

Application to Amend NVCP CPS 3445/4 Newman to Jimblebar Transmission Line

**Native Vegetation Clearing Permit Amendment
Application Supporting Document**

October 2024



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1 INTRODUCTION

BHP Iron Ore Pty Ltd (BHP) currently operates a number of Iron Ore mines and associated rail and port infrastructure within the Pilbara region of Western Australia (WA). Current mining operations include the:

- Newman Operations consisting of:
 - The Mount Whaleback hub (including Orebodies 29, 30 and 35) located approximately two kilometres (km) west of Newman Township; and
 - The Eastern Ridge hub (Consisting of Orebodies 23, 24, 25, 25 West and 32) located approximately 5 km east of Newman Township;
- Mining Area C / South Flinak located approximately 90 km north west of Newman Township;
- Orebodies 17, 18, 31 and Wheelarra Hill (Jimblebar) Mine located approximately 35 km east of Newman Township; and
- Yandi Mine located approximately 100 km north west of Newman Township.

Ore from the above mining operations is transported to Port Hedland via the BHP Newman to Port Hedland Mainline (and associated spur lines) and is then shipped out through Port Hedland at the BHP facilities at Nelson Point and Finucane Island.

BHP currently holds Native Vegetation Clearing Permit (NVCP) CPS 3445/4 for the purposes of railway construction and maintenance and associated works, installation and relocation of power lines, installation of fibre optic cables and construction and maintenance of water pipelines (**Figure 1**). The permit expires on 30 November 2025, however the full extent of these works is yet to be undertaken. BHP is therefore seeking to:

- Extend the permit duration to 30 November 2035;
- Add a condition limiting the clearing period to 30 November 2030;
- Extend the final reporting date to 30 November 2035;
- Update the Permit Holder to BHP Iron Ore Pty Ltd.;
- Consolidate the permit purpose; and
- Remove a small area of the permit.

No other changes to the permit are required.

In accordance with Part V Division 2 of the *Environmental Protection Act 1986* (EP Act), BHP hereby refers the application to amend NVCP CPS 3445/4 to the Department of Water and Environmental Regulation (DWER).

BHP considers that the proposed amendment application will not result in any significant environmental or social impacts and that the proposed Project complies with the 'Ten Clearing Principles', as defined in Schedule 5 of the EP Act.

1.1 LOCATION

The Amendment Application Area is located immediately north of the town of the Twon of Newman and runs to the western edge of the Jimblebar Mining Operations in the Pilbara region of Western Australia (**Figure 1**).

1.2 TENURE

The Amendment Application Area is located on State Agreement Mineral Lease 244SA and Miscellaneous Licence L52/109.

1.3 LOCAL GOVERNMENT JURISDICTION

The Amendment Application Area is located within the Shire of East Pilbara.

1.4 PROPONENT

The Project is managed and operated by BHP Iron Ore on behalf of the owners, the Mount Newman Joint Venture (NJV). The split between the partners of the NJV is as follows:

- | | |
|--|-----|
| • BHP Minerals Pty Ltd | 85% |
| • Mitsui Iron Ore Corporation Pty Ltd | 10% |
| • Itochu Minerals and Energy Australia Pty Ltd | 8% |

The key contact for this proposal is:

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1.5 PROJECT DESCRIPTION

The proposed works will involve clearing for the purposes of construction and maintenance of railways, power lines, fibre optic cables, water pipelines and all associated activities.

1.6 PROJECT CHARACTERISTICS AND COMMITMENTS.

BHP commits to undertake the Project in accordance with the details set out in **Table 1**.

Table 1 Project Characteristics and Commitments

Permit Characteristics		
Authorising Agency	DWER	
Permit Title	Newman to Jimblebar Transmission Line	
Area to be cleared	260.33 hectares (ha)	
Amendment Application Area	704.48 ha	
Purpose of the permit	Clearing for the purposes of construction and maintenance of railways, power lines, fibre optic cables, water pipelines and all associated activities.	
Tenure	Mineral Lease 244SA Miscellaneous Licence L52/109	
Clearing Duration	Until 30 November 2030	
Permit Duration	Until 30 November 2035	
Proposed Annual Reporting Date	01 October for the previous Financial Year	
Proposed Final Reporting Date	30 November 2035	
Application boundary	Map Reference: <ul style="list-style-type: none"> • PWR_007NVCP_001_RevA_0 • PWR_007NVCP_002_RevB_0 • PWR_007NVCP_003_RevB_0 • PWR_007NVCP_004_RevA_0 • PWR_007NVCP_005_RevA_0 BHP Shapefile D2 Reference: https://waio-dctm.bhp.com/D2/?docbase=bhpbio_od_prod&locateld=0b03c41a848e5d04&application=ManagedDocuments	
Application Commitments		Section
Should any Priority flora populations be identified they will be avoided using a 10 m buffer where practicable.		3.4.2 6.1
Control of established weed populations will be carried out according to BHP's standard Weed Control and Management Procedures.		3.4.3 6.7.4
Active Pebble-mouse mounds will be avoided using a 10 m buffer, where practicable.		3.4.4 6.2
Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.		3.6 6.6 6.9

1.7 NVCP RECORDS

BHP reports on each NVCP in accordance with the permit reporting conditions. BHP reports on each NVCP in accordance with the permit reporting conditions. For a majority of NVCPs this is incorporated into BHP Iron Ore's Annual Environmental Report (AER) which is submitted to government prior to the 01 October each year.

