the loss of suitable habitat for the species. The EPA noted that Fortescue Metals Group Limited (FMG) intends to backfill the pits to above pre-mining ground water levels to prevent the formation of permanent pit lakes.

In addition to the requirements outlined in the scoping document, please note the following points:

- The EPA strongly encourages data sharing and development of a sustainable solution for water use in cooperation with other proponents in the catchment.
- The content of the ESD is consistent with your intention to backfill to above pre-mining groundwater levels. Should the proposal change to include permanent pit lakes you would need to undertake additional work as part of the PER, similar to that required for other proposals (eg Nyidinghu).
- All flora/vegetation and fauna surveys should encompass the entire development envelope and, if applicable, any extended area of potential indirect impact, eg from groundwater drawdown or re-injection.
- The proposed areal extent of clearing is of particular concern to the EPA and FMG should clearly demonstrate that you have applied the mitigation hierarchy to minimise the disturbance footprint.
I note from the agreed assessment milestones in the ESD that you intend to submit a first draft of the PER at the end of May 2014. You need to demonstrate that you have adequately addressed all the work requirements outlined in the ESD for the EPA to authorise the release of the PER for public review.

If you have any queries please contact Peter Walkington on 9145 0836, quoting the reference number above.

Yours sincerely

[Signature]

Dr Paul Vogel
CHAIRMAN

17 May 2014

Encl.
ENVIRONMENTAL SCOPING DOCUMENT

PROPOSAL: Christmas Creek Iron Ore Mine Expansion (Assessment No. 1989)

LOCATION: Approximately 111 kilometres (km) north-east of Newman

LOCALITY: Shire of East Pilbara

PROPONENT: Fortescue Metals Group Limited

LEVEL OF ASSESSMENT: Public Environmental Review with a 4 week public review period

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 to be addressed are identified in Section 2.

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 Environmental Protection Authority (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. The Minister for Environment will then decide whether or not the proposal may be implemented, and, if the proposal may be implemented, the conditions and procedures that implementation of the proposal should be subject.

The level of assessment for this proposal was set on 24 November 2013. The procedure for this PER assessment 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).
This proposal is also being assessed under the EPBC Act. 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 needs to be assessed and approved by the Commonwealth before it can proceed. This proposal has been determined to be a controlled action (EPBC 2013/7055) under the EPBC Act as it has or is likely to have a significant impact on listed threatened species and ecological communities and listed migratory species.

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

The PER document should contain a separate section identifying MNES that occur or have the potential to occur within the project area, discussing how any potential impacts on MNES have been avoided and mitigated and discussing any proposed offsets to address significant residual impacts on MNES. 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 Environment Minister 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, including MNES, that should be addressed in preparing the PER document; and
- identify the necessary impact predictions required for an assessment of the proposal, and the information on the environmental setting required to carry out the assessment.

The EPA has determined that it will prepare and issue the ESD outlining the scope and content of the PER 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. The Office of the EPA (OEPA) provides services and facilities for the EPA. In many cases the OEPA will facilitate the gathering of information for 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. The proponent must also take due care to ensure that any other relevant environmental matters 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 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 preliminary key environmental factors that are relevant to the proposal specified below (section 2.2).

The proposal that is the subject of this assessment is Fortescue Metals Group Limited’s (Fortescue’s) proposed Christmas Creek Iron Ore Mine Expansion (Figure 1). The proposal is located approximately 111 km north-north-east of the town of Newman.

The proposal is for the expansion of the existing Christmas Creek mine for the development of an open-cut, strip mining iron ore mine, targeting Banded Iron Formation (BIF) material, to produce three products; Fortescue Blend, Special Fines and Rocket Fines. The mine life is currently estimated at approximately 14 years, to 2028, with approximately 889 million tonnes (Mt) of ore being mined, at an average rate of 55 Mtpa, incorporating peaks up to 66 Mtpa.
Approximately 3,800 Mt of waste rock material from the mine will be sent to dedicated in-pit or external waste rock storage facilities (WRSF). The expanded mine pit zone (Figure 2) covers an area approximately 42 km long, by 8 km wide at its widest point, and consists of multiple mine pits which are generally between 1 and 3 km in length and width, with an average depth of approximately 60 m.

