Report and recommendations of the Environmental Protection Authority

Jimblebar Optimisation Project

BHP Billiton Iron Ore Pty Ltd

Report 1663

January 2020

Environmental impact assessment process timelines

Date	Progress stages	Time (weeks)
27/09/2019	EPA decides to assess – level of assessment set	
21/11/2019	EPA board considered assessment	8
20/12/2019	EPA provided report to the Minister for Environment	4
06/01/2020	EPA report published	
20/01/2020	Close of appeals period	2

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the EPA decides to assess the proposal and records the level of assessment.

In this case, the Environmental Protection Authority met its timeline objective to complete its assessment and provide a report to the Minister.

Dr Tom Hatton
Chairman

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Summary

The Jimblebar Optimisation Project (the proposal) was referred to the Environmental Protection Authority (EPA) by BHP Billiton Iron Ore Pty Ltd (the proponent) in August 2019. The proposal is a revision of the existing Jimblebar Iron Ore Project and is to amend the existing proposal to provide additional areas for mining infrastructure (including overburden storage) and new surplus water management options for the Jimblebar Iron Ore Project. The proposal is located about 40 kilometres east of Newman in the Pilbara region of Western Australia.

The EPA assessed the proposal at the level of Referral Information and has concluded that the proposal is environmentally acceptable and can be implemented subject to conditions.

The existing Jimblebar Iron Ore Project is currently authorised under Ministerial Statements 683, 809 and 857 (as amended by Statement 1029). The EPA recommends that a contemporary Ministerial Statement referencing updated EPA guidance and incorporating all elements of the approved proposal as well as elements of this revised proposal replace these Ministerial Statements.

Ministerial Statement 1105 for the proponent's Pilbara Expansion Strategic Proposal provides a framework for conditions to apply to BHP proposals in the Pilbara region. The recommended contemporary Ministerial Statement has also been prepared using this framework

In the course of the assessment, the EPA examined potential impacts on the key environmental factors of Flora and Vegetation, Inland Waters, and Terrestrial Fauna.

The EPA has recommended conditions (Appendix 4) including implementation of environmental management plans and development of a mine closure plan. The EPA has also recommended conditions requiring the proponent to contribute funds to the Pilbara Environmental Offset Fund to counterbalance residual impacts to vegetation in 'Good' to 'Excellent' condition, including foraging habitat for the ghost bat.

Contents

Tables

Figures

1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for Environment on the outcomes of the EPA's environmental impact assessment of the proposal by BHP Billiton Iron Ore Pty Ltd (the proponent). The proposal is to amend existing operations at the Jimblebar Iron Ore Mine to develop additional overburden storage areas and change the management of surplus water. The proposal is located 40 kilometres (km) east of Newman (Figure 1) and is referred to as the Jimblebar Optimisation Project.

The EPA has prepared this report in accordance with s. 44 of the *Environmental Protection Act 1986* (EP Act). This section of the Act requires the EPA to prepare a report on the outcome of its assessment of a proposal and provide this assessment report to the Minister for Environment. The report must set out:

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

The EPA may also include any other information, advice and recommendations in the assessment report as it thinks fit.

The proponent referred the proposal to the EPA on 29 August 2019. On 23 September 2019, the EPA decided to assess the proposal and set the level of assessment at Referral Information.

1.1 EPA procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual 2018* (EPA 2018c).

2. The proposal

2.1 Proposal summary

The proponent, BHP Billiton Iron Ore Pty Ltd (BHP), proposes a change (referred to in this report as the 'proposal') to its approved projects to mine and process iron ore from the Jimblebar Iron Ore Project.

The approved project consists of the existing approved proposals:

- Wheelarra Hill Iron Ore Mine Extension Life-of-Mine Proposal (Ministerial Statement (MS) 683, 16 August 2005) – Life of Mine proposal to mine and crush iron ore within Mining Lease 266A at a rate of approximately 12 million tonnes per annum (Mtpa).
- Wheelarra Hill Mine Modification (MS 809, 7 October 2009) – Proposal to increase in the mining rate from approximately 12 Mtpa to 45 Mtpa.
- Jimblebar Iron Ore Project (MS 857, 18 February 2011) – Proposal to extend the existing Wheelarra Hill open pits, develop the South Jimblebar and Hashimoto deposits and increase the ore processing capacity by 30 Mtpa.

MS 1029 also applies to the Jimblebar Iron Ore Project. This statement provides for the application of offsets associated with a change under s. 45C of the EP Act to MS 857. The change was approved on 22 October 2015 and authorised an additional 258 hectares (ha) of clearing.

The current proposed change is to provide additional areas for mining infrastructure (including overburden storage) and new surplus water management options at Jimblebar. The location of the proposed change is shown in Figures 1 to 3.

The proposed change comprises the following additional activities and/or elements:

- New overburden storage areas and expansions to existing overburden storage areas.
- New haul roads including across Jimblebar Creek.
- New surplus water management options:
    - discharge of surplus mine dewater from Jimblebar mining operations into a new managed aquifer recharge (MAR) borefield east of Jimblebar (in Caramulla)
    - discharge of surplus mine dewater from Jimblebar mining operations into Caramulla Creek.
- New pipeline from Jimblebar mine to transfer surplus dewater from Jimblebar mining operations to new Caramulla MAR and Caramulla Creek.
- Small diversion of a creek tributary to maintain surface water flow to Copper Creek around the proposed new southern overburden storage areas.

The key characteristics of the revised proposal (i.e. the amalgamation of the existing approved projects and the proposed change) are summarised in Tables 1 and 2 below. A detailed description of the proposed change in relation to the existing approved projects is provided in section 2 of the Environmental Review Document (BHP 2019).

In undertaking this assessment, the EPA has assessed the impacts of the proposed change in the context of the approved project, considering the cumulative impacts of the entire revised proposal where appropriate.

Table 1: Summary of the proposal

Proposal title	Jimblebar Optimisation Project
Short description	The Revised Proposal is for mining operations at Jimblebar, located approximately 40 km east of the town of Newman Mining of iron ore deposits will be undertaken above and below the water table. Mining operations will include open pits, overburden storage areas and the construction and operation of associated mine, processing and rail infrastructure. Groundwater will be abstracted for water supply and to dewater the orebodies. Surplus water management will include transfer to Ophthalmia Dam, controlled creek discharge and managed aquifer recharge.

Table 2: Location and proposed extent of physical and operational elements

Element	**Location**	**Existing approvals** **(Ministerial Statement/s and other regulatory approvals)**	**Proposed change** **(this proposal)**	**Proposed extent** **(revised proposal)**
Physical elements				
Mine and associated infrastructure	Figures 1, 2 and 3	Clearing of up to a total of 4,902 ha: • Land disturbance area: Not more than 2,300 ha within the 8,324 ha development envelope and not more than 14 ha outside the development envelope for the	• Additional clearing of up to 2,000 ha of native vegetation. • Remove the 14 ha for clearing for pipeline outside the development envelope (from MS 857).	Clearing of no more than 6,902 ha of native vegetation within the development envelope of 14,206 ha.

Element	Location	Existing approvals (Ministerial Statement/s and other regulatory approvals)	Proposed change (this proposal)	Proposed extent (revised proposal)
		pipeline (MS 857). • Total area of disturbance: an additional 580 ha (maximum) (MS 809). • Area disturbed: 2,022 ha (MS 683).		
Operational elements				
Groundwater abstraction	Figures 1, 2 and 3	RiWI Act 5C Licence (GWL158795(9)) 22 gigalitres per annum (GL/a) (including for dewatering).	No change	Authorised under existing RiWI 5C licence
Surplus water management	Figures 1, 2 and 3	Construction of a 45 megalitres per day pipeline within existing disturbance corridors to convey excess dewatering discharge to the Ophthalmia Dam (MS 857). Part V Licence L5415/1988/9 (Amendment Notice 3) Category 6 Discharge capacity (Jimblebar component): • 3.65 GL/a reinjected (Jimblebar MAR scheme).	Additional surplus water management options including any or all of the following options: • Controlled discharge along Caramulla Creek to extend no further than 34 km from the northern boundary of the development envelope under natural, no-flow conditions.	Surplus water management including any or all of the following options: • Discharge of up to 16.425 GL/a to Ophthalmia Dam. • Controlled discharge along Caramulla Creek to extend no further than 34 km from the northern boundary of the development envelope

Element	Location	Existing approvals (Ministerial Statement/s and other regulatory approvals)	Proposed change (this proposal)	Proposed extent (revised proposal)
		• 2.19 GL/a discharged to Jimblebar Creek and Copper Creek. • 16.425 GL/a discharged to Ophthalmia Dam.	• Managed aquifer recharge in the Caramulla area to limit groundwater level rise to 25 m below ground level.	under natural, no-flow conditions. • Managed aquifer recharge in the Caramulla area to limit groundwater level rise to 25 m below ground level.

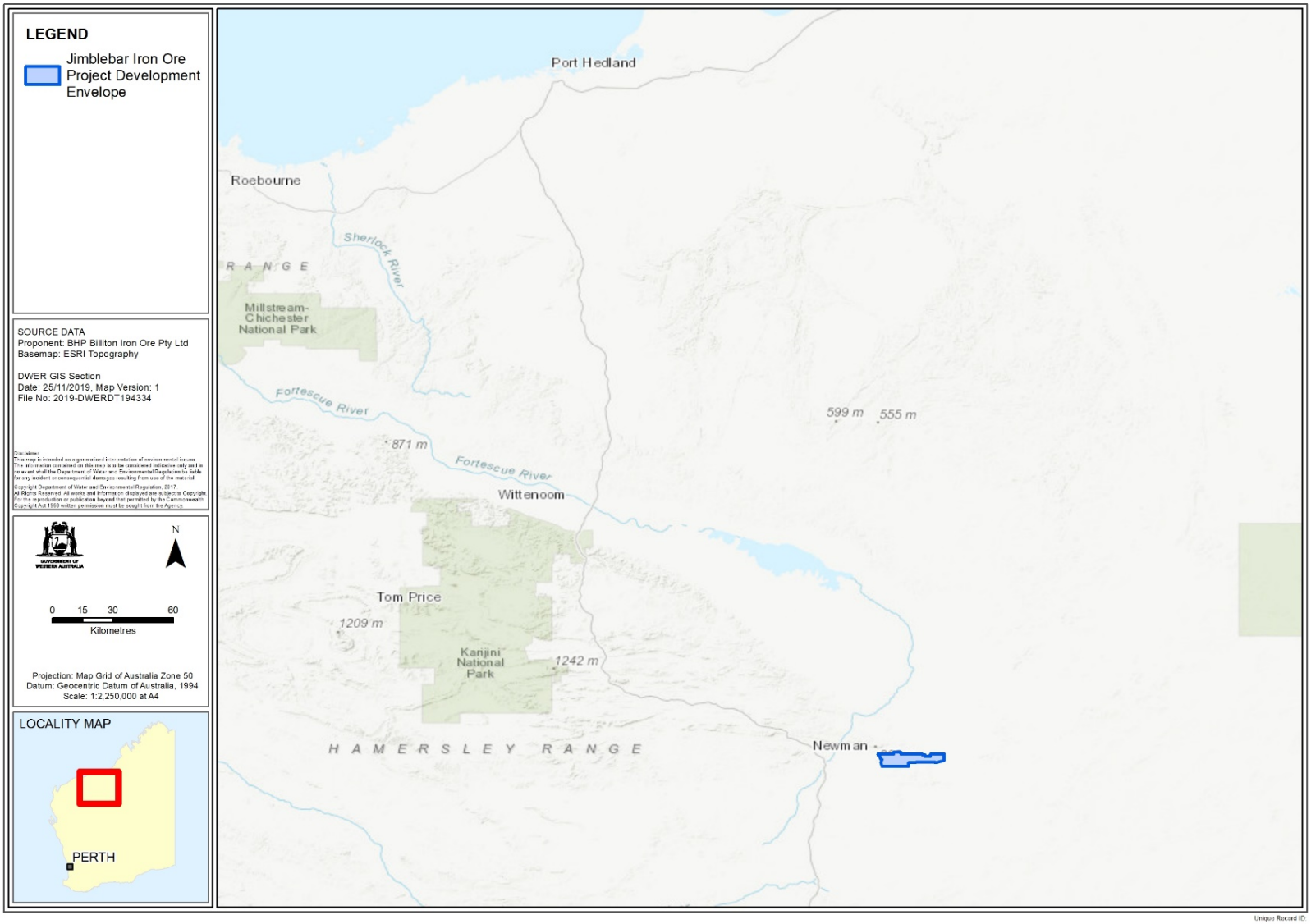

Figure 1: Regional location

Figure 2: Existing Ministerial Statement boundaries and proposed development envelope