Clearing commenced in 2010 with a total of 52.28 ha cleared and 6.5 ha rehabilitated to the end of FY24 (BHP, 2024). All remaining cleared areas are still required for the purpose for which they were cleared.

Clearing has been minimised by restricting activities to the minimal required for safety and equipment access. Significant fauna have been avoided using the BHP Project Environmental and Heritage Review (PEAHR) procedure. This internal BHP procedure authorises ground disturbing activities. No environmental offsets are required for this NVCP.

2 ASSOCIATED APPROVALS

Any other additional approvals will be sought as required.

3 EXISTING ENVIRONMENT

3.1 CLIMATE

Newman Aero meteorological site (007176) is the closest Bureau of Meteorology (BoM) station to the Amendment Application Area. Average annual rainfall at Newman Aero is 318.0 mm (BOM, 2024a). This is mainly derived from tropical storms and cyclones during summer, producing sporadic, heavy rains over the area. Mean monthly rainfall varies from 4.6 mm in September to 71.6 mm in February (BoM, 2024a). Daily rainfall is highly variable; the highest maximum daily rainfall ranges from 34.8 mm in October, to 305.6 mm in February (BoM, 2024a). The mean maximum temperature in summer months (October to March) is 35.2°C to 39.4°C, and mean maximum temperature in winter (April to September) is between 23.0°C and 32.1°C (BoM, 2024a).

Wittenoom meteorological site (005026) is the closest station to the Amendment Application Area that records daily evaporation. Wittenoom is located approximately 200 km north west of the Amendment Application Area. Mean daily evaporation at Wittenoom throughout the year is 8.6 mm/day (BoM, 2023b), which equates to 3.1 metres per year. Evaporation greatly exceeds rainfall in the region throughout the year and on a month-by-month basis (BoM, 2024b).

3.2 BIOREGION, LANDFORMS AND LAND SYSTEMS

The Amendment Application Area is situated in the following biogeographic sub-regions:

- Hamersley subregion (PIL3) of the Pilbara region described as: “*Mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors, and Eucalyptus leucophloia over Triodia brizoides on skeletal soils of the ranges. The climate is semi-desert tropical, average 300 mm rainfall, usually in summer cyclonic or thunderstorm events. Winter rain is not uncommon. Drainage into either the Fortescue (to the north), the Ashburton to the south, or the Robe to the west. Subregional area is 6,215,092ha*” (Kendrick, 2001).
- Augustus subregion (GAS3) of the Gascoyne region described as: “*Rugged low Proterozoic sedimentary and granite ranges divided by broad flat valleys. Also includes the Narryera Complex and Bryah Basin of the Proterozoic Capricorn Orogen (on northern margin of the Yilgarn Craton), as well as the Archaean Marymia and Sylvania Inliers. Although the Gascoyne River System provides the main drainage of this subregion, it is also the headwaters of the Ashburton and Fortescue Rivers. There are extensive areas of alluvial valley-fill deposits. Mulga woodland with Triodia occur on shallow stony loams on rises, while the shallow earthy loams over hardpan on the plains are covered by Mulga parkland. A desert climate with bimodal rainfall. The subregional area for GAS3 is 10,687,739ha*” (Desmond et al. 2001)

The proposed Amendment Application Area is also located in the following land systems, as mapped by van Vreeswyk et al. (2004):

Boolgeeda:	Stony lower slopes, level stony plains and narrow sub-parallel drainage floors, relief up to 20 metres (m). A common system in shallow valleys below hill systems such as Newman and Rocklea.
Elimunna:	Level to gently undulating stony plains, gilgai plains and drainage tracts derived from basalt, relief up to 15 m.
McKay:	Hills, ridges, plateaux remnants and minor breakaways of sedimentary and meta sedimentary rocks, relief up to 100 m.
Newman:	Rugged high mountains, ridges and plateaux with near vertical escarpments of jaspilite, chert and shale, the second largest system in the survey area and prominent in southern parts (e.g. Ophthalmia Range, Hamersley Range), relief up to 450 m.
River:	Narrow floodplains and major channels.
Washplain:	Level wash plains and tracts receiving more concentrated through flow with prominent grove patterns of vegetation, loamy and clayey soils of variable depth over hardpan, relief less than 10 m.

These Land Systems are well represented in their bioregions.