The Christmas Creek ore processing facility (OFF) will produce iron ore at an expected long term production rate between 46 and 55 Mt per annum (Mtpa). Tailings will be produced at an average rate of 9-11 Mtpa. Over the life of the mine, Christmas Creek may produce up to 85 Mtpa in peak periods, in response to market or operational requirements.

Mine dewatering, injection of surplus water, and water production will be required.

To support the mine, the following infrastructure is proposed to be developed:

- Expansion of the ore processing facilities;
- Additional remote crushing hubs and conveyors;
- Additional mobile crushing and screening.
- Expansion of the waste rock storage facilities, growth medium storage areas and tailings storage facilities;
- Additional power lines;
- Additional roads and borrow pits;
- Additional surface water management infrastructure including diversion of minor creek flood lines, drains and embankments;
- Additional water bores, injection borefields, reticulation, transfer, storage and settlement ponds, evaporation basins and pipeline infrastructure;
- Expansion of accommodation facilities and wastewater treatment plants;
- Additional bulk and satellite fuel storage and dispensing facilities and expansion of existing facilities; and
- Additional laydown and storage facilities.
Table 1 – Key Characteristics Table

Summary of the proposal

<table>
<thead>
<tr>
<th>Proposal Title</th>
<th>Christmas Creek Iron Ore Mine Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proponent Name</td>
<td>Fortescue Metals Group Limited</td>
</tr>
<tr>
<td>Short Description</td>
<td>The proposal is for the expansion of the Christmas Creek Mine and includes modification/expansion or development of additional:</td>
</tr>
<tr>
<td></td>
<td>- mine pits</td>
</tr>
<tr>
<td></td>
<td>- ore stockpiles</td>
</tr>
<tr>
<td></td>
<td>- remote crushing hubs and conveyors</td>
</tr>
<tr>
<td></td>
<td>- mobile crushing and screening</td>
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<tr>
<td></td>
<td>- ore processing facilities and train loading facilities</td>
</tr>
<tr>
<td></td>
<td>- waste rock storage facilities</td>
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<tr>
<td></td>
<td>- tailings storage facilities</td>
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<tr>
<td></td>
<td>- growth medium storage areas</td>
</tr>
<tr>
<td></td>
<td>- power lines</td>
</tr>
<tr>
<td></td>
<td>- roads and borrow pits</td>
</tr>
<tr>
<td></td>
<td>- surface water management infrastructure</td>
</tr>
<tr>
<td></td>
<td>- water bores, injection borefields, reticulation, transfer, storage and settlement ponds, evaporation basins and pipeline infrastructure</td>
</tr>
<tr>
<td></td>
<td>- desalination plant</td>
</tr>
<tr>
<td></td>
<td>- accommodation facilities and wastewater treatment plants</td>
</tr>
<tr>
<td></td>
<td>- bulk and satellite fuel storage</td>
</tr>
<tr>
<td></td>
<td>- laboratory, warehouses, laydown area, workshops, maintenance facilities</td>
</tr>
<tr>
<td></td>
<td>- explosives and chemical storage</td>
</tr>
<tr>
<td></td>
<td>- administration buildings</td>
</tr>
<tr>
<td></td>
<td>- laydown and storage facilities</td>
</tr>
</tbody>
</table>