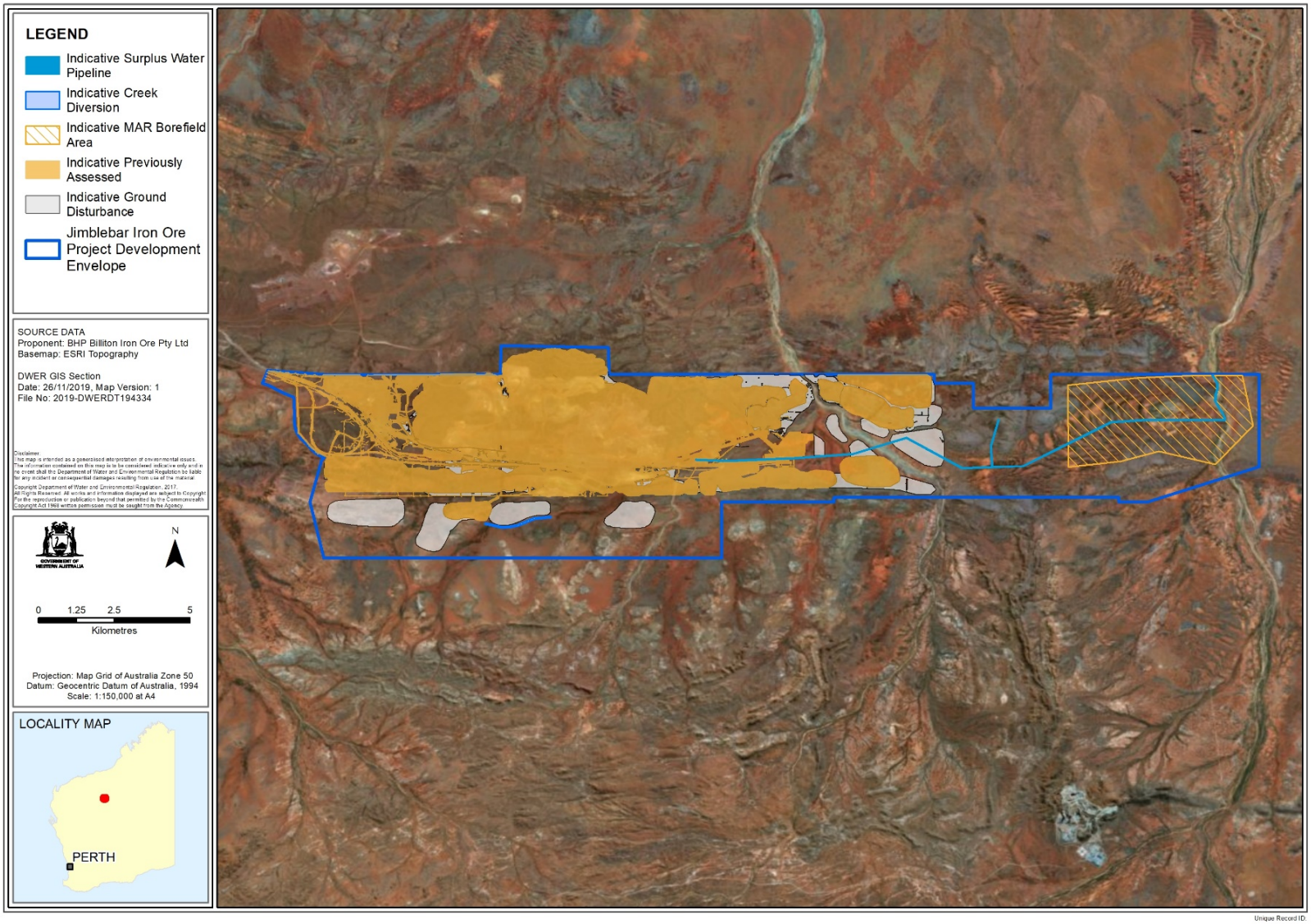

Figure 3: Indicative footprint

2.2 Context

The Jimblebar Optimisation Project is located in the Fortescue and Hamersley Interim Biogeographic Regionalisation for Australia (IBRA) subregions of the Pilbara bioregion and the Augustus subregion of the Gascoyne bioregion. The Jimblebar proposal is located within the Nyiyaparli native title determination area.

The proposal sits in the upper catchment of the Fortescue River, which flows into Fortescue Marsh. The Fortescue Marsh is listed in the Directory of Important Wetlands in Australia and is a proposed Ramsar site. The Fortescue Marsh is also listed as a Priority Ecological Community by the Department of Biodiversity, Conservation and Attractions. The nearest part of the Karijini National Park is located 147 km northwest of the proposal.

The Ethel Gorge Aquifer Stygobiont Threatened Ecological Community is located 20 km west of the proposal. Ophthalmia Dam, located five km upstream of Ethel Gorge, is operated as a managed aquifer recharge facility to manage groundwater levels in the Ethel Gorge aquifer. Water from the Jimblebar Iron Ore Project is currently discharged into Ophthalmia Dam, along with surplus water from other BHP proposals in the area.

Expansions to existing operations at the Jimblebar Iron Ore Project were identified in BHP's Pilbara Expansion Strategic Proposal, which has been assessed by the EPA (Report 1619). BHP did not request that the Jimblebar Optimisation Project be declared a derived proposal under the Strategic Proposal due to the timing of the release of the Ministerial Statement for the Strategic Proposal.

BHP's Orebody 18 and Orebody 31 operations are north of the proposal in the Jimblebar Creek catchment. The nearest third party iron ore mining operations is Rio Tinto's Hope Downs 4 operations located 55 km to the northwest of the proposal.

In 2014, the EPA released advice under s. 16(e) of the EP Act on the *Cumulative Environmental Impacts of Development in the Pilbara Region*. This advice included a recommendation that a strategic plan for biodiversity conservation in the Pilbara be developed by the State Government. The Government subsequently released the *Pilbara Conservation Strategy* in 2016.

The s. 16(e) advice and the *Pilbara Conservation Strategy* both identified some of the key threats to environmental values in the Pilbara. These include land clearing, altered fire regimes, and introduced flora and fauna species. The EPA's s. 16(e) advice also recommended the establishment of a strategic, coordinated approach to offsets in the Pilbara. The Pilbara Environmental Offsets Fund was announced by the State Government in July 2016 and was established by the Department of Water and Environmental Regulation.

Mining operations at Jimblebar are conducted under the *Iron Ore (McCamey's Monster) Authorisation Agreement Act 1972 (WA)* and *Iron Ore (Mount Newman) Agreement Act 1964 (WA)*.

3. Consultation

The EPA advertised the referral information for the proposal for public comment in September 2019. No submission were received.

The proponent consulted with government agencies and key stakeholders during the preparation of the Environmental Review Document provided with the referral. The agencies and stakeholders consulted, the issues raised and the proponent's response are detailed in Table 8 of the Environmental Review Document (Jimblebar Optimisation Project: Jimblebar Iron Ore Mine Revised Proposal Environmental Review Document – referral supplementary report, August 2019).

The EPA considers that the consultation process has been appropriate and that reasonable steps have been taken to inform the community and stakeholders about the proposed development. Relevant significant environmental issues identified from this process were taken into account by the EPA during its assessment of the proposal.

4. Key environmental factors

In undertaking its assessment of this proposal and preparing this report, the EPA had regard for the object and principles contained in s. 4A of the EP Act to the extent relevant to the particular matters that were considered.

The EPA considered the following information during its assessment:

- the proponent's referral information including the Environmental Review Document provided with the referral
- stakeholder comments received during the preparation of the proponent's documentation
- the EPA's own inquiries
- the EPA's *Statement of environmental principles, factors and objectives* (EPA 2018a)
- the relevant principles, policy and guidance referred to in the assessment of each key environmental factor in sections 4.1 to 4.3.

Having regard to the above information, the EPA identified the following key environmental factors during the course of its assessment of the proposal:

- **Flora and Vegetation** – clearing of 2,000 ha of native vegetation and indirect impacts on vegetation due to changes in hydrology caused by the proposal.
- **Inland Waters** – implementation of a managed aquifer recharge scheme and discharge of surplus water to Caramulla Creek, altering the hydrological regimes of the area.
- **Terrestrial Fauna** – disturbance of fauna habitat, including habitat for conservation significant species, as a result of the clearing required for the proposal, with indirect impacts to fauna species also possible.

The EPA considered other environmental factors during the course of its assessment of the proposal. These factors, which were not identified as key environmental factors, are discussed in the proponent's referral documentation (BHP 2019). Appendix 3 contains an evaluation of why these other environmental factors were not identified as key environmental factors.

Having regard to the EP Act principles, the EPA considered that the following principles were particularly relevant to its assessment of the proposal:

1. **The principle of intergenerational equity** – the EPA notes that decommissioning and rehabilitation of the proposal is required to ensure that the environment is maintained for future generations.
2. **The principle of the conservation of biological diversity and ecological integrity** – the proponent has amended the development envelope to avoid known locations of a Priority 1 flora species. The EPA has recommended conditions to minimise the impacts on Flora and Vegetation and Inland Waters.

Appendix 2 provides a summary of the principles and how the EPA considered these in its assessment.

The EPA's assessment of the proposal's impacts on the key environmental factors is provided in sections 4.1 to 4.3. These sections outline whether or not the EPA considers that the impacts on each factor are manageable. Section 6 provides the EPA's conclusion as to whether or not the proposal as a whole is environmentally acceptable.

4.1 Flora and Vegetation

EPA objective

The EPA's environmental objective for this factor is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained.*

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016a)
- *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016a).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015) and *Cumulative environmental impacts of development in the Pilbara region* (EPA 2014).

EPA assessment

Existing environment and potential impacts

Since 1994, BHP has undertaken 27 flora and vegetation surveys wholly or partially within the proposed development envelope. This comprises 19 detailed surveys, four reconnaissance surveys, three targeted surveys and one desktop assessment. Nine of these surveys have been carried out since April 2014.

The proposal will impact on flora and vegetation through the direct clearing of 2,000 ha of native vegetation and may indirectly impact through changes to water regimes and introduction or spread of weeds.

Flora

Surveys undertaken did not identify species considered as threatened flora within the development envelope. Seven species of flora listed as Priority flora by the Department of Biodiversity, Conservation and Attractions have been recorded:

- *Eremophila capricornica* (Priority 1)
- *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684) (Priority 1)
- *Euphorbia inappendiculata* var. *inappendiculata* (Priority 2)
- *Aristida jerichoensis* var. *subspinulifera* (Priority 3)
- *Rhagodia* sp. Hamersley (M. Trudgen 17794) (Priority 3)
- *Triodia* sp. Mt Ella (M.E. Trudgen 12739) (Priority 3)
- *Goodenia nuda* (Priority 4).

The impacts of the proposal on the known records of these seven species are shown below in Table 3, which has been adapted from the proponent's environmental review document (BHP 2019).