3.3 GEOLOGY AND SOILS

The Australian Soil Resource Information System (ASRIS) provides soil and land resource information across Australia. The following three soil types occur within the Amendment Application Area (CSIRO, 2021):

- BE6: Extensive flat and gently sloping plains, which sometimes have a surface cover of gravels and on which redbrown hardpan frequently outcrops: chief soils are shallow earthy loams (Um5.3), with associated (Gn) soils of units My5O and Mz23 of Sheet 6. As mapped, there are inclusions of units Oc47 and BB9.
- Fa13: Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5.11) soils on the steeper slopes. Associated are (Dr2.33 and Dr2.32) soils on the limited areas of dissected pediments, while (Um5.52) and (Uf6.71) soils occur on the valley plains.
- Mz25: Plains associated with the Fortescue valley; there is a surface cover of stony gravels close to the ranges and hills: chief soils are acid red earths (Gn2.11) with some neutral red earths (Gn2.12); red-brown hardpan is absent. Associated are areas of calcareous earths (Gc) and loams (Um1) on kunkar, and some hard red (Dr) soils around creek lines.

3.4 FLORA, VEGETATION AND FAUNA

There have been 44 flora and vegetation surveys that intersect the proposed Amendment Application Area. The most relevant are:

- *Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure* (Onshore Environmental, 2014) (**Appendix 1**);
- *East Ophthalmia & Ninga Detailed Flora & Vegetation Survey* (Spectrum Ecology and Spatial, 2022) (**Appendix 2**);
- *Newman to Jimblebar Transmission Line and Newman Town Substation Flora and Vegetation Assessment* (ENV, 2009a) (**Appendix 3**);
- *BHP WAO Jimblebar Eremophila capricornica Targeted Flora Survey* (Biologic, 2021) (**Appendix 4**); and
- *Targeted Survey for Acacia sp. East Fortescue (surrounding OB31)* (Onshore, 2015) (**Appendix 5**).

The Onshore Environmental (2014) *Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore Pilbara Tenure* (**Appendix 1**) undertook a detailed review of all previous flora and vegetation surveys across BHP's Pilbara operations (162 baseline flora and vegetation surveys between 2004 and 2013). This review was supported by field visits where the analysis indicated that further information was required to confirm the exact vegetation associations.

There have been 38 vertebrate fauna surveys that intersect the proposed Amendment Application Area. The most relevant are:

- *Consolidated Fauna Habitat Mapping* (Biologic Environmental Survey, 2017) (**Appendix 6**);
- *East Ophthalmia and Ninga Detailed Vertebrate Fauna Survey* (Biologic, 2022) (**Appendix 7**);
- Jimblebar targeted ghost bat survey (GHD, 2020) (**Appendix 8**); and
- *Newman to Jimblebar Transmission Line and Newman Town Substation terrestrial Fauna Assessment* (ENV, 2009b) (**Appendix 9**).

The Biologic (2017) *Consolidated Fauna Habitat Mapping BHP Billiton Iron Ore Pilbara Tenure* undertook a detailed review of all previous fauna surveys across BHP's Pilbara operations and the outputs from the Onshore Environmental (2014) Consolidation project. This review was supported by field visits where the analysis indicated that further information was required to confirm the fauna habitats.

3.4.1 Vegetation Communities

The Amendment Application Area is located within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara Bioregion (Department of Environment and Heritage, 2005). According to the Government of Western Australia (2013), these bioregions are more than 99.9% vegetated (**Table 2**).

The vegetation within the Amendment Application Area is classified as the following vegetation associations, as mapped by Beard (1975):

- 18 Low woodland; mulga (*Acacia aneura*)
- 29 Sparse low woodland; mulga, discontinuous in scattered groups.
- 82 Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.
- 216 Low woodland; mulga (with spinifex) on rises

There is more than 99% of the pre-European vegetation remaining of these vegetation associations (**Table 2**). The Amendment Application Area is not part of any significant remnant vegetation in the wider regional area.

Table 2 Pre-European extent of vegetation associations occurring within the Amendment Application Area (Shepherd *et al.*, 2001)

Vegetation*		Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Pre-European % in IUCN Class I-IV Reserves
Pilbara IBRA Bioregion		17,808,657	17,733,583	99.58	6.34
Gascoyne IBRA Bioregion		18,075,219	18,067,441	99.96	1.93
Vegetation association 18	WA	19,890,665	19,843,409	99.76	2.13
	Pilbara IBRA	676,556	672,424	99.39	16.78
	Gascoyne IBRA	3,273,579	3,271,339	99.93	2.49
Vegetation association 29	WA	7,903,991	7,900,200	99.95	0.29
	Pilbara IBRA	1,133,219	1,132,939	99.98	1.91
	Gascoyne IBRA	3,802,459	3,799,635	99.93	0.03
Vegetation association 82	WA	2,565,901	2,553,217	99.51	10.25
	Pilbara IBRA	2,563,583	2,550,899	99.51	10.26
	Gascoyne IBRA	2,318	2,318	100.00	0.00
Vegetation association 216	WA	280,759	279,237	99.46	0.00
	Pilbara IBRA	26,669	26,372	98.89	0.00
	Gascoyne IBRA	254,089	252,864	99.52	0.00

A total of 18 broad floristic formations with 52 vegetation associations have been described and mapped within the Amendment Application Area (**Figures 2 and 3 and Table 3**).