Physical Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Location</th>
<th>Existing approval</th>
<th>Proposed Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine pits and associated infrastructure</td>
<td>Figure 2 Statement 707</td>
<td>Clearing up to 10,135.5 ha</td>
<td>Clearing of no more than 18,335 ha*</td>
</tr>
<tr>
<td></td>
<td>Mine Development Clearing up to 18,335 ha*</td>
<td>Development envelope undefined</td>
<td>Development envelope of 33,000 ha* (includes the injection zone)</td>
</tr>
<tr>
<td></td>
<td>Mine Envelope and Disturbance Zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mine Infrastructure Envelope</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: During the assessment the proponent will need to demonstrate that all practicable measures have been taken to minimise the area of clearing and reduce the Mine Development Envelope based on progress in the proposal design and understanding of the environmental impacts.
## Operational Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Location</th>
<th>Existing approval</th>
<th>Proposed Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dewatering</td>
<td>Figure 3 Injection and Dewatering Zones</td>
<td>Statement 871</td>
<td>Up to 110 GLpa.</td>
</tr>
<tr>
<td>Water supply</td>
<td></td>
<td></td>
<td>Up to 25 GLpa, supplied from mine dewatering, desalination, transfer from nearby mine sites and an external water supply borefield.</td>
</tr>
<tr>
<td>Injection of surplus water from dewatering</td>
<td>Figure 3 Indicative Injection Zone</td>
<td>Statement 871</td>
<td>Up to 110 GLpa of surplus water.</td>
</tr>
<tr>
<td>Waste Rock</td>
<td>Figure 2 Indicative Waste Rock Zone</td>
<td></td>
<td>Disposal of up to 322 million tonnes per annum (Mtpa) to WRSFs to a life of project maximum of 3,800 million tonnes. Note: approximately 213 Mtpa of waste rock is currently produced at the existing operation.</td>
</tr>
<tr>
<td>Tailings Storage Facility</td>
<td>Figure 2 Indicative Tailings Zone</td>
<td></td>
<td>Disposal of up to 11 Mtpa to TSFs to the life of project maximum of 144 million tonnes. Note: approximately 4 Mtpa of tailings is currently produced at the existing operation.</td>
</tr>
<tr>
<td>Mine pits</td>
<td>Figure 2 Pit backfilling</td>
<td>Statement 707</td>
<td>Mine pits will be backfilled so that the final surface levels are at a higher elevation than the pre-mining groundwater levels.</td>
</tr>
</tbody>
</table>

*Note: If an external water supply borefield is required, approvals will be progressed separately to this Proposal*
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. The EPA has identified the preliminary key environmental factors, objectives and work required as detailed in Table 2.

The EPA has also identified a list of relevant policy documents (see Table 2) which set out how the EPA expects the proponent to consider the preliminary key environmental factors. The EPA expects that the treatment of preliminary key environmental factors will be consistent with the approaches set out in these policy documents. The proponent must clearly demonstrate how they have designed the proposal in accordance with the mitigation hierarchy (avoid, minimise, mitigate/rectify, and offset, if required). 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 environmental factors relevant to the proposal:

- flora and vegetation
- terrestrial fauna
- subterranean fauna
- hydrological processes
- inland waters environmental quality
- rehabilitation and mine closure (integrating factor)
- offsets (integrating factor).

Table 2: Preliminary key environmental factors relevant to the proposal

<table>
<thead>
<tr>
<th>EPA objective</th>
<th>Flora and Vegetation</th>
</tr>
</thead>
<tbody>
<tr>
<td>To maintain representation, diversity, viability and ecological function at the species, population and community level.</td>
<td></td>
</tr>
<tr>
<td>Potential impacts</td>
<td></td>
</tr>
<tr>
<td>The proposal involves the additional clearing of up to 8,200 ha of native vegetation for the mine and supporting infrastructure.</td>
<td></td>
</tr>
<tr>
<td>Indirect impacts on flora and vegetation may result from groundwater drawdown, injection of surplus water, altered water quality and regimes, dust deposition, altered fire patterns, and spread of weeds. If pit lakes form, in the long term there may be impacts from a saline plume affecting groundwater.</td>
<td></td>
</tr>
<tr>
<td>The development envelope overlaps a proposed conservation reserve (portions of Mulga Downs, Hillside, Marillana and Roy Hills are proposed for exclusion from pastoral leases in 2015).</td>
<td></td>
</tr>
<tr>
<td>Work required</td>
<td></td>
</tr>
<tr>
<td>Provide a detailed description of the cumulative impacts associated with the proposal, including direct impacts from clearing, and indirect impacts such as groundwater drawdown, groundwater mounding, surface discharge of excess groundwater, altered drainage, changes in water quality, dust emissions and fragmentation of vegetation. Show how and to what extent clearing and indirect impacts will affect the 2015 Pastoral Exclusion Area proposed and agreed by Government to be acquired for conservation purposes.</td>
<td></td>
</tr>
<tr>
<td>Provide figures showing the extent of clearing and indirect impact to vegetation and</td>
<td></td>
</tr>
</tbody>
</table>
conservation significant flora species, including but not limited to threatened and/or priority ecological communities, declared rare flora, priority flora and new flora species.

Consolidate vegetation and flora reports incorporating information from all relevant previous and new studies.