Table 3: Potential impacts to Priority flora species

Species	Known records (and populations) within WA	Records (and populations) within development envelope	Records within development envelope as % of known records	Records within indicative footprint	Records within indicative footprint as % of known records
Eremophila capricornica (Priority 1)	156 (31 populations)	22 (6 populations)	14%	17	11%
Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684) (Priority 1)	32 (30 populations)	1 (1 population)	3.1%	1	3.1%
Euphorbia inappendiculata var. *inappendiculata* (Priority 2)	8 (6 populations)	1 (1 population)	13%	0	0%
Aristida jerichoensis var. *subspinulifera* (Priority 3)	231 (127 populations)	1 (1 population)	0.4%	1	0.4%
Rhagodia sp. Hamersley (M. Trudgen 17794) (Priority 3)	1,486 (214 populations)	121 (4 populations)	8.1%	117	7.9%
Triodia sp. Mt Ella (M.E. Trudgen 12739) (Priority 3)	421 (70 populations)	1 (1 population)	0.2%	0	0%
Goodenia nuda (Priority 4)	555 (243 populations)	18 (7 populations)	3.2%	4	0.7%

Given the percentage of impact to the species from the proposal, the distribution of known records of these species, and the Department of Biodiversity, Conservation and Attractions' Priority ranking, the EPA considers that the species with the greatest potential for significant impacts are *Eremophila capricornica*, *Euphorbia inappendiculata* var. *inappendiculata* and *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684). For the other four Priority species, the EPA considers that the level of direct disturbance, and cumulative impact with other proposals is unlikely to represent a significant regional impact to these four species.

Eremophila capricornica

Eremophila capricornica is a newly described species, with it being formally described in 2016. It was previously known as *Eremophila* sp. Jigalong (B. Buirchell BB 204). This species is restricted to the northeast Gascoyne, east of Newman across to Jigalong with scattered populations over a narrow geographical range. Within the development envelope, there is 14 per cent of the known records of this species, with 11 per cent of the records being within the indicative footprint of the proposal.

When describing the species Buirchell and Brown (2016) discussed the restricted geographical range over which the species is found. The EPA notes that *Eremophila capricornica* has a restricted distribution.

The proponent has amended the development envelope to avoid impact on 23 locations of the *Eremophila capricornica*. This reduced the potential direct impact to the species from up to 29 per cent of known records to up to 14 per cent of known records.

Euphorbia inappendiculata var. inappendiculata

This species is uncommon in Western Australia where it is known from two areas in the Hamersley subregion of the Pilbara, and west of Halls Creek in the Kimberley. Within the development envelope, it is known from a single record. This record is approximately 240 km from the nearest known population in the Hamersley subregion and along with a record nearby to the Jimblebar Project north of Mount Whaleback, represents a range extension to the south-eastern extent of the range of this species.

Of the eight records of this species, the only one that currently has the known potential to be impacted is the population within the development envelope. This population is not currently within the indicative footprint of the revised proposal and would not be directly impacted unless the indicative footprint is amended.

Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)

The habitat of this species is generally connected to plains with red clay loams dominated by Mulga open woodland over tussock grassland predominantly from the Aristida genus (BHP 2019). This species has a scattered distribution east of Karijini National Park and within and around the Coondewanna Flats. Within the proposed development envelope, this species is known from a single record in the southwest of the development envelope. Suitable habitat for this species occurs in areas adjacent to the development envelope.

The EPA notes that in the Environmental Review Document for the Eliwana Railway Project there are 39 known individuals of this species. Given there are 39 known individuals, the actual loss associated with the Jimblebar Optimisation Project would be less than stated in BHP's referral information.

The EPA notes that habitat for this species is found adjacent to the development envelope, and it has scattered distribution across the Pilbara region. The EPA also notes there are currently no known cumulative impacts to other individuals of this species from other proposals. The Eliwana Railway Project was not predicted to directly impact on this species, with recordings outside the indicative footprint of the Eliwana Railway Project.

Vegetation

Detailed vegetation mapping has been carried out across the development envelope as part of the flora and vegetation surveys, with 58 vegetation associations mapped. No Threatened Ecological Communities or Priority Ecological Communities were identified in the development envelope[1].The conservation significant vegetation associations identified are sheetflow dependent (particularly Mulga vegetation) and riparian vegetation associated with creeklines. Within the indicative footprint, 89 per cent of vegetation has been mapped as being in 'Good' to 'Excellent' condition.

Sheetflow dependent Mulga vegetation

Mulga vegetation has a shallow root system that relies on surface water sheetflow and is considered sensitive to changes in sheetflow patterns. Mulga vegetation found within the development envelope may be impacted by surplus water management infrastructure, particularly pipelines. Two vegetation associations considered to comprise sheetflow dependent Mulga may be indirectly impacted by the proposal. The total predicted area of indirect impact to these two vegetation associations is 967.2 ha, which represents a maximum of 43 per cent impact of the known mapped extent on BHP tenure of these associations.

Riparian vegetation

The EPA considers riparian vegetation in the Pilbara to be locally significant as it provides important habitat for fauna species, including conservation significant species. There are no direct impacts predicted to riparian vegetation. The proposed surplus water discharge from the proposal may result in indirect impacts to riparian vegetation due to continuous inundation causing waterlogging and a decline in vegetation health. The change in water availability may also alter the composition of species found within riparian communities. The eventual cessation of discharge into Caramulla Creek, such as at the time of mine closure, may also impact on riparian vegetation as the hydrological regime of the creek is altered and vegetation again adjusts to changed water availability.

[1] The Ethel Gorge Threatened Ecological Community (TEC) is located near the development envelope. Ethel Gorge is a TEC due to the stygofauna found within the groundwater, and is not a TEC based on vegetation communities. Therefore, the EPA considered this TEC under the Subterranean Fauna factor.

BHP has predicted that up to 71 ha of riparian vegetation may be inundated by the proposed discharge into Caramulla Creek, which represents 12 per cent of the mapped riparian vegetation of the creek.

Mitigation and Management

The EPA notes the development envelope for the proposal has been amended to avoid impacts on 23 locations of *Eremophila capricornica*. Further impacts to this species may be avoided as the known records are located within the managed aquifer recharge borefield where there is some flexibility when determining final placement of infrastructure.

Groundwater level rise within the managed aquifer recharge borefield is proposed to be restricted to 25 metres below ground level (mbgl) to avoid inundation of root systems on facultative phreatophytes that have historically relied on water in the soil rather than groundwater to meet their water requirements.

Pipelines will be buried below ground, where possible given geotechnical conditions, to minimise the impacts on areas of sheetflow dependent mulga. Where pipelines cannot be buried, BHP will look to raise sections of the pipeline to allow sheetflow to pass underneath to prevent ponding and shading of surface water flows.

The use of existing infrastructure from the Jimblebar Iron Ore Project helps to minimise the amount of clearing required for the revised proposal. The existing operations at Jimblebar are managed under different environmental management plans related to flora and vegetation, which is a requirement of the current conditions imposed on the existing proposal. The Jimblebar Flora and Vegetation Management Plan has been developed to provide a consolidated approach to managing the whole Jimblebar Iron Ore Project

The health of riparian vegetation species along Caramulla Creek will be monitored to ensure that impacts of the surface water discharge into the creek will not be greater than predicted. BHP has committed to restricting the wetting front of the surface discharge to 34 km downstream of the discharge point. Detailed management measures to achieve this environmental outcome are contained within the Jimblebar Water Management Plan. The management of impacts of surface water discharge and the Jimblebar Water Management Plan are discussed further under the Inland Waters factor.

The EPA notes the measures taken to avoid and minimise the impacts on flora and vegetation. The EPA considers, that to prevent significant indirect impacts on vegetation, groundwater mounding should remain 25 mbgl, and the wetting front should not extend beyond 34 km.

Rehabilitation and decommissioning of the proposal is also required to minimise the impacts on flora and vegetation. BHP proposes to gradually reduce water flows in Caramulla Creek at the time of mine closure to allow riparian vegetation time to adjust to changes in the water availability. The Department of Water and Environmental Regulation has indicated support for this strategy.

The majority of the proposal is located on State Agreement Act tenements, and is not subject to the mine closure requirements of the *Mining Act 1978*. The EPA therefore considers that a mine closure condition should be applied to the proposal through the EP Act.

There are currently different mine closure requirements contained in the different ministerial statements for the Jimblebar Iron Ore Project. The EPA considers it appropriate to have one mine closure plan across the whole proposal so there is a consistent approach to closure. The existing approved mine closure plan for the Jimblebar Iron Ore Project was prepared on this basis and a draft of this plan has been updated to incorporate the Jimblebar Optimisation Project.

Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016a)
- results of surveys undertaken across the development envelope, which did not identify any threatened flora, or threatened or priority ecological communities
- amendment of the development envelope boundary to avoid 23 locations of *Eremophila capricornica*
- construction of infrastructure to minimise disruption to sheetflow
- significant residual impacts associated with clearing up to 2,000 ha of native vegetation in ‘Good’ to ‘Excellent’ condition.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Flora and Vegetation that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through authorised extent in schedule 1 of the Recommended Environmental Conditions (Appendix 4)
- implementation of measures to avoid and minimise direct and indirect impacts on priority flora through the implementation of the Jimblebar Flora and Vegetation Management Plan (condition 5)
- implementation of measures to meet the environmental outcomes associated with surplus water management through the implementation of the Jimblebar Water Management Plan (condition 7)
- decommissioning and rehabilitation undertaken that is safe, stable and non-polluting, and in an ecologically appropriate and sustainable manner (condition 8)
- a contribution of funds to the Pilbara Environmental Offset Fund (see section 5, condition 9) to counterbalance the significant residual impact of additional clearing of vegetation in ‘Good’ to ‘Excellent’ condition.

4.2 Inland Waters

EPA objective

The EPA's environmental objective for this factor is *to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.*

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Inland Waters* (EPA 2018b)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Inland Waters* (EPA 2018b).

EPA assessment

Existing environment and potential impacts

The proposal is located within the Upper Fortescue River Basin, and sits in the Jimblebar Creek and Caramulla Creek surface water catchments. On a regional scale, the groundwater system is made up of Tertiary detritals and the underlying Wittenoom Formation, with the local aquifer being the Dolomite Aquifer. Pre-mining, groundwater levels within the development envelopment were around 50 mbgl.

Key water dependent environmental values in or near the development envelope are the Ethel Gorge Aquifer Stygobiont Community Threatened Ecological Community (Ethel Gorge TEC), Innawally Pool and Jinerabar Pool.

The proposal does not involve any change to the approved volume of groundwater abstraction required for the existing proposal. The Jimblebar Optimisation Project would not result in any new, different or additional impacts on the hydrological regimes of the Ethel Gorge TEC and will not be considered further by the EPA as part of the assessment of the revised proposal.

The proposal involves discharge of surplus water into the main channel of Caramulla Creek. Modelling of the extent of the predicted wetting front associated with different discharge volumes has been undertaken. Modelling of the discharge of 75 megalitres/day predicts that the wetting front will extend up to 34 km downstream of the discharge point. BHP has proposed to restrict the allowable extent of the wetting front to this 34 km and included this in the key characteristics for the proposal. The water to be discharged is of comparable quality to the water quality of Caramulla Creek.

Environmental Factor Guideline – Inland Waters (EPA 2018b) identifies that for the purposes of environmental impact assessment and in relation to ecosystem health,

the EPA is focussed on impacts to significant ecosystems. The list of ecosystems that the EPA considers significant includes springs and pools in arid areas. Innawally Pool and Jinerabar Pool are two pools that could be impacted by the surface water discharge.

Innawally Pool is a semi-permanent pool along Jimblebar Creek within the development envelope. It is likely to be a perched water feature given regional groundwater levels and supports aquatic fauna including turtles and frogs. The EPA notes that no surface water discharge is proposed into Jimblebar Creek and therefore the hydrological regimes of Innawally Pool will not be impacted.