Table 3 Vegetation associations of the Amendment Application Area (Onshore 2014; and ENV, 2009)

Broad Floristic Formation	Vegetation Association Description	
*Cenchrus Scattered Tussock Grasses	FP Cc Sccn	Scattered Tussock Grasses of * <i>Cenchrus ciliaris</i> over Scattered Herbs of <i>Sclerolaena cornishiana</i> on pale brown silty clay on floodplains.
*Cenchrus Tussock Grassland	FP Cci ChaAci AbiApr	Tussock Grassland of * <i>Cenchrus ciliaris</i> with Low Woodland of <i>Corymbia hamersleyana</i> and <i>Acacia citrinoviridis</i> over High Shrubland of <i>Acacia bivenosa</i> and <i>Acacia pruinocarpa</i> over Open Hummock Grassland of <i>Triodia pungens</i> on orange sand on floodplains.
	MA CcCs EvAciAthe	Tussock Grassland * <i>Cenchrus ciliaris</i> and * <i>Cenchrus setiger</i> with Low Woodland of <i>Eucalyptus victrix</i> , <i>Acacia citrinoviridis</i> and <i>Atalaya hemiglauca</i> on brown sandy loam on major drainage lines and adjacent flood plains.
	SC CciEpo Aci	Tussock Grassland of * <i>Cenchrus ciliaris</i> and <i>Enneapogon polyphyllus</i> and Low Woodland of <i>Acacia citrinoviridis</i> on orange brown sand and clay on floodplains.
<i>Acacia High Shrubland</i>	FP AaAssAanc Tp	High Shrubland of <i>Acacia aptaneura</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia ancistrocarpa</i> over Very Open Hummock Grassland of <i>Triodia pungens</i> on red brown sandy loam on floodplains and medium drainage lines.
<i>Acacia Low Open Forest</i>	SA AanApr Tpu	Low Open Forest of <i>Acacia pteraneura</i> and <i>Acacia pruinocarpa</i> over Open Hummock Grassland of <i>Triodia pungens</i> on red sand clay on plains.