Carry out Level 2 flora and vegetation surveys in areas that are likely to be directly or indirectly disturbed as a result of the proposal including Level 2 vegetation surveys of the proposed injection infrastructure zone. Surveys are to be undertaken in accordance with Guidance Statement 51 and, where available, species-specific survey guidelines for relevant species listed under the EPBC Act. Details of the scope, timing (survey season/s) and methodology for surveys used must be provided. Follow up targeted surveys may be required based on the results of the baseline survey for conservation significant flora and vegetation.

Analyse the extent of clearing and indirect impacts to assist in the determination of the significance of impacts, including impacts on:
- vegetation units
- threatened and priority ecological communities
- threatened and priority flora
- species identified as significant consistent with Guidance Statement 51
- vegetation units identified as significant consistent with Guidance Statement 51
- groundwater dependent vegetation
- proposed conservation reserve (2015 Pastoral Exclusion Area)

Undertake baseline mapping of weed affected areas in any area likely to be directly or indirectly impacted by the proposal.

Discuss proposed management, monitoring and mitigation methods to be implemented.

During the assessment the proponent will need to demonstrate that all practicable measures have been taken to reduce the area of the Mine Development Envelope based on progress in the proposal design and understanding of the environmental impacts and with a view to minimising impacts on other land users.

### Relevant policy/guidance documents

- Position Statement 2 Environmental Protection of Native Vegetation in Western Australia.
- Position Statement 3 Terrestrial Biological Surveys as an Element of Biodiversity Protection.
- EPA (2013) Environmental and water assessments relating to mining and mining-related activities in the Fortescue Marsh management area. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986. EPA Report 1484 July 2013.
- Checklist for documents submitted for EIA on marine and terrestrial biodiversity.

### Terrestrial Fauna

**EPA objective**

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

**Potential impacts**

Clearing of vegetation would result in loss or fragmentation of fauna habitat and consequential loss and displacement of fauna.

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

Indirect impacts may occur through altered fire regimes, groundwater drawdown and injection of surplus water, altered water regimes, changes to feral animal populations,
Work required

Conduct desktop study of information available to provide a comprehensive listing of vertebrate fauna and SRE invertebrate fauna known or likely to occur in the habitats present, and identification of conservation significant fauna species likely to occur in the area. Consideration of species listed under both the WA Wildlife Conservation Act 1950 and the EPBC Act, and species listed by DPaW as Priority Fauna to include, but not necessarily be limited to the following threatened species:

- Night Parrot (*Pezoporus occidentalis*);
- Northern Quoll (*Dasyurus hallucatus*)
- Pilbara leaf-nosed bat (*Rhinonicteris aurantia*, Pilbara form)
- Greater Bilby (*Macrotis lagotis*)
- Olive Python (Pilbara subspecies) (*Liasis olivaceus barroni*)
- Great Egret, White Egret (*Ardea alba*)
- Any priority Fauna species identified in a Level 1 survey as likely to occur in the proposal area.

For each relevant conservation significant species, provide baseline information on their abundance (including known occurrences), distribution, ecology, and habitat preferences at both the site and regional levels.

Conduct a Level 1 reconnaissance vertebrate and SRE invertebrate fauna survey and mapping of habitats including specialised habitats associated with Fortescue Marsh, identification and mapping of important, rare or unusual habitat types within areas to be impacted, in accordance with Guidance Statements 56 and 20. This should also consider other areas outside the proposed impact footprint to determine whether the most suitable areas have been chosen for location of infrastructure.

Particular consideration should be given to habitat types that provide important ecological function e.g. riparian vegetation, protected area buffer zones, refugia, important habitat corridors, wetlands, areas of conservation significance or geological features which may support unique ecosystems. Analyse the extent of clearing, including percentages of habitat types to be cleared or otherwise impacted, to assist in determination of significance of impacts. Information, including maps, must also differentiate habitat on the basis of use e.g. breeding habitat, migration pathways, feeding habitat. Consider whether the remaining habitat has adequate carrying capacity.

Conduct Level 2 fauna surveys in areas that are likely to be directly or indirectly impacted as a result of the proposal. Surveys are to be undertaken in accordance with Guidance Statements 20 and 56 and, where available, species-specific survey guidelines for relevant species listed under the EPBC Act. Additional targeted surveys for conservation significant fauna that are known to or likely to occupy habitats in the project area may be required based on the results of the survey.