Jinerabar Pool is an intermittent pool located near the confluence of Jimblebar and Caramulla creeks. This pool is filled by surface water flow and there are signs of heavy grazing around the pool. The EPA notes that wetting front of the surface water discharge into Caramulla Creek has been modelled to extend 34 km downstream of the discharge point. Jinerabar Pool is over 40 km downstream of the discharge and therefore the hydrological regimes of Jinerabar Pool are unlikely to be impacted by the proposal.

The EPA considers that the main impacts from the surface water discharge to Caramulla Creek is to the riparian vegetation of the creek system. These impacts have been addressed under the key environmental factor, Flora and Vegetation.

The changes to the proposal also involve the implementation of a managed aquifer recharge scheme which is in the Caramulla area east of the existing Jimblebar Project (Figure 3). BHP has undertaken modelling to predict the increases in groundwater levels as a result of the aquifer recharge. The largest predicted changes to the existing groundwater levels are predicted to remain within the development envelope, with smaller increases in groundwater levels extending to the east of development envelope due to local hydrogeological conditions. Figure 11 of the proponent's Environmental Review Document shows the predicted changes in groundwater levels due to groundwater mounding (BHP 2019).

Geological drilling by BHP identified a clay unit that creates uncertainty in the modelling for the managed aquifer recharge scheme. In particular, whether the clay unit creates a barrier that will reduce the capacity of the managed aquifer recharge scheme that will result in groundwater mounding and rises in groundwater levels larger than predicted when smaller volumes of water have been injected.

The quality of water being abstracted from Jimblebar and proposed to be injected through the managed aquifer recharge scheme is comparable to that in the received aquifer. The total dissolved solids at Jimblebar ranges from 300 to 1,000 milligrams per litre (mg/L), whereas at Caramulla it ranges from 500 to 900 mg/L. The EPA considers that the reinjection of water at Caramulla is unlikely to significantly change the quality of water in the aquifer.

Mitigation and Management

Key measures to avoid and minimise the impacts from the changes in surface water management from the Jimblebar proposal are:

- restricting groundwater rise from the managed aquifer recharge scheme to 25 mbgl
- discharge of surplus water into the main channel of Caramulla Creek to minimise changes to the creek flow path, with discharge infrastructure located to reduce erosion and scouring of the creek
- wetting front managed so that it does not reach Jinerabar Pool.

Ophthalmia Dam is currently used to manage surplus water from the existing Jimblebar operations, along with water from other BHP operations in the area. The addition of managed aquifer recharge and discharge into Caramulla Creek provides BHP with options to manage surplus water to minimises environmental impacts. The EPA considers this approach to be consistent with surplus water use hierarchy outlined in the then Department of Water's *Western Australian water in mining guidelines*.

BHP has prepared the Jimblebar Water Management Plan. This plan contains management measures to ensure the predicted water levels rise of 25 mbgl and wetting front extent of 34 km are met.

The EPA notes the uncertainty with regards to the clay unit and its impacts on the managed aquifer recharge scheme. The EPA considers that the management of the proposal to restrict groundwater rise to 25 mbgl is appropriate to prevent groundwater level rises beyond this amount and address the uncertainty in the implementation of the managed aquifer recharge scheme.

The Department of Water and Environmental Regulation has advised that whilst there is some uncertainty associated with the modelling, BHP has appropriate controls and triggers in place to allow adaptive management.

Management measures proposed as part of mine closure include designing and constructing drainage realignments to be comparable with original drainage systems, and manage potential acid forming materials within overburden storage areas. These measures are contained within the redrafted *Jimblebar Mine Closure Plan.*

The EPA notes that the proposed changes to surplus water management for the proposal also requires approval under the *Rights in Water and Irrigation Act 1914* and Part V of the EP Act.

Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Inland Waters* (EPA 2018b)
- surface water discharge not impacting on Innawally Pool or Jinerabar Pool
- surface water management options to minimise environmental impacts and are also in accordance with the Department of Water's *Western Australian water in mining guideline*
- proposed management to ensure the following environmental objectives are met:

- groundwater mounding from the managed aquifer recharge scheme remains at least 25 mbgl
- the wetting front from surface water discharge into Caramulla Creek does not extend more than 34 km downstream of the discharge point.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Inland Waters that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through authorised extent in schedule 1 of the Recommended Environmental Conditions (Appendix 4)
- implementation of measures to meet the environmental objectives associated with surplus water management through the implementation of the Jimblebar Water Management Plan (condition 7).

The EPA notes that there is a requirement for:

- licensing of water abstraction by the Department of Water and Environmental Regulation under the *Rights in Water and Irrigation Act 1914*
- licensing of emissions and discharges by the Department of Water and Environmental Regulation under Part V of the EP Act.

4.3 Terrestrial Fauna

EPA objective

The EPA's environmental objective for this factor is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained*.

Relevant policy and guidance

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016c)
- *Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna* (EPA 2010)
- *Technical Guidance – Terrestrial Fauna Surveys (*EPA 2004*)*
- *Technical Guidance – Sampling of Short Range Endemic Invertebrate Fauna (*EPA 2009*)*
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

The considerations for environmental impact assessment for this factor are outlined in *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016c).

In addition to the relevant current policy and guidance above, the EPA also had regard to the *Guidelines for Preparing Mine Closure Plans* (DMP and EPA 2015) and *Cumulative environmental impacts of development in the Pilbara region* (EPA 2014).

EPA assessment

Existing Environment and Potential Impacts

BHP has carried out 18 vertebrate fauna surveys and five short range endemic invertebrate fauna surveys within the development envelope, with four of these surveys carried out within the last five years.

These surveys have been used to carry out detailed fauna habitat mapping across the development envelope. Nine major habitat types have been mapped and these are detailed in the proponent's Environmental Review Document. The proposal requires the clearing of an additional 2,000 ha of native vegetation, which would disturb eight of the nine habitat types.

The EPA recognises the high value of riparian vegetation in the Pilbara as fauna habitat. The proposal would impact on up to 71 ha of riparian vegetation that provides this important habitat for fauna species. The EPA has assessed this impact under the key environmental factor, Flora and Vegetation.

A recent targeted survey focussed on determining the presence of the ghost bat (*Macroderma gigas*) and the greater bilby (*Macrotis lagotis*) due to historical records of these conservation significant species in or near the development envelope.

There is a historical recording of the greater bilby east of the development envelope, with the presence of a burrow recorded. The targeted surveys did not record any new or recent evidence of this species. A sand goanna was recorded on camera near the historical burrow, with signs the goanna was utilising the burrow. The EPA considers that the greater bilby is unlikely to be found within the development envelope and further assessment of the impacts on this species is not required.

Ghost bat

The ghost bat is listed as Threatened Fauna (Vulnerable) under the *Biodiversity Conservation Act 2016*. The presence of the ghost bat in the development envelope was reported during a survey in 2006, with subsequent investigations determining that this may have been a false recording of the species. Two potential roost sites were located within the development envelope, with surveys, including acoustic recordings, failing to record evidence of ghost bat use of the two roost sites.

Recent survey results have determined that there are a number of caves to the north and south of the development envelope, with some evidence of use of these caves by ghost bats as day roosts. It is therefore considered likely that foraging habitat for ghost bats occurs within the development envelope.

The loss of foraging habitat, along with the destruction of caves, is seen as a key threat for the ghost bat by the Conservation Advice for ghost bats developed under the *Environment Protection and Biodiversity Conservation Act 1999*.

There is reported evidence that ghost bats are considered to forage up to two kilometres from roost caves. Figure 20 of the proponent's Environmental Review Document shows where foraging habitat based on this two-kilometre range is within the development envelope. This includes areas that have already been disturbed for the existing Jimblebar Iron Ore Project.

The EPA considers ghost bats are unlikely to be significantly impacted by the proposal. This is because no significant roosts have been identified within the areas of impact, and large areas of suitable foraging habitat are available outside of the development envelope.

The EPA also considers that given there are no significant roosts or roosting habitat within the development envelope, and there are large areas of foraging habitat available outside the development envelope that, the local loss of foraging habitat within the development is not necessary to maintain the species and does not constitute an additional significant residual impact at a local scale.

Other conservation significant vertebrate fauna

Besides the ghost bat, no other threatened fauna species have been recorded in the development envelope.

Priority fauna species recorded in the development envelope are:

- western pebble-mound mouse (*Pseudomys chapmani*) – Priority 4
- brush-tailed mulgara (*Dasycercus blythi*) – Priority 4
- spotted ctenotus (*Ctenotus uber johnstonei*) – Priority 2

All three species are known to occur across the Pilbara. Locally, the habitat from which these species have been recorded extends outside the indicative footprint and outside the development envelope. The EPA considers that the impacts on Priority fauna species from the proposal are unlikely to be significant.

Short range endemic invertebrate fauna

Short range endemic (SRE) fauna species are considered vulnerable to impacts due to their poor dispersal ability outside their preferred habitat (EPA 2009). One confirmed (*Karaops* ARA004-DNA) and six potential SRE species have been recorded within the development envelope for the proposal. All seven species are known from the same fauna habitat type, being rocky microhabitats of the Hillslope/Hillcrest habitat type.

For this habitat type, 4,274 ha has been mapped in the development envelope, with 15.4 per cent (660 ha) of this habitat predicted to be disturbed by the proposal. The Hillslope/Hillcrest habitat type is also found in adjacent areas outside the development envelope, and the EPA notes there are recordings of the seven SRE species in these adjacent areas.

Mitigation and Management

The development envelope was amended to avoid the overhang where evidence of ghost bats was recently recorded, reducing the impact to one record of this species.

The proposal will also utilise existing infrastructure, where practicable, to reduce the total disturbance required for the proposal.

BHP has not proposed any specific management measures for Terrestrial Fauna for the construction and operation of the proposal, on the basis that the proposal does not impact on any significant fauna habitat types or features. The EPA considers that specific management measures are not required given the measures taken to avoid impacts and minimise impacts on the key environmental factor Flora and Vegetation, particularly riparian vegetation.

The proposal will require rehabilitation and decommissioning to reduce the impacts on Terrestrial Fauna. Measures to rehabilitate areas to fauna habitat included in the Mine Closure Plan are:

- integrate specific fauna habitats (e.g. large rocks, logs and smaller woody debris) into landform design to provide habitat for fauna species
- design the revegetation program to blend in with the surroundings areas to provide habitat and foraging area for native fauna.

The majority of the proposal is located on State Agreement Act tenements, and is not subject to the mine closure requirements of the *Mining Act 1978*. The EPA therefore considers that a mine closure condition should be applied to the proposal through the EP Act.

Summary

The EPA has paid particular attention to the:

- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016c)
- lack of significant ghost bat roosts in the development envelope, and the large areas of foraging habitat available outside the development envelope
- habitat for short range endemic species extending outside the development envelope
- proposed rehabilitation measures to restore terrestrial fauna habitat.

The EPA considers, having regard to the relevant EP Act principles and environmental objective for Terrestrial Fauna that the impacts to this factor are manageable and would no longer be significant, provided there is:

- control through authorised extent in schedule 1 of the Recommended Environmental Conditions (Appendix 4)
- decommissioning and rehabilitation undertaken that is safe, stable and non-polluting, and in an ecologically appropriate and sustainable manner (condition 8)
- a contribution of funds to the Pilbara Environmental Offset Fund (see section 5, condition 9) to counterbalance the significant residual impact of additional clearing of vegetation in ‘Good’ to ‘Excellent’ condition that contains habitat for the ghost bat.

5. Offsets

Relevant policy and guidance

The EPA considers the following policy and guidance is relevant to its assessment of offsets for the proposal:

- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offset Guidelines* (Government of Western Australia 2014)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual 2018* (EPA 2018).