Broad Floristic Formation	Vegetation Association Description	
Acacia Low Open Woodland	FP AaAciApr AsyAssAb Tp	Low Open Woodland of <i>Acacia aptaneura</i> , <i>Acacia citrinoviridis</i> and <i>Acacia pruinoarpa</i> over Open Shrubland of <i>Acacia synchronicia</i> , <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Acacia bivenosa</i> over Very Open Hummock Grassland of <i>Triodia pungens</i> on red brown clay loam on floodplains and medium drainage lines.
	FP AaAprCh ErfrAteDope AriChfArc	Low Open Woodland of <i>Acacia aptaneura</i> , <i>Acacia pruinoarpa</i> and <i>Corymbia hamersleyana</i> with Open Shrubland of <i>Eremophila fraseri</i> , <i>Acacia tetragonophylla</i> and <i>Dodonea petiolaris</i> over Tussock Grassland of <i>Aristida inaequiglumis</i> , <i>Chrysopogon fallax</i> and <i>Aristida contorta</i> on red sandy loam on floodplains.
Acacia Low Woodland	FP AciChAa AancApyPI TtAriCc	Low Woodland of <i>Acacia citrinoviridis</i> , <i>Corymbia hamersleyana</i> and <i>Acacia aptaneura</i> over High Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> and <i>Petalostylis labicheoides</i> over Very Open Tussock Grassland of <i>Themeda triandra</i> , <i>Aristida inaequiglumis</i> and * <i>Cenchrus ciliaris</i> on brown sandy loam on floodplains and medium drainage lines.
Acacia Open Scrub	AOS2	Open Scrub of <i>Acacia melleodora</i> , <i>Petalostylis labicheoides</i> and <i>A. ancistrocarpa</i> over Very Open Hummock Grassland of <i>Triodia wiseana</i> and <i>T. pungens</i> with Scattered Low Trees of <i>Corymbia hamersleyana</i> , <i>Eucalyptus gamophylla</i> (Mallee) and <i>E. xerothermica</i> on Red-Brown Loam on Minor Drainage Lines.
Acacia Open Shrubland	SA AaCocTb	Open shrubland of <i>Acacia aptaneura</i> with lower shrubland of <i>Grevillea striata</i> , <i>Eremophila forrestii</i> subsp. <i>forrestii</i> with low open woodland of <i>Corymbia candida</i> over very open hummock grassland of <i>Triodia basedowii</i> and very open tussock grassland of <i>Aristida pruinoso</i> , and * <i>Cenchrus ciliaris</i> on orange sandy clay plains.
	SA AinErer	High open shrubland of <i>Acacia incurvaneura</i> , (+/-) <i>Acacia catenulata</i> subsp. <i>occidentalis</i> , and <i>Acacia ayersiana</i> over scattered tussock grasses of <i>Eragrostis eriopoda</i> , <i>Eriachne helmsii</i> , and or <i>Digitaria brownii</i> on orange sandy clay plains.
	SS TeAsEse	open hummock grassland of <i>Triodia epactia</i> and <i>Triodia angusta</i> with very open tussock grassland of * <i>Cenchrus ciliaris</i> under Open shrubland of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> , <i>Stylobasium spathulatum</i> , and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> . over and low open woodland of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> or <i>Corymbia hamersleyana</i> on orange sandy stone plains.
Acacia Shrubland	AS3	Open Scrub (to Open Shrubland) of <i>Acacia aneura</i> , <i>A. sclerosperma</i> and <i>A. bivenosa</i> over Hummock Grassland of <i>Triodia basedowii</i> , <i>T. pungens</i> and <i>T. sp.</i> Shovelanna Hill (S. van Leeuwen 3835) with Scattered Low Trees of <i>Eucalyptus xerothermica</i> and <i>E. gamophylla</i> (Mallee) on Red-Brown Sandy Loam on Plains.
	MI AmAancPI ChEII TtAri	Shrubland of <i>Acacia monticola</i> , <i>Acacia ancistrocarpa</i> and <i>Petalostylis labicheoides</i> with Scattered Low Trees of <i>Corymbia hamersleyana</i> and <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Tussock Grassland of <i>Themeda triandra</i> and <i>Aristida inaequiglumis</i> on red loamy sand on minor drainage lines.
Corymbia Low Open Woodland	MI CocAa CcCs Tb	Low Open Woodland of <i>Corymbia candida</i> subsp. <i>dipsodes</i> and <i>Acacia aptaneura</i> over Open Tussock Grassland of * <i>Cenchrus ciliaris</i> and * <i>Cenchrus setiger</i> and Very Open Hummock Grassland of <i>Triodia basedowii</i> on red brown loam on floodplains and minor drainage lines.
	SP ChEoCd AancApaAad s TbTscTs	Low Open Woodland of <i>Corymbia hamersleyana</i> , <i>Eucalyptus odontocarpa</i> and <i>Corymbia deserticola</i> subsp. <i>deserticola</i> over Open Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia pachyacra</i> and <i>Acacia adsurgens</i> over Open Hummock Grassland of <i>Triodia basedowii</i> , <i>Triodia schinzii</i> and <i>Triodia sp.</i> Shovelanna Hill (S. van Leeuwen 3835) on red brown sandy loam on footslopes and stony plains.
Eucalyptus Low Woodland	ME TtEuaEte ApyAtpPI EvCh	Tussock Grassland of <i>Themeda triandra</i> , <i>Eulalia aurea</i> and <i>Eriachne tenuiculmis</i> with High Shrubland of <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> , <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>Petalostylis labicheoides</i> and Open Woodland of <i>Eucalyptus victrix</i> and <i>Corymbia hamersleyana</i> on red brown silty loam on medium drainage lines and flood plains.
Eucalyptus Open Woodland	MA EcoAciCyix	Low open woodland of <i>Eucalyptus camaldulensis</i> and <i>Eucalyptus victrix</i> over high open shrubland of <i>Acacia citrinoviridis</i> and (+/-) <i>Melaleuca glomerata</i> over very open sedgeland of <i>Cyperus ixiocarpus</i> and <i>Cyperus vaginatus</i> with very open tussock grassland of * <i>Cenchrus ciliaris</i> on orange sandy clay in major creek lines.
	MI EgAdTp	Low open woodland of <i>Eucalyptus gamophylla</i> over tall shrubland of <i>Acacia dictyophleba</i> , <i>Petalostylis labicheoides</i> and <i>Grevillea wickhamii</i> over hummock grassland of <i>Triodia pungens</i> on orange sandy clay in minor drainage line.