For each relevant conservation significant species, provide:

- information on the conservation value of each habitat type from a local and regional perspective, including the percentage representation of each habitat type on site in relation to its local and regional extent; and

- if a population of a conservation significant species is present on the site, its size and the importance of that population from a local and regional perspective and potential percentage loss of the conservation significant species locally due to loss of habitat.

Discuss known existing threats to the species, whether or not attributable to the proposed action, with reference to relevant impacts from the proposed action (including taking into consideration any relevant guidelines, policies, plans and statutory provisions).

Discuss potential direct/indirect (including downstream) and cumulative impacts to fauna as a result of the proposal, and provide quantitative data on impacts of the proposal to species of conservation significance.

Where vegetation to be cleared provides habitat for EPBC listed species, provide an
assessments of habitat quality in terms of site condition and context and species stocking rate, as described in the EPBC Act Offsets Assessment Guide.

For all conservation significant species that are not likely to be impacted by the proposed action, but for which suitable habitat is present and could be impacted by the proposed action, detailed information must be included to demonstrate that an impact on the species will not or is unlikely to occur.

Discuss proposed management, monitoring and mitigation methods to be implemented including an assessment of the effectiveness of the methods, any statutory or policy basis for the methods.

<table>
<thead>
<tr>
<th>Relevant policy/guidance documents</th>
<th>Guidance Statement No. 20 Sampling of Short Range Endemic Invertebrate Fauna for Environmental Impact Assessment in Western Australia.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Position Statement 3 Terrestrial Biological Surveys as an Element of Biodiversity Protection.</td>
</tr>
<tr>
<td></td>
<td>Department of Water (2009) Pilbara Water in Mining Guideline Report No.34</td>
</tr>
<tr>
<td></td>
<td>EPA (2013) Environmental and water assessments relating to mining and mining-related activities in the Fortescue Marsh management area. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986. EPA Report 1484. July 2013.</td>
</tr>
<tr>
<td></td>
<td>Species-specific recovery plans, survey guidelines and threat abatement plans for relevant species listed under the EPBC Act (obtained from the Australian Government’s Species Profile and Threats Database at <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>Checklist for documents submitted for EIA on marine and terrestrial biodiversity.</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**

Direct mortality and loss of habitat through sub-surface disturbance, abstraction of groundwater and injection of excess groundwater.

**Work required**

- Conduct surveys within areas to be impacted and in surrounding areas in accordance with Guidance Statement 54a.
- Present the results of the subterranean fauna surveys and discuss the potential for direct and indirect impacts to subterranean fauna including consideration of altered water regimes and nutrient flows.
- Discuss proposed management, monitoring and mitigation methods to be implemented.

**Relevant policy/guidance documents**

- Environmental Assessment Guideline 12 Consideration of subterranean fauna in environmental impact assessment in Western Australia June 2013.
- Guidance Statement No. 54a Sampling methods and survey considerations for subterranean fauna in Western Australia July 2007.
- Department of Water (2009) Pilbara Water in Mining Guideline Report No.34
- EPA (2013) Environmental and water assessments relating to mining and mining-related activities in the Fortescue Marsh management area. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986. EPA Report 1484. July 2013.
- Checklist for documents submitted for EIA on marine and terrestrial biodiversity.
### 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** | Impacts to natural surface water flows as a result of placement, design and operation of new mine and rail infrastructure. Altered flow regime to the Fortescue Marsh due to groundwater drawdown and injection of excess water. Cumulative impact due to similar activities of other mines operating in the area. Impacts of injection of excess water include:  
  - localised mounding of groundwater;  
  - surface expression of discharged water;  
  - altered groundwater quality depending on the quality of water injected; and  
  - erosion around infrastructure. Impacts to any groundwater dependent ecosystems and subterranean fauna, as a result of groundwater drawdown and mounding due to injection. |
| **Work required** | Provide a detailed description of the design and location of the proposal with the potential to impact surface water or groundwater. Characterise baseline hydrological and hydrogeological regimes. Develop a conceptual model of the surface and groundwater systems, incorporating the extent of connectivity between surface and ground water systems. Discuss effectiveness of current water management scheme and provide comparison of its actual operation versus what was predicted including discussion of accuracy. Also detail any problems with how the system has operated and what management measures have been taken where it is not operating as expected. Investigate groundwater drawdown, and mounding due to ground water abstraction and injection associated with the proposal. Analyse and discuss any impacts to groundwater levels and flows taking into consideration the cumulative impacts with other proposals. Have groundwater modelling for this assessment independently peer reviewed at each stage of the modelling. Determine the following in consultation with the Department of Water:  
  - the scope and timing of pump tests and surveys to determine geological cross sections;  
  - the scope and timing of each stage of the modelling; and  
  - the selection of the independent peer reviewer;  
The modelling should be consistent with Australian Government National Water Commission’s *Australian Groundwater Modelling Guidelines* (2012). Analyse, discuss and assess surface water and groundwater impacts associated with the proposal together with cumulative impacts with other projects and referred proposals (including the BHPBIO strategic proposal) for which relevant information is publicly available. Discuss the proposed management, monitoring and mitigation to prevent groundwater and surface water impacts as a result of implementing the proposal. |
| **Relevant policy/guidance documents** | *Rights in Water and Irrigation Act (1914).*  
EPA (2013) Environmental and water assessments relating to mining and mining-related
activities in the Fortescue Marsh management area. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986. EPA Report 1484. July 2013.