The EPA has also considered its strategic advice on *Cumulative environmental impacts of development in the Pilbara Region – Advice of the Environmental Protection Authority to the Minister for Environment under Section 16 (e) of the Environmental Protection Act 1986* (EPA 2014), for the assessment of offsets.

EPA assessment

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual impacts of a proposal. The EPA may apply environmental offsets where it determines that the residual impacts of a proposal are significant, after avoidance, minimisation and rehabilitation have been pursued.

Mitigation measures are assessed under the relevant environmental factor (see sections 4.1 to 4.3). In applying the residual impact significance model (Government of Western Australia 2014), the EPA considers that the proposal would have a significant residual impact from the following:

- clearing of native vegetation in ‘Good’ to ‘Excellent’ condition, that contains foraging habitat for the ghost bat.

In its advice on the cumulative impacts in the Pilbara (EPA 2014), the EPA considered that without intervention, the increasing cumulative impacts of development and land use in the Pilbara region will significantly impact on biodiversity and environmental values.

The EPA considers that the clearing of native vegetation and impacts on other associated environmental values in the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion is significant where the cumulative impact may reach critical levels if not managed.

The proposal is located within the Fortescue and Hamersley IBRA subregions. Only 0.55 per cent of the Fortescue subregion and 13 per cent of the Hamersley subregion are currently reserved for conservation.

Consistent with the Residual Impact Significance Model in the *WA Environmental Offsets Guidelines*, where the cumulative impact may reach critical levels if not managed, the clearing of up to 2,000 ha of native vegetation in ‘Good’ to ‘Excellent’ condition within the Fortescue and Hamersley IBRA subregions, that contains

foraging habitat for the ghost bat and no significant roosts, requires an offset to counterbalance the significant residual impact of the clearing.

Conservation areas in the Pilbara bioregion total approximately eight per cent of the area, with the remainder mostly Crown Land overlain with mining tenements and pastoral leases. The EPA recognises that the opportunity for proponents to undertake individual offsets in the Pilbara Region is constrained by overlapping land tenure arrangements and limited land access to undertake on-ground offset actions. As such, traditional approaches to offsets, namely land acquisition and management offsets, are therefore limited.

In its advice on cumulative impacts in the Pilbara (EPA 2014), the EPA proposed the establishment of a strategic conservation initiative for the Pilbara as a mechanism to pool offset funds to achieve biodiversity conservation outcomes. Such an approach would provide a mechanism to overcome some of the offset implementation constraints. A pooled offset approach is consistent with the *WA Environmental Offsets Policy,* which states that environmental offsets will be focused on longer term strategic outcomes (Principle 6). Strategic approaches, such as the use of a fund, can provide a coordinating mechanism to implement offsets across a range of land tenures (Government of Western Australia 2014).

A contribution to a strategic conservation initiative focused on these or similar types of actions would allow for an outcome that counterbalances the significant residual impacts from this proposal. The EPA considers that there should be a clear target outcome for each offset project supported by the offset funds. A clear link must be drawn between the outcomes and the significant residual impacts of the individual proposal. Funds should be used for landscape scale on-ground actions in the Pilbara IBRA region and indirect actions (such as research) that will directly counterbalance the significant residual impacts and contribute to biodiversity conservation outcomes in the region.

The EPA has stated that the type of environmental offsets in the Pilbara that contribute to a strategic conservation initiative will ensure a consistent and transparent approach and contribute to longer term strategic outcomes, with contributions based on an assessment of the significance of environmental impacts.

The EPA's view is that project funding for offsets should not be used to provide substitute funding for existing government programs or proponent obligations.

Commensurate with other decisions within the Fortescue and Hamersley IBRA subregions, the EPA recommends that the following offset rates should apply in the form of a contribution to a Pilbara strategic conservation initiative for landscape-scale actions to protect biodiversity in the Pilbara:

- $816 per hectare for clearing of 'Good' to 'Excellent' condition vegetation in the Hamersley IBRA subregion
- $1,632 per hectare for clearing of 'Good' to 'Excellent' condition vegetation in the Fortescue IBRA subregion.

Summary

The EPA recommends that an offset condition (condition 9) is imposed to counterbalance the significant residual impacts of the proposal. The EPA recommends that offset contribution rate of $816 per hectare in the Hamersley subregion, and $1632 per hectare in the Fortescue subregion be applied for the clearing of 2000 ha of ‘Good’ to ‘Excellent’ condition native vegetation, that contains foraging habitat for the ghost bat.

As stated in the Procedures Manual, if a proposal relates to a change to, or an expansion of an approved proposal, current offsets practice applies to these changes. Consistent with this, the EPA is only assessing whether offsets are appropriate for the additional impacts arising from this proposal. The clearing of native vegetation and changes to the hydrological regimes in the Ethel Gorge TEC approved under Ministerial Statements 683, 809 and 857 are exempt from offsets requirements, except for the offsets required under Ministerial Statement 1029 which amends Ministerial Statement 857, as offsets were not applied at the time the implementation agreement or decision was made.

6. Conclusion

Application of mitigation hierarchy

The EPA has considered BHP's proposal to expand the Jimblebar Iron Ore Project.

Consistent with relevant policies and guidance, the proponent has addressed the mitigation hierarchy by identifying measures to avoid, minimise and rehabilitate environmental impacts including:

- amending of the development envelope to avoid 23 locations of the Priority 1 flora species *Eremophila capricornica*
- surface water discharge not impacting on Innawally Pool or Jinerabar Pool
- design of infrastructure to minimise impacts on sheet flow
- ensuring that the wetting front from surface water discharge into Caramulla Creek does not extend more than 34 km downstream of the discharge point
- ensuring groundwater mounding from the managed aquifer recharge scheme remains at least 25 mbgl
- decommissioning and rehabilitation in accordance with the Jimblebar Mine Closure Plan.

Offsets

The EPA considers there would be a significant residual impact from the clearing of 2,000 ha of 'Good' to 'Excellent' condition native vegetation that contains foraging habitat for the ghost bat. The EPA has recommended a condition (condition 9) to offset this significant residual impact through contribution to the Pilbara Environmental Offsets Fund in accordance with the WA Offsets policy

Conclusion

The EPA has taken the following into account in its assessment of the proposal as a whole, including the:

- impacts to all the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- relevant EP Act principles and the EPA's objectives for the key environmental factors
- EPA's view that the impacts to the key environmental factors are manageable, provided the recommended conditions are imposed.

Given the above, the EPA has concluded that the proposal may be implemented subject to the conditions recommended in Appendix 4.

The EPA notes that the proposal is a revised proposal and the recommended conditions would supersede the existing conditions contained within the ministerial statements that currently apply to the Jimblebar Iron Ore Project.

7. Recommendations

That the Minister for Environment notes:

1. That the proposal assessed is to provide additional areas for mining infrastructure (including overburden storage) and new surplus water management options for the Jimblebar Iron Ore Project.
2. The key environmental factors identified by the EPA in the course of its assessment are Flora and Vegetation, Inland Waters, and Terrestrial Fauna, set out in section 4.
3. The EPA has concluded that the proposal may be implemented, provided the implementation of the proposal is carried out in accordance with the recommended conditions and procedures set out in Appendix 4. Matters addresses in the conditions include the following:
    a) an environmental management plan to minimise impacts to Flora and Vegetation (condition 5)
    b) an environmental management plan to meet environmental objectives related to the management of surplus water (condition 7)
    c) mine closure plan to address decommissioning and rehabilitation of mine (condition 8)
    d) an offset to counterbalance impact to vegetation in ‘Good’ to ‘Excellent’ condition, including foraging habitat for the ghost bat (condition 10).
4. The recommended conditions and procedures set out in Appendix 4 would apply to the whole of the Jimblebar Iron Ore Project and supersede the conditions in Ministerial Statements 683, 809, 857 and 1029.

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EPA 2018a, *Statement of Environmental Principles, Factors and Objectives*, Environmental Protection Authority, Perth, WA.

EPA 2018b, *Environmental Factor Guideline – Inland Waters*, Environmental Protection Authority, Perth, WA.

EPA 2018c, *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual,* Environmental Protection Authority, Perth, WA.

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Government of Western Australia 2014, *WA Environmental Offsets Guidelines*, Government of Western Australia, Perth

Appendix 1: Consideration of principles

EP Act Principle	Consideration
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by –* *a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *b) an assessment of the risk-weighted consequences of various options.*	In considering this principle, the EPA notes that Flora and Vegetation, Inland Waters and Terrestrial Fauna could be significantly impacted by the proposal. The assessment of these impacts is provided in this report. Investigations into the biological and physical environmental that have been undertaken by the proponent have provided sufficient certainty to assess risks and identify measures to avoid or minimise impacts. The EPA has recommended conditions to ensure relevant management measures are undertaken by the proponent. From its assessment of this proposal the EPA has concluded that there is no threat of serious or irreversible harm.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	This principle is a fundamental and relevant consideration for the EPA when assessing and considering the impacts of the proposal on the environmental factors of Flora and Vegetation, Inland Waters and Terrestrial Fauna. The EPA notes that the proponent has identified measures to avoid or minimise impacts. The EPA has considered these measures during its assessment. The EPA notes that decommissioning and rehabilitation of the proposal is required to ensure that the health, diversity and productivity of the environment is maintained for future generations. From its assessment of this proposal the EPA has concluded that that the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained for the benefit of future generations.

EP Act Principle	Consideration
3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	This principle is a fundamental and relevant consideration for the EPA when assessing and considering the impacts of the proposal on the environmental factors of Flora and Vegetation, Inland Waters and Terrestrial Fauna The EPA notes that the proponent has identified measures to avoid or minimise impacts. The EPA has considered these measures during its assessment. The EPA notes that the impacts may affect biological diversity and ecological integrity due to the impacts to from clearing of native vegetation, including Priority flora species and ghost bat habitat, and alteration of hydrological regimes. The EPA has also considered to what extent the potential impacts from the proposal can be ameliorated by recommended conditions, including offsets. The EPA has concluded that given the nature of the impacts that the proposed offsets are likely to ameliorate the impacts of the loss of biological diversity and ecological integrity given large areas of ghost bat foraging habitat are found outside the development envelope, and no significant roosts have been recorded within the development envelope. The recommended conditions require the implementation of the proposal to be carried out in a manner that avoids and minimises impacts to Priority flora. The EPA notes that the proposal the development envelope was amended to avoid locations of the Priority 1 flora species *Eremophila capricornica*. The EPA has also recommended conditions that contain environmental outcomes that minimise the impacts on hydrological regimes from surplus water management.

EP Act Principle	Consideration
	From its assessment of this proposal the EPA has concluded that the proposal would not compromise the biological diversity and ecological integrity of the affected areas.
4. Principles relating to improved valuation, pricing and incentive mechanisms *(1) Environmental factors should be included in the valuation of assets and services.* *(2) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* *(3) The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* *(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimize costs to develop their own solution and responses to environmental problems.*	In considering this principle, the EPA notes that the proponent would bear the cost relating to storage, treatment and disposal of waste; and the rehabilitation of the proposal. The EPA has had regard to this principle during the assessment of the proposal.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	In considering this principle, the EPA notes that the proponent proposes to utilise standard waste management measures, including a Life of Mine waste strategy. The EPA has had regard to this principle during the assessment of the proposal.