Broad Floristic Formation	Vegetation Association Description	
<i>Eucalyptus</i> Woodland	MA EcrEv AciApyMg CcEuaTt	Woodland of <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> and <i>Eucalyptus victrix</i> over High Open Shrubland of <i>Acacia citrinoviridis</i> , <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> and <i>Melaleuca glomerata</i> over Tussock Grassland of * <i>Cenchrus ciliaris</i> , <i>Eulalia aurea</i> and <i>Themeda triandra</i> on brown clay loam on banks of major drainage lines.
	MA EcrEvi Aci Mgl	Woodland of <i>Eucalyptus camaldulensis</i> and <i>Eucalyptus victrix</i> with Low Woodland of <i>Acacia citrinoviridis</i> and High Open Shrubland of <i>Melaleuca glomerata</i> with Low Scattered Shrubs of <i>Corchorus crozophorifolius</i> over Scattered Hummock Grass of <i>Triodia pungens</i> with Open Tussock Grassland of * <i>Cenchrus ciliaris</i> and <i>Eulalia aurea</i> with Scattered Sedges of <i>Cyperus vaginatus</i> on orange sandy clay in major creek lines.
	MA EvAciEcr TercCocrApy p CcEuaTt	Woodland of <i>Eucalyptus victrix</i> , <i>Acacia citrinoviridis</i> and <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> over Low Open Shrubland of <i>Tephrosia rosea</i> var. <i>clementii</i> , <i>Corchorus crozophorifolius</i> and <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> over Very Open Tussock Grassland of * <i>Cenchrus ciliaris</i> , <i>Eulalia aurea</i> and <i>Themeda triandra</i> on brown loamy sand on channels of major drainage lines.
<i>Glinus</i> Herbs	ME Gll Ev Sen	Herbs of <i>Glinus lotoides</i> with Low Open Woodland of <i>Eucalyptus victrix</i> and Low Scattered Shrubs of <i>Senna notabilis</i> on pale brown loam on medium drainage lines.
<i>Themeda</i> Tussock Grassland	ME TtChfEua ExEvCh PIApaApy	Tussock Grassland of <i>Themeda triandra</i> , <i>Chrysopogon fallax</i> and <i>Eulalia aurea</i> with Low Open Woodland of <i>Eucalyptus xerothermica</i> , <i>Eucalyptus victrix</i> and <i>Corymbia hamersleyana</i> and Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia pachyacra</i> and <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> on red sandy loam on medium drainage lines.
<i>Triodia</i> Hummock Grassland	CP TwTa Ese AbPIApy	Hummock Grassland of <i>Triodia wiseana</i> and <i>Triodia angusta</i> with Open Mallee of <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> and Open Shrubland of <i>Acacia bivenosa</i> , <i>Petalostylis labicheoides</i> and <i>Acacia pyrifolia</i> var. <i>pyrifolia</i> on light brown clay loam on calcrete plains and rises.
	FP Tb AaApr Erff	Hummock Grassland of <i>Triodia basedowii</i> with Low Open Woodland of <i>Acacia aptaneura</i> and <i>Acacia pruinocarpa</i> over Open Shrubland of <i>Eremophila forrestii</i> subsp. <i>forrestii</i> on red sandy loam on floodplains.
	FP Tp EtEg AbAancPI	Hummock Grassland of <i>Triodia pungens</i> with Very Open Mallee of <i>Eucalyptus trivalva</i> and <i>Eucalyptus gamophylla</i> over Shrubland of <i>Acacia bivenosa</i> , <i>Acacia ancistrocarpa</i> and <i>Petalostylis labicheoides</i> on red brown loam on unisided drainage tracts on floodplains.
	HC TpTs EII AaAkAsi	Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with Scattered Low Trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Scattered Tall Shrubs of <i>Acacia aptaneura</i> , <i>Acacia kempeana</i> and <i>Acacia sibirica</i> on red brown loam on hill crests, hill slopes and breakaway slopes.
	HC TwTbrTp EIICh AmaGrwhAb	Hummock Grassland of <i>Triodia wiseana</i> , <i>Triodia brizoides</i> and <i>Triodia pungens</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over High Open Shrubland of <i>Acacia maitlandii</i> , <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> and <i>Acacia bivenosa</i> on red brown sandy loam on hill crests and upper hill slopes.
	HS Tb EII AbAiPI	Hummock Grassland of <i>Triodia basedowii</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over Open Shrubland of <i>Acacia bivenosa</i> , <i>Acacia inaequilatera</i> and <i>Petalostylis labicheoides</i> on red brown sandy loam on lower hill slopes.
	HS Ts	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) on red brown sandy loam on hill slopes.
	HS TsAbEII	Hummock grassland of <i>Triodia vanleeuwenii</i> and <i>Triodia pungens</i> with very open tussock grassland of <i>Eriachne lanata</i> under open shrubland of <i>Acacia bivenosa</i> and or <i>Acacia hilliana</i> and woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> on stony hillslopes.
	HS TsTwTp EIICh AhiAaa	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835), <i>Triodia wiseana</i> and <i>Triodia pungens</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Corymbia hamersleyana</i> over Low Open Shrubland of <i>Acacia hilliana</i> and <i>Acacia adoxa</i> var. <i>adoxo</i> on red brown sandy loam on hill slopes.
	HS Tw EIIChHc AancAbAa	Hummock Grassland of <i>Triodia wiseana</i> with Low Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> , <i>Corymbia hamersleyana</i> and <i>Hakea chordophylla</i> and Open Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia bivenosa</i> and <i>Acacia aptaneura</i> on red sandy loam on hill slopes.