### Inland Waters Environmental Quality

<table>
<thead>
<tr>
<th>EPA objective</th>
<th>To maintain the quality of groundwater and surface water, sediment and/or biota so that the environmental values, both ecological and social, are protected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential impacts</td>
<td>Surface drainage systems in the Fortescue Marsh catchment will be disrupted by mine pits, surface waste dumps and stock piles, and drainage structures.</td>
</tr>
<tr>
<td></td>
<td>Dewatering and injection of excess groundwater has the potential to change groundwater chemistry.</td>
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<tr>
<td></td>
<td>Pit lakes left by the proposal have the potential to change the ground water quality over time.</td>
</tr>
<tr>
<td></td>
<td>Without appropriate management of waste dumps containing at-risk material (material with potential for acid or metalliferous drainage), there is the potential for contamination of surface water and groundwater.</td>
</tr>
<tr>
<td>Work required</td>
<td>Characterise baseline hydrological regimes and water quality.</td>
</tr>
<tr>
<td></td>
<td>Develop a conceptual model of the surface and groundwater systems, incorporating groundwater quality and the extent of connectivity between surface and ground water systems and Fortescue Marsh.</td>
</tr>
<tr>
<td></td>
<td>Undertake a hydrological investigation to determine what effect groundwater abstraction, injection and modified drainage will have on the surface water and groundwater quality and quantity of the area.</td>
</tr>
<tr>
<td></td>
<td>Have hydrological modelling for this assessment independently peer reviewed at each stage of the modelling. The scope of the modelling, timing of each stage of the modelling and the independent peer reviewer should be endorsed by the Department of Water. The modelling should be consistent with Australian Government National Water Commission’s Australian Groundwater Modelling Guidelines (2012).</td>
</tr>
<tr>
<td></td>
<td>Undertake a comprehensive review of surface water and groundwater quality collected from the existing mining operation at the site. Identify any adverse changes caused by the mining operation and outline avoidance, minimisation and management methods to be used to prevent further impacts.</td>
</tr>
<tr>
<td></td>
<td>Complete waste characterisation studies of waste rock and other materials and carry out an acid and metalliferous drainage risk assessment.</td>
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<tr>
<td></td>
<td>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 quality.</td>
</tr>
<tr>
<td></td>
<td>Model cumulative impacts with other mines in the catchment (currently operating and referred proposed mines, including the BHPBIO strategic proposal, where information is publicly available). Develop strategies and controls to minimise the impacts.</td>
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<tr>
<td></td>
<td>Confirm whether or not pit lakes may form and provide details of potential backfill options. If pit lakes may form, provide an assessment of the long term contamination of any pit lakes remaining after mining and the potential impact on groundwater and surface water quality with particular attention to possible impacts on Fortescue Marsh.</td>
</tr>
<tr>
<td></td>
<td>Discuss proposed management, monitoring and mitigation methods to be implemented during construction, operation and following closure to ensure that the EPA’s objective for this factor is met.</td>
</tr>
</tbody>
</table>
### Relevant policy/guidance documents

### EPA objective
To ensure that premises can be 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
The proposal is under a State Agreement Act (Iron Ore (FMG Chichester Pty Ltd) Agreement Act 2006) and as such rehabilitation and closure cannot be regulated and managed by the Department of Mines and Petroleum.