Appendix 2: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency comments	Evaluation of why the factor is not a key environmental factor
LAND			
Subterranean fauna	There is no additional mine pits or changes to volume of groundwater abstraction associated with the change to the proposal. The potential impacts on subterranean fauna are principally from the operation of the Managed Aquifer Recharge (MAR) scheme. Due to the depth of groundwater in the proposed MAR area, it is considered unlikely that the aquifer would host a significant stygofauna community. Based on sampling undertaken throughout the wider Jimblebar area, stygofauna are rarely present (less than 3% of samples) at groundwater depths greater than 40 mbgl. The Ethel Gorge Threatened Ecological Community will not be subject to additional or increased impacts as a result of the change to the approved Jimblebar Proposal. Prospective habitat for troglofauna is the Tertiary detritals. BHP contend that it is generally considered that subterranean species in detritals tend to be	The Department of Water and Environmental Regulation provide comment that clarification was required on the impact of groundwater mounding on the extent of troglofauna habitat that would remain within Tertiary detritals	Subterranean Fauna was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • connectivity of habitat for subterranean fauna in the revised development envelope • limited scale of impacts on subterranean fauna due to the change in the proposal • restrictions on groundwater mounding in the recommended conditions related to Inland Waters factor • *Environmental Factor Guideline – Subterranean Fauna* • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives*, the EPA considers it is unlikely that the proposal would have a significant impact on Subterranean Fauna and that the impacts to this factor are manageable.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency comments	Evaluation of why the factor is not a key environmental factor
	widespread owing to more extensive habitat connectivity. Geological information in the Caramulla MAR area suggests that the Tertiary detritals in the Caramulla area are continuous and widespread. <u>Mitigation</u> Limit groundwater mounding to 25 metres below ground water level. This control is also proposed to limit impacts to groundwater dependent vegetation and controlled through the authorised extent of the revised proposal. The existing proposal is also subject to management requirements to prevent impacts to subterranean fauna (principally the Ethel Gorge TEC) through condition 8 of Statement 857.		Accordingly, the **EPA did not consider Subterranean Fauna to be a key environmental factor** at the conclusion of its assessment.
AIR			
Air quality	<u>Background and impacts</u> *Greenhouse gas emissions* The change to the existing proposal will result in no net annual increase in Scope 1 greenhouse gas emissions from the Scope 1, being 0.414 Mt CO2-e per annum. BHP has reduced the emissions intensity of greenhouse gas emissions from its	No comments on this factor	Air Quality was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • no increase in the net Scope 1 greenhouse gas emissions associated with the change to the proposal

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency comments	Evaluation of why the factor is not a key environmental factor
	iron ore operations from 9.65 tCO_2-e/kt to 8.17 tCO_2-e/kt between 2013 and 2016. *Dust* Dust levels are naturally high within the Pilbara region and windblown dust is expected to be a significant contributor to the ambient dust levels in the area. Dust emissions from the operations of the existing Jimblebar Mine have been assessed under Part V of the EP Act, as part of the Wheelarra Hill (Jimblebar) Iron Ore Mine Operating Licence L5415/1988/9. The licence assessment of dust emissions indicated that the distance to the nearest sensitive receptor (19 km) and the current controls are appropriate to manage the dust emissions from the proposal. <u>Mitigation</u> • Mitigation of greenhouse gas emissions will be undertaken during implementation of the Revised Proposal, through design, technology and operations to minimise greenhouse gas emissions. • Management in accordance with the requirements of the Part V Licence.		• BHP having reduced its greenhouse gas emissions intensity from its iron ore operations • the high ambient dust levels in the region • the licensing requirements under Part V of the EP Act • *Environmental Factor Guideline – Air Quality* • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives*, the EPA considers it is unlikely that the proposal would have a significant impact on Air Quality and that the impacts to this factor are manageable. Accordingly, the **EPA did not consider Air Quality to be a key environmental factor** at the conclusion of its assessment.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency comments	Evaluation of why the factor is not a key environmental factor
PEOPLE			
Social Surroundings (heritage)	The Jimblebar Optimisation Project is located within the Nyiyaparli native title determination area. BHP has an Indigenous Land Use Agreement (ILUA) in place with the Nyiyaparli people. Most of the proposed Development Envelope and all of the Indicative Footprint have been ethnographically and archaeologically surveyed, with the most recent surveys conducted in 2018 to cover the south Jimblebar area. BHP has identified a number of sites within the development envelope and within a 200 metre buffer zone surrounding the development envelope, which could be impacted via secondary impacts. There is also a known heritage site (Nunga Soak) which is located along the Caramulla Creek around 15 km north of the proposed development envelope. An ethno-botanical survey was undertaken in regards to bush tucker and bush medicine in the Jimblebar area. All species identified during the survey are common in the Pilbara and regionally widespread.	No comments on this factor	Social Surroundings was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • identification of heritage sites during surveys with the Nyiyaparli people • management protocols and consultation processes being agreed through the ILUA and associated stakeholder consultation processes • important bush tucker and bush medicine species being common and regionally widespread • *Environmental Factor Guideline – Social Surroundings* • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives*, the EPA considers it is unlikely that the proposal would have a significant impact on Social Surroundings and that the impacts to this factor are manageable. Accordingly, the **EPA did not consider** Social Surroundings **to be a key environmental factor** at the conclusion of its assessment.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency comments	Evaluation of why the factor is not a key environmental factor
	Mitigation • Management of sites in accordance with the ILUA with the Nyiyaparli people. • BHP's current Cultural Heritage Management Plan, which covers the Existing Project, includes the following strategies to manage heritage sites: o actively avoiding areas through infrastructure design; or o consultation with Traditional Owner representatives and submission of an application for consent (under Section 18 of the Aboriginal Heritage Act 1972) to disturb sites. • The ILUA also provides for consultation with the Nyiyaparli people during mine closure planning to consider post-closure land use.		

Appendix 3: Proposed changes to conditions for revised proposal

Proposed Implementation Agreement (Ministerial Statement)

The EPA recommends that the proposal may be implemented and further recommends that the implementation of the proposal be subject to the Implementation Agreement (Ministerial Statement) set out in Appendix 4.

The recommended Ministerial Statement has been developed in accordance with the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual 2018* (EPA 2018c) and includes a review of the following implementation conditions:

- Ministerial Statement 683: Wheelarra Hill Iron Ore Mine Extension Life-of-Mine Proposal, issued on 16 August 2005
- Ministerial Statement 809: Wheelarra Hill Mine Modification, issued on 7 October 2009.
- Ministerial Statement 857: Jimblebar Iron Ore Project, issued on 18 February 2011 (as amended by Ministerial Statement 1029).

Proposed changes

The main changes between the proposed new Ministerial Statement (Appendix 4) and the existing Ministerial Statements relate to:

- removal of redundant conditions
- updating conditions to refer to approved environment management plans and objectives
- updating conditions to reflect the EPA's contemporary condition setting approach
- consolidation of conditions related to mine closure into a single condition

Recommended environmental conditions

The EPA notes the following:

- the Ministerial Statement for the Pilbara Expansion Strategic Proposal (Ministerial Statement No. 1105) provides a framework for conditions to apply to BHP proposals in the Pilbara region. The main changes between the new and existing Ministerial Statements discussed above has been carried out under this framework.
- the Eastern Pilbara Water Resource Management Plan adopts a coordinated approach to the management of water across a number of BHP's operations including the Jimblebar Iron Ore Project.
- management of weeds is addressed under the Jimblebar Flora and Vegetation Management Plan

Recommended proposal details (Schedule 1)

The revised proposal details contained in Schedule 1 (Appendix 4) have been amended to include an updated description which reflects the EPA's contemporary approach to project descriptions described in the EPA's Procedures Manual.

Changes include the following:

- remove key proposal characteristics that are not considered relevant to the environmental impacts, such as ore processing rates or total employee numbers
- clearing values updated to reflect the cumulative area in the revised proposal
- surplus water management included in the authorised extent.

Appendix 4: Identified Decision-Making Authorities and Recommended Environmental Conditions

Identified Decision-making Authorities

Section 44(2) of EP Act specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This Appendix contains the EPA's recommended conditions and procedures.

Section 45(1) requires the Minister for Environment to consult with decision-making authorities (DMAs), and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following decision-making authorities have been identified:

Decision-making Authority	Legislation (and Approval)
1. Minister for Water	*Rights in Water and Irrigation Act 1914* (Water abstraction licence)
2. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972* (Section 18 clearances)
3. Minister for State Development	*Iron Ore (McCamey's Monster) Agreement Authorisation Act 1972* *Iron Ore (Mount Newman) Agreement Act 1964*
4. CEO, Department of Water and Environment Regulation	*Environmental Protection Act 1986* (Works Approval and Licence)
5. Department of Mines, Industry Regulation and Safety	
Executive Director, Environment Resources and Environmental Compliance Division	*Mining Act 1978* (Mining proposal)
Mining Registrar	*Mining Act 1978* (Miscellaneous licences)
State Mining Engineer	*Mines Safety and Inspection Act 1994* (Mine safety)

Note: In this instance, agreement is only required with DMAs 1-3, since these DMAs are a Ministers.

RECOMMENDED ENVIRONMENTAL CONDITIONS

STATEMENT THAT A REVISED PROPOSAL MAY BE IMPLEMENTED (*Environmental Protection Act 1986*)

JIMBLEBAR OPTIMISATION PROJECT

Proposal: Proposal to mine orebodies and undertake associated activities at Jimblebar, located approximately 40 kilometres east of Newman.

The Revised Proposal is a proposal to amend the Jimblebar Iron Ore Project the subject of Statement No. 683 dated 16 August 2005, Statement No. 809 dated 7 October 2009 and Statement No. 857 dated 18 February 2011 (as amended by Statement No. 1029)

Proponent: BHP Billiton Iron Ore Pty Ltd
Australian Company Number 008 700 981

Proponent Address: 125 St Georges Tce PERTH WA 6000

Assessment Number: 2223

Report of the Environmental Protection Authority: 1663

Previous Assessment Numbers: 1558, 1796, 1847 and 2071

Previous Reports of the Environmental Protection Authority: 1168, 1335, 1371 and 1564

Previous Statement Number: 683, 809, 857 and 1029

Pursuant to section 45, read with section 45B of the *Environmental Protection Act 1986,* it has been agreed that:

1. the proposal described and documented in Table 2 of Schedule 1 may be implemented;

2. this Statement supersedes Statement Nos. 683, 809, 857 and 1029, and from the date of this Statement each of the implementation conditions in Statement Nos. 683, 809, 857 and 1029 no longer apply in relation to the Revised Proposal; and

3. the implementation of the Revised Proposal, being the Jimblebar Iron Ore Project as amended by this Proposal, is subject to the following revised implementation conditions:

1 Proposal Implementation

1-1 When implementing the Revised Proposal, the proponent shall not exceed the authorised extent of the Revised Proposal as defined in Table 2 of Schedule 1, unless amendments to the Revised Proposal and the authorised extent of the Revised Proposal have been approved under the EP Act.

2 Contact Details

2-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

3 Compliance Reporting

3-1 The proponent shall prepare and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 3-6 whichever is sooner.

3-2 The Compliance Assessment Plan shall indicate:

(1) the frequency of compliance reporting;

(2) the approach and timing of compliance assessments;

(3) the retention of compliance assessments;

(4) the method of reporting of potential non-compliances and corrective actions taken;

(5) the table of contents of Compliance Assessment Reports; and

(6) public availability of Compliance Assessment Reports.

3-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 3-2, the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 3-1.

3-4 The proponent shall retain reports of all compliance assessments described in the Compliance Assessment Plan required by condition 3-1 and shall make those reports available when requested by the CEO.

3-5 The proponent shall advise the CEO of any potential non-compliance within seven (7) days of that non-compliance being known.

3-6 The proponent shall submit to the CEO the first Compliance Assessment Report annually by 1 October each year addressing compliance in the previous financial

year, or as otherwise agreed in writing by the CEO. The first Compliance Assessment Report shall be submitted by 1 October 2020 addressing the compliance for the period from the date of this Statement, notwithstanding that the first reporting period may be less than twelve (12) months.

The Compliance Assessment Report shall:

(1) be endorsed by the proponent's Chief Executive Officer or a person delegated to sign on the CEO's behalf;

(2) include a statement as to whether the proponent has complied with the conditions;

(3) identify all potential non-compliances and describe corrective and preventative actions taken;

(4) be made publicly available in accordance with the approved Compliance Assessment Plan; and

(5) indicate any proposed changes to the Compliance Assessment Plan required by condition 3-1.