Broad Floristic Formation	Vegetation Association Description	
	MI TsTp AancAmGrw h	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) and <i>Triodia pungens</i> with Shrubland of <i>Acacia ancistrocarpa</i> , <i>Acacia monticola</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> on brown sandy loam on minor drainage lines.
	RP Tpu EsoExe AciAscAbi	Hummock Grassland of <i>Triodia pungens</i> and Low Woodland of <i>Eucalyptus socialis</i> and <i>Eucalyptus xerothermica</i> over High Open Shrubland of <i>Acacia citrinoviridis</i> , <i>Acacia sclerosperma</i> , and <i>Acacia bivenosa</i> and Very Open Tussock Grassland of <i>Cenchrus ciliaris</i> and <i>Paraneurachne muelleri</i> on rocky plains.
	SA Tb ChEg ScpBeKep	Hummock Grassland of <i>Triodia basedowii</i> with Low Open Woodland of <i>Corymbia hamersleyana</i> and <i>Eucalyptus gamophylla</i> over Low Open Shrubland of <i>Scaevola parvifolia</i> , <i>Bonamia erecta</i> and <i>Kennedia prorepens</i> on red loamy sand on sand plains.
	SP TbTp HIAancAi Ch	Hummock Grassland of <i>Triodia basedowii</i> and <i>Triodia pungens</i> with High Open Shrubland of <i>Hakea lorea</i> subsp. <i>lorea</i> , <i>Acacia ancistrocarpa</i> and <i>Acacia inaequilatera</i> and Scattered Low Trees of <i>Corymbia hamersleyana</i> on red brown loamy sand on stony plains.
	SP TpTb Eg PIAbAanc	Hummock Grassland of <i>Triodia pungens</i> and <i>Triodia basedowii</i> with Open Mallee of <i>Eucalyptus gamophylla</i> and Shrubland of <i>Petalostylis labicheoides</i> , <i>Acacia bivenosa</i> and <i>Acacia ancistrocarpa</i> on red brown loamy sand on stony plains and footslopes.
	SP TpTwTs ErfrSegpSea o	Hummock Grassland of <i>Triodia pungens</i> , <i>Triodia wiseana</i> and <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with Open Shrubland of <i>Eremophila fraseri</i> , <i>Senna glutinosa</i> subsp. <i>pruinosa</i> and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> on red brown loamy sand on stony plains and hill slopes.
	SP Ts Ai	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with High Open Shrubland of <i>Acacia inaequilatera</i> on red brown loamy sand on lower hill slopes and stony plains.
	SS TbApaCh	Hummock grassland of <i>Triodia basedowii</i> with scattered tussock grasses of <i>Paraneurachne muelleri</i> and <i>Eragrostis eriopoda</i> under open shrubland of <i>Acacia pachyacra</i> , <i>Acacia aptaneura</i> , and <i>Hakea chordophylla</i> and scattered tall <i>Corymbia hamersleyana</i> trees on orange sandy stone plains.
	THG6	Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) with Open Shrubland of <i>Acacia bivenosa</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> with Scattered Low Trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> on Red-Brown Skeletal Loam on Hill Slopes.
	UH TsSeglCh	Hummock grassland of <i>Triodia vanleeuwenii</i> , and <i>Triodia pungens</i> with very open tussock grassland of <i>Paraneurachne muelleri</i> under open shrubland of <i>Senna glutinosa</i> subsp. <i>x luerssenii</i> , (+/-) <i>Acacia bivenosa</i> and <i>Grevillea wickhamii</i> subsp. <i>aprica</i> and woodland of <i>Corymbia deserticola</i> subsp. <i>deserticola</i> , <i>Corymbia hamersleyana</i> , and <i>Eucalyptus gamophylla</i> on orange sandy stone undulating low hills.
<i>Triodia</i> Open Hummock Grassland	TOHG1	Open Hummock Grassland of <i>Triodia schinzii</i> with Open Shrubland of <i>Acacia pachyacra</i> , <i>A. aneura</i> var <i>?pilbarana</i> and <i>A. catenulata</i> subsp. <i>occidentalis</i> with Scattered Mallees of <i>Eucalyptus gamophylla</i> on Red-Brown Clay Loam on Sand Plains.
	TOHG2	Open Hummock Grassland of <i>Triodia angusta</i> and <i>Triodia pungens</i> with Scattered Shrubs of <i>Acacia tetragonophylla</i> , <i>A. bivenosa</i> and <i>Senna glutinosa</i> subsp. <i>glutinosa</i> with Scattered Low Trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>E. trivalva</i> (Mallee) on Red-Brown Sandy Loam on Hill Slopes.
	TOHG3	Open Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835) and <i>T. wiseana</i> with Open Shrubland of <i>Acacia bivenosa</i> with Scattered Mallees of <i>Eucalyptus gamophylla</i> and <i>E. leucophloia</i> subsp. <i>leucophloia</i> (Trees) on Red-Brown Skeletal Loam on a Low Hill Slopes.
	TOHG4	Open Hummock Grassland of <i>Triodia</i> sp. Shovelanna Hill (S. van Leeuwen 3835), <i>T. pungens</i> and <i>T. wiseana</i> with Scattered shrubs of <i>Acacia bivenosa</i> , <i>A. synchronicia</i> and <i>A. tetragonophylla</i> on Red-Brown Loam on Low Rocky Hill Slopes.
	SL TvuTpu EIIApr SggAbi	Open Hummock Grassland of <i>Triodia vanleeuwenii</i> and <i>Triodia pungens</i> with Open Woodland of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and <i>Acacia pruinocarpa</i> over High Open Shrubland of <i>Senna glutinosa</i> subsp. <i>glutinosa</i> and <i>Acacia bivenosa</i> on orange sand clay slopes.