The proposal will impact on an area identified for exclusion from the pastoral leases in 2015 which is proposed to be included in the conservation estate. It will also impact on Fortescue Marsh Management Zones listed in the EPA's strategic advice on mining-related assessments in the Fortescue Marsh area (EPA, 2013).

Should there be poor rehabilitation and mine closure planning and management practices there could be a number of undesirable impacts to the receiving environment, such as:
- unauthorised vegetation disturbance;
- depletion of topsoil resources;
- compacted soil layers with poor infiltration rates;
- the formation of pit lakes which may attract and harm wildlife, birds or stock;
- the introduction of weeds to rehabilitated areas;
- landscape modification, altered hydrology and other ecosystem impacts;
- unstable landforms and adverse dust impacts;
- poor return of native vegetation and flora species; and
- contamination.

### Work required
Desktop study of successful and unsuccessful rehabilitation strategies and outcomes in similar geologies and vegetation types in the Pilbara. Including a discussion of the different methodology and success rates for the various proposed disturbance types including:
- created landforms (e.g. waste rock dump, tailings storage facility)
- short-term disturbances (e.g. borrow pits and access tracks)
- long-term disturbances (e.g. construction camp, permanent accommodation village and administration buildings)
- linear and/or fragmentation disturbances (e.g. roads, power lines, bore fields)

Provide waste characterisation work including static and kinetic test results and water quality monitoring results for drainage from existing waste storage facilities to enable a thorough assessment of Acid and Metalliferous Drainage risk posed by the project. If Potentially Acid Forming (PAF) material is identified, provide mine scheduling detail to demonstrate that PAF material is not disturbed during mining and/or that effective strategies will be in place to ensure PAF material is adequately managed should it be exposed and/or disturbed.

Provide the physical characteristics of the waste materials and proposed locations and geotechnical design detail (including slope stability) for the waste landforms, including the WFSFs. Identify proposed management and monitoring for the waste landforms.
Describe contingencies to make landforms secure and non-polluting in the event of unexpected or temporary closure.

Prepare a Rehabilitation and Mine Closure Plan consistent with the Department of Mines and Petroleum (DMP) and EPA Guidelines for Preparing Mine Closure Plans. Include completion criteria and closure objectives addressing native vegetation and habitat for significant flora and fauna. Consult with the Department of Parks and Wildlife on rehabilitation and closure objectives within the proposed conservation reserve. Establish and measure vegetation and fauna reference sites to inform completion criteria. Determine requirements for, and sources of, soil and seed for rehabilitation. A conclusive discussion on backfill options (including ‘worst case scenario’) is also required.

If pit lakes may form, provide an assessment of the potential for long term contamination of any pit lakes remaining and the potential impacts on groundwater quality and surface water quality.

Discuss proposed management, monitoring and mitigation methods to be implemented including post-mining land use and areas to be rehabilitated.

Discuss proposed monitoring of linkages of specialised habitats to demonstrate that rehabilitated areas function as ecological corridors for conservation significant fauna.

**EPA objective**

To counterbalance any significant residual environmental impacts and/or uncertainty through the application of offsets.

**Potential impacts**

Potential impacts on vegetation, flora, habitat and fauna species of State and National significance.

**Work required**

Examine residual impacts and, if required, develop a draft program of environmental offsets that adheres to the relevant policy/guidance documents listed below.

Identify residual impacts with regard to MNES and assess the significance of the impacts.

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

**Relevant policy/guidance documents**

- EPA (2013) Environmental and water assessments relating to mining and mining-related activities in the Fortescue Marsh management area. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the Environmental Protection Act 1986. EPA Report 1484. July 2013.
- Govt of WA (2011) WA Environmental Offsets Policy.
- EPA Offsets Reporting Form.
These preliminary key factors must be addressed within the environmental review document for the public to consider the impacts of the proposal and make comment to the EPA. The EPA anticipates that it will address these factors in its report to the Minister for Environment. 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.

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.