4 Public Availability of Data

4-1 Subject to condition 4-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

4-2 If any data referred to in condition 4-1 contains particulars of:

(1) a secret formula or process; or

(2) confidential commercially sensitive information,

the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the proponent shall provide the CEO with an explanation and reasons why the data should not be made publicly available.

5 Flora and Vegetation Environmental Management Plan

5-1 The proponent shall manage the implementation of the Revised Proposal to meet the following environmental objective:

(1) protect flora and vegetation so that biological diversity and ecological integrity are maintained, and in particular:

(a) avoid and minimise direct and indirect impacts on flora taxa listed as priority flora.

5-2 In order to meet the requirements of condition 5-1, the proponent shall implement the *Jimblebar Flora and Vegetation Management Plan* (Revision 0, November 2019).

5-3 In the event that monitoring, tests, surveys or investigations indicate non-achievement of management target(s) specified in the *Jimblebar Flora and Vegetation Management Plan*, the proponent must:

(1) report the non-achievement in writing to the CEO within twenty-one (21) days of the non-achievement being identified;

(2) investigate to determine the cause of the management target(s) not being achieved;

(3) provide a report to the CEO within ninety (90) days of the non-achievement being reported as required by condition 5-3(1). The report shall include:

(a) the cause(s) of the management targets not being achieved;

(b) the findings of the investigation required by condition 5-3(2);

(c) details of revised and/or additional management actions to be implemented to prevent non-achievement of the management target(s); and

(d) relevant changes to proposal activities.

5-4 If monitoring, tests, surveys or investigations indicate that one or more management actions specified in the *Jimblebar Flora and Vegetation Management Plan* has not been implemented, the proponent shall:

(1) report the failure to implement the management action(s) in writing to the CEO within seven (7) days of identification;

(2) investigate to determine the cause of the management action(s) not being implemented;

(3) investigate to determine the potential environmental harm or alteration of the environment that occurred due to the failure to implement the management action(s);

(4) provide a report to the CEO within twenty-one (21) days of the reporting required by condition 5-4(1). The report shall include:

(a) the cause of the failure to implement the management actions;

(b) the findings of the investigations required by conditions 5-4(2) and 5-4(3);

(c) relevant changes to proposal activities; and

(d) measures to prevent, control or abate the environmental harm which may have occurred.

5-5 Failure to implement one or more of the management actions specified in the *Jimblebar Flora and Vegetation Management Plan* represents non-compliance with these conditions.

5-6 The proponent:

(1) may review and revise the *Jimblebar Flora and Vegetation Management Plan*, or

(2) shall review and revise the *Jimblebar Flora and Vegetation Management Plan* as and when directed by the CEO.

5-7 The proponent shall implement the most recent version of the *Jimblebar Flora and Vegetation Management Plan* which the CEO has confirmed by notice in writing, addresses the requirements of condition 5-1.

5-8 The proponent shall continue to implement the version of the *Jimblebar Flora and Vegetation Management Plan* or any subsequent revisions as approved by the CEO under condition 5-7*,* until the CEO has confirmed by notice in writing that the plan meets the objective specified in condition 5-1*.*

6 Subterranean Fauna Environmental Management Plan

6-1 The proponent shall manage the implementation of the proposal to meet the following environmental outcome:

(1) protect subterranean fauna so that biological diversity and ecological integrity are maintained, and in particular:

(a) avoid and minimise direct and indirect impacts on the Ethel Gorge aquifer stygobiont community Threatened Ecological Community.

6-2 In order to meet the requirements of condition 6-1, the proponent shall implement the Subterranean Fauna provisions of the *Eastern Pilbara Water Resource Management Plan* (Version 6, April 2018) (the *Subterranean Fauna Environmental Management Plan*).

6-3 In the event that monitoring, tests, surveys or investigations indicates exceedance of threshold criteria specified in the *Subterranean Fauna Environmental Management Plan*, the proponent shall:

(1) report the exceedance in writing to the CEO within seven (7) days of the exceedance being identified;

(2) implement the threshold contingency actions specified in the *Subterranean Fauna Environmental Management Plan* within twenty-four (24) hours and continue implementation of those actions until the CEO has confirmed by notice in writing that it has been demonstrated that the threshold criteria are being met and the implementation of the threshold contingency actions is no longer required;

(3) investigate to determine the cause of the threshold criteria being exceeded;

(4) investigate to provide information for the CEO to determine potential environmental harm or alteration of the environment that occurred due to threshold criteria being exceeded; and

(5) provide a report to the CEO within twenty-one (21) days of the exceedance being reported as required by condition 6-3(1). The report shall include:

(a) details of threshold contingency actions implemented;

(b) the effectiveness of the threshold contingency actions implemented against the threshold criteria;

(c) the findings of the investigations required by conditions 6-3(3) and 6-3(4);

(d) measures to prevent the threshold criteria being exceeded in the future;

(e) measures to prevent, control or abate the environmental harm which may have occurred; and

(f) justification of the threshold remaining, or being adjusted based on better understanding, demonstrating that objectives will continue to be met.

6-4 The exceedance of a threshold criteria (regardless of whether threshold contingency actions have been or are being implemented) represents non-compliance with these conditions.

6-5 The proponent:

(1) may review and revise the *Subterranean Fauna Environmental Management Plan*, or

(2) shall review and revise the *Subterranean Fauna Environmental Management Plan* as and when directed by the CEO.

6-6 The proponent shall implement the most recent version of the *Subterranean Fauna Environmental Management Plan* which the CEO has confirmed by notice in writing, addresses the requirements of condition 6-1.

6-7 The proponent shall continue to implement the version of the *Subterranean Fauna Environmental Management Plan* or any subsequent revisions as approved by the CEO under condition 6-7*,* until the CEO has confirmed by notice in writing that the plan meets the objectives specified in condition 6-1*.*

7 Water Environmental Management Plan

7-1 The proponent shall manage the implementation of the proposal to meet the following environmental outcomes:

(1) maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected, including where relevant avoiding and minimising direct and indirect impacts of the proposal, on:

(a) wetland types which may be poorly represented;

(b) ecosystems which support conservation significant flora/ vegetation and fauna species or communities, including migratory waterbirds, bats, groundwater dependent biota and subterranean fauna; and

(c) ecosystems which support significant amenity, recreation and cultural values.

7-2 In order to meet the requirements of condition 7-1, the proponent shall implement the *Jimblebar Water Management Plan* (Revision 0, November 2019).

7-3 In the event that monitoring, tests, surveys or investigations indicate non-achievement of management target(s) specified in the *Jimblebar Water Management Plan*, the proponent must:

(1) report the non-achievement in writing to the CEO within twenty-one (21) days of the non-achievement being identified;

(2) investigate to determine the cause of the management target(s) not being achieved;

(3) provide a report to the CEO within ninety (90) days of the non-achievement being reported as required by condition 7-3(1). The report shall include:

(a) the cause(s) of the management targets not being achieved;

(b) the findings of the investigation required by condition 7-3(2);

(c) details of revised and/or additional management actions to be implemented to prevent non-achievement of the management target(s); and

(d) relevant changes to proposal activities.

7-4 If monitoring, tests, surveys or investigations indicate that one or more management actions specified in the *Jimblebar Water Management Plan* has not been implemented, the proponent shall:

(1) report the failure to implement the management action(s) in writing to the CEO within seven (7) days of identification;

(2) investigate to determine the cause of the management action(s) not being implemented;

(3) investigate to determine the potential environmental harm or alteration of the environment that occurred due to the failure to implement the management action(s);

(4) provide a report to the CEO within twenty-one (21) days of the reporting required by condition 7-4(1). The report shall include:

(a) the cause of the failure to implement the management actions;

(b) the findings of the investigations required by conditions 7-4(2) and 7-4(3);

(c) relevant changes to proposal activities; and

(d) measures to prevent, control or abate the environmental harm which may have occurred.

7-5 Failure to implement one or more of the management actions specified in the *Jimblebar Water Management Plan* represents non-compliance with these conditions.

7-6 The proponent:

(1) may review and revise the *Jimblebar Water Management Plan*, or

(2) shall review and revise the *Jimblebar Water Management Plan* as and when directed by the CEO.

7-7 The proponent shall implement the most recent version of the *Jimblebar Water Management Plan* which the CEO has confirmed by notice in writing, addresses the requirements of condition 7-1.

7-8 The proponent shall continue to implement the version of the *Jimblebar Water Management Plan* or any subsequent revisions as approved by the CEO under condition 7-6, until the CEO has confirmed by notice in writing that the plan meets the outcomes specified in condition 7-1.

8 Rehabilitation and Decommissioning

8-1 The proponent shall manage the implementation of the proposal to meet the following environmental objective:

(1) ensure that the proposal is decommissioned and the site of the proposal rehabilitated to be safe, stable and non-polluting and in an ecologically appropriate and sustainable manner.

8-2 Within twelve (12) months of the issue of this Statement the proponent shall prepare and submit a Mine Closure Plan in accordance with the Guidelines for Preparing Mine Closure Plans, May 2015, (or any subsequent revisions of the guidelines), to the requirements of the CEO, on advice of the Department of Mines, Industry Regulation and Safety, and the Department of Water and Environmental Regulation.

8-3 The proponent shall review and revise the Mine Closure Plan required by condition 8-2 at intervals not exceeding five (5) years, or as otherwise specified by the CEO, and submit the plan to the CEO at the agreed interval.

8-4 The proponent shall implement the latest revision of the Mine Closure Plan, which the CEO has confirmed by notice in writing, satisfies the requirements of condition 8-2.

8-5 The proponent shall implement the *Jimblebar Mine Closure Plan* (Version 2, August 2019) until the CEO has confirmed by notice in writing the Mine Closure Plan required by condition 8-2 satisfies the requirements of the CEO on advice of the Department of Mines, Industry Regulation and Safety, and the Department of Water and Environmental Regulation.

9 Offsets

9-1 In view of the significant residual impacts and risks as a result of the implementation of the proposal, the proponent shall contribute funds to the Pilbara Environmental Offset Fund calculated pursuant to condition 9-2, subject to any reduction approved by the CEO under condition 9-9.

9-2 The proponent's contribution to the Pilbara Environmental Offset Fund shall be paid biennially, with the amount to be contributed calculated based on the clearing undertaken in each year of the biennial reporting period in accordance with the rates in condition 9-3. The first biennial reporting period shall commence from vegetation clearing activities for the environmental values identified in condition 9-3.

9-3 Calculated on the 2018-2019 financial year, the contribution rates are:

(1) $816 AUD (excluding GST) per hectare of 'Good' to 'Excellent' condition native vegetation, including foraging habitat for ghost bat, cleared within the development envelope within the Hamersley **IBRA** subregion.

(2) $1,632 AUD (excluding GST) per hectare of ‘Good’ to ‘Excellent’ condition native vegetation, including foraging habitat for ghost bat, cleared within the development envelope within the Fortescue **IBRA** subregion.

9-4 From the commencement of the 2018–2019 financial year, the rates in condition 9-3 will be adjusted annually each subsequent financial year in accordance with the percentage change in the **CPI** applicable to that financial year.

9-5 Within three (3) months of the issue of this statement, the proponent shall prepare and submit an Impact Reconciliation Procedure to the CEO, for the CEO to provide written confirmation that the Impact Reconciliation Procedure satisfies the requirements of condition 9-6.