- Air quality
- Amenity
- Human health
- Heritage

Air quality – 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.

Dust impacts on vegetation and flora should be addressed in the environment review document through an assessment of the indirect impacts of the proposal on flora and vegetation.

Amenity – There are no noise sensitive premises in proximity to the mine area that are likely to be significantly impacted by the proposal. Noise impacts that may affect human amenity can be adequately managed under Part V of the EP Act. The environmental review document should assess any noise impacts from the proposal on fauna as part of the assessment of the impacts on terrestrial fauna.

Human Health – There are no receptors in proximity to the project that are likely to experience human health impacts from dust, aside from employees working at the mine. The prevention of impacts to employees can be effectively managed by the Department of Mines and Petroleum Resources Safety Division through the Mines Safety and Inspection Act 1994.

Heritage - A Land Access Agreement is in place between FMG and the Nyiyaparli People for the existing mine. Also management operates under the Fortescue Cultural Heritage Management Plan and the proponent has legal obligations under the Aboriginal Heritage Act 1972.

If during the course of the preparation of the document other potential issues are identified, these issues should be discussed with the OEPA to determine whether they are to be addressed in the PER.
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 Department of Water;
- Works Approvals and Licenses required from the Department of Environment Regulation; and

4 Agreed Assessment Milestones

EPA Environmental Assessment Guideline No. 6 “Timelines for EIA of Proposals” 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 and the timeline adjusted.

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 3: Agreed Milestones for the proposal

<table>
<thead>
<tr>
<th>Key Stage of Proposal</th>
<th>Agreed Milestone</th>
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</thead>
<tbody>
<tr>
<td>EPA approval of ESD Document</td>
<td>This Document</td>
</tr>
<tr>
<td>Proponent submits first adequate draft of PER Document</td>
<td>End May 2014</td>
</tr>
<tr>
<td>OEPA provides comment on first draft PER Document</td>
<td>6 weeks Early July 2014</td>
</tr>
<tr>
<td>Proponent submits adequate revised draft PER Document</td>
<td>4 weeks Early August 2014</td>
</tr>
<tr>
<td>EPA authorises release of PER Document</td>
<td>2 weeks Mid August 2014</td>
</tr>
</tbody>
</table>
### Key Stage of Proposal | Agreed Milestone
--- | ---
Proponent releases approved PER Document | 1 Week  
Late August 2014
Public Review of PER Document | 4 weeks  
Late September 2014
EPA provides Summary of Submissions | 3 Weeks  
Mid October 2014
Proponent provides adequate Response to Public Submissions | 4 Weeks  
Mid November 2014
OEPA reviews Response to Submissions | 4 weeks  
Mid December 2014
OEPA assesses proposal for consideration by EPA | 7 weeks (+ additional 2 weeks for Christmas)  
Early March 2015
Preparation and finalisation of EPA Report (including 2 weeks consultation on draft conditions with proponent and key Government agencies) | 5 weeks  
Mid April 2015

### 5 Decision Making Authorities
At this preliminary stage, the EPA has identified the following decision making authorities (DMAs) (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>
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</thead>
<tbody>
<tr>
<td>Minister for Environment</td>
<td><em>Wildlife Conservation Act 1950</em></td>
</tr>
<tr>
<td>Department of Environment Regulation</td>
<td><em>Part V of the Environmental Protection Act 1986</em></td>
</tr>
<tr>
<td>Minister for Water</td>
<td><em>Rights in Water and Irrigation Act 1914</em></td>
</tr>
<tr>
<td>Minister for Mines and Petroleum</td>
<td><em>Mining Act 1978</em></td>
</tr>
<tr>
<td>Minister for State Development</td>
<td><em>Iron Ore (FMG Chichester Pty Ltd) Agreement Act 2006</em></td>
</tr>
<tr>
<td>Minister for Aboriginal Affairs</td>
<td><em>Aboriginal Heritage Act 1972</em></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.
6 Preparation of the Environmental Review Document

The recommended format for the Environmental Review document is enclosed as Attachment 1.

When the EPA is satisfied with the standard of the environmental review document it will provide a written sign-off, giving approval to advertise the document for public review. The review 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 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.
Figure 1 - Location of Proposal
Figure 2 – Mine development envelope, disturbance footprint and mine infrastructure zones