9-6 The Impact Reconciliation Procedure required pursuant to condition 9-5 shall:

(1) state that clearing calculations for the first biennial reporting period will commence from vegetation clearing activities for the environmental values identified in condition 9-3 in accordance with condition 9-2 and end on the second 30 June following this date;

(2) state that clearing calculations for each subsequent biennial reporting period will commence on 1 July of the required reporting period, unless otherwise agreed by the CEO;

(3) include a methodology to calculate the amount of clearing undertaken during each year of the biennial reporting period for each of the environmental values identified in condition 9-3;

(4) indicate the timing and content of the Impact Reconciliation Reports; and

(5) be prepared in accordance with the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (or any subsequent revisions).

9-7 The proponent shall submit an Impact Reconciliation Report in accordance with the Impact Reconciliation Procedure approved in condition 9-5.

9-8 The Impact Reconciliation Report required pursuant to condition 9-7 shall provide the location and spatial extent of the clearing undertaken during each year of each biennial reporting period.

9-9 The proponent may apply in writing and seek the written approval of the CEO to reduce all or part of the contribution payable under condition 9-2 where:

(1) a payment has been made to satisfy a condition of an approval under the *Environment Protection and Biodiversity Conservation Act 1999* in relation to the proposal;

(2) the payment counterbalances impacts of the proposal on matters of national environmental significance; and

(3) the payment counterbalances the significant residual impacts to the environmental value identified in condition 9-3(4).

9-10 The clearing of 4,644 ha of native vegetation previously authorised under Ministerial Statements 683, 809 and 857 prior to 22 October 2015 is exempt from the requirement to offset under condition 9-1.

Schedule 1

Table 1: Summary of the Proposal

Proposal Title	Jimblebar Iron Ore Project – revised proposal
Short Description	The proposal is for mining operations at Jimblebar, located approximately 40 kilometres east of the town of Newman Mining of iron ore deposits will be undertaken above and below the water table. Mining operations will include open pits, overburden storage areas and the construction and operation of associated mine, processing and rail infrastructure. Groundwater will be abstracted for water supply and to dewater the orebodies. Surplus water management will include transfer to Ophthalmia Dam, controlled creek discharge and managed aquifer recharge.

Table 2: Location and authorised extent of physical and operational elements

Column 1	Column 2	Column 3
Element	**Location**	**Authorised Extent**
Mine and associated infrastructure	Figure 1	Clearing of no more than 6,902 ha of native vegetation within the development envelope of 14,206 ha.
Surplus water management	Figure 1	Surplus water management including any or all of the following options: • discharge of up to 16.425 GL/a to Ophthalmia Dam • controlled discharge along Caramulla Creek to extend no further than 34 kilometres from the northern boundary of the development envelope under natural, no-flow conditions • managed aquifer recharge in the Caramulla area to limit groundwater level rise to 25 metres below ground level.

Table 3: Abbreviations and Definitions

Acronym or Abbreviation	Definition or Term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his delegate.
EP Act	*Environmental Protection Act 1986*
GL/a	Gigalitres per annum
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
Pilbara Environmental Offset Fund	The special purpose account called the Pilbara Environmental Offsets Fund Account that has been created pursuant to section 16(1)(d) of the

	Financial Management Act 2006 by the Department of Water and Environmental Regulation.

Figures (attached)

Figure 1 Jimblebar Iron Ore Project Development Envelope and Wetting Front extent (This figure is a representation of the co-ordinates in Schedule 2

Figure 2 Good to Excellent Vegetation in the Hamersley Subregion (Area A) and Good to Excellent Vegetation in the Fortescue Subregion (Area B) (this figure is a representation of the co-ordinates in Schedule 2

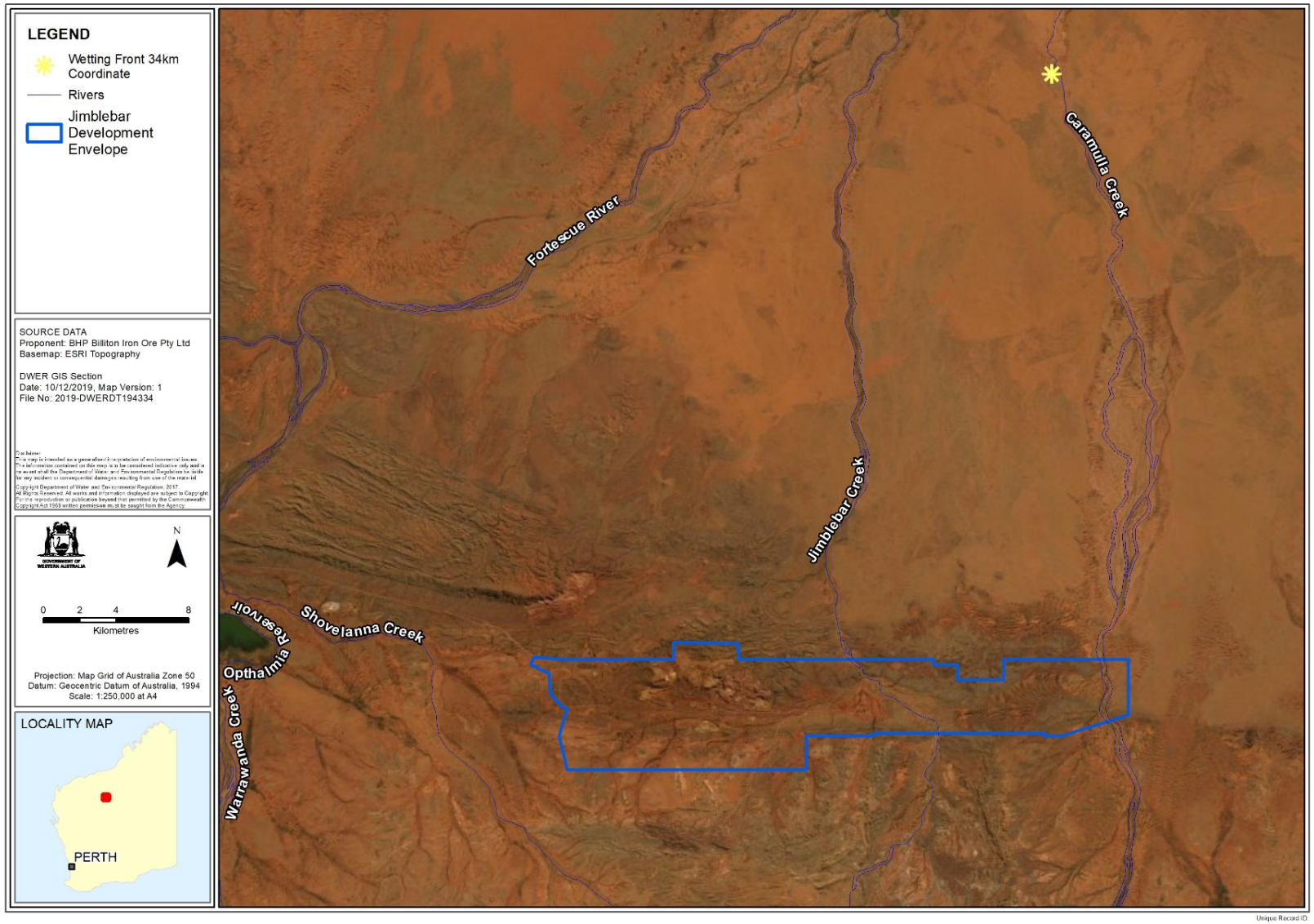

Figure 1: Jimblebar Iron Ore Project Development Envelope and Wetting Front extent

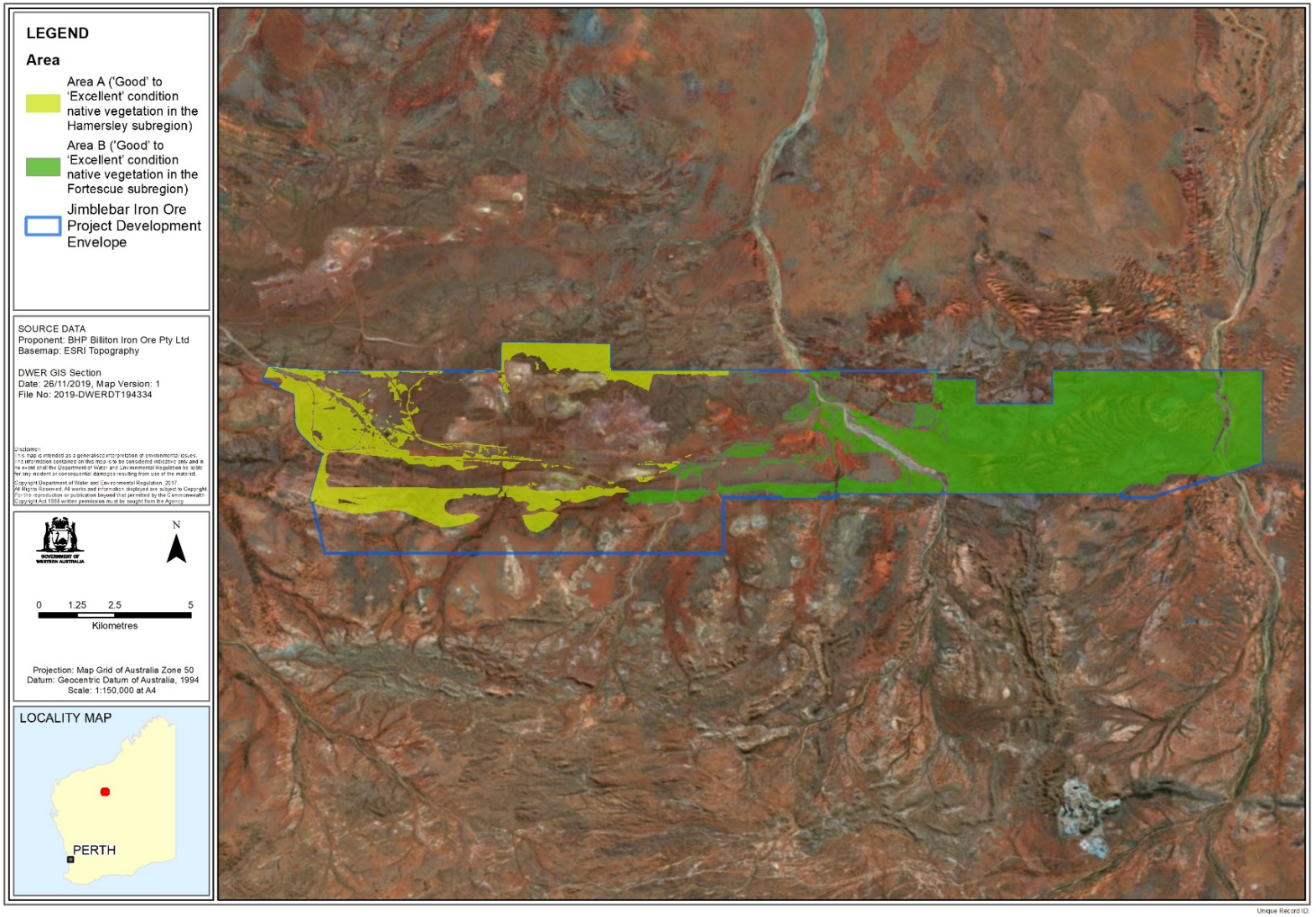

Figure 2: Good to Excellent Vegetation in the Hamersley Subregion (Area A) and Good to Excellent Vegetation in the Fortescue Subregion (Area B)

Schedule 2

Coordinates defining the areas shown in Figures 1 and 2 are held by the Department of Water and Environmental Regulation (DWER) under the following reference numbers:

- Jimblebar Iron Ore Project Revised Development Envelope – DWERTD227752
- Caramulla Creek Wetting Front 34km coordinate – DWERDT227752
- Area A comprising ‘Good’ to ‘Excellent’ vegetation in the Hamersley IBRA subregion development envelope – DWERTD227752
- Area B comprising ‘Good’ to ‘Excellent’ vegetation in the Fortescue IBRA subregion development envelope – DWERTD227752

All co-ordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 1994 (GDA94).