Broad Floristic Formation	Vegetation Association Description	
	SP TI AancApa ApAprCh	Open Hummock Grassland of <i>Triodia lanigera</i> with Open Shrubland of <i>Acacia ancistrocarpa</i> and <i>Acacia pachyacra</i> and Scattered Low Trees of <i>Acacia paraneura</i> , <i>Acacia pruinocarpa</i> and <i>Corymbia hamerselyana</i> on red sandy loam on stony plains.
<i>Typha</i> Sedges	MA TydCyv EcrEv AciAcp	Sedges of <i>Typha domingensis</i> and <i>Cyperus vaginatus</i> with Open Woodland of <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> and <i>Eucalyptus victrix</i> over Low Open Woodland of <i>Acacia citrinoviridis</i> and <i>Acacia coriacea</i> subsp. <i>pendens</i> on brown clayey sand on permanent pools along major drainage lines.

The Amendment Application Area intersects the boundary of one TEC: the Ethel Gorge aquifer stygobiont community. Clearing of vegetation is unlikely to impact this subterranean community.

None of the vegetation associations or landforms identified within the boundary of the Amendment Application Area are associated with a TEC or PEC. The closest PEC is more than 30 km north of the Amendment Application Area.

The distinct mapped broad floristic communities and vegetation associations identified within Amendment Application Area extend or occur beyond the project boundary. It is considered unlikely that any changes in vegetation associations and local species over the time since the vegetation consolidation project would lead to elevated significance of the vegetation given that none of the vegetation associations identified within the Amendment Application Area were affiliated with any TECs or PECs and there are no vegetation associations within the Amendment Application Area that would be likely to be included in any updates to TEC or PEC listings.

Vegetation condition within the Amendment Application Area ranges from excellent to good.

3.4.2 Significant Flora

No species listed under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) or gazetted as Threatened Flora species under the *Biodiversity Conservation Act, 2016* (BC Act) or listed as Priority Flora by the Department of Biodiversity Conservation and Attractions (DBCA) have been recorded within the Amendment Application Area.

Should any Priority flora populations be identified they will be avoided using a 10 m buffer where practicable.

3.4.3 Weeds

Fifteen introduced flora species (weeds) have been recorded within the Amendment Application Area (**Table 4**). Control of established weed populations will be carried out according to BHP's standard *Weed Control and Management Procedures*.

Table 4 Introduced Flora of the Amendment Application Area

Species	Common Name	DPAW Rating (DPAW, 2016)	Declared Pest ¹
* <i>Aerva javanica</i>	Kapok Bush	High and Rapid	No
* <i>Bidens bipinnata</i>	Bipinnate Beggartick	Unknown and Rapid	No
* <i>Cenchrus ciliaris</i>	Buffel Grass	High and Rapid	No
* <i>Cenchrus setiger</i>	Birdwood Grass	High and Rapid	No
* <i>Citrullus amarus</i>	Pie Melon	Unknown and Moderate	No
* <i>Citrullus colocynthis</i>	Wild Watermelon	Unknown and Moderate	No
* <i>Cynodon dactylon</i>	Couch	High and Rapid	No
* <i>Datura leichhardtii</i>	Native Thornapple	Unknown and Unknown	No
* <i>Echinochloa colona</i>	Awnless Barnyard Grass	High and Rapid	No
* <i>Erigeron bonariensis</i>	Flaxleaf Fleabane	Not listed	No
* <i>Lactuca serriola</i>	Prickly Lettuce	Not listed	No
* <i>Malvastrum americanum</i>	Spiked Malvastrum	High and Rapid	No
* <i>Rumex vesicarius</i>	Ruby Dock	High and Rapid	No
* <i>Setaria verticillata</i>	Whorled Pigeon Grass	High and Rapid	No
* <i>Vachellia farnesiana</i>	Mimosa Bush	High and Rapid	No

¹ Biosecurity and Agriculture Management Act, 2007 (BAM Act) s22

3.4.4 Fauna Habitats and Significant Fauna

Seven vertebrate fauna habitats have been identified within the Amendment Application Area (Figures 4 and 5):

1. **Drainage Area / Floodplain:** Characterised by *Eucalyptus xerothermica* and *Corymbia hamersleyana* woodland over broad-leaved *Acacia* shrubland on sandy loam soils sometimes with exposed rocky areas. These can have high vegetation density, complexity and diversity, and because they tend to occur on accretional or depositional areas, and often have deeper and richer soils than other fauna habitats. Grasses tend to be dominated by tussock grasses rather than spinifex, or the weed Buffel Grass **Cenchrus ciliaris*.
2. **Minor Drainage Line:** Located within the minor gullies and depressions, generally through the Crest/Slope habitat. Consists primarily of *Acacia* low shrubland. The understorey generally lacks density and often consists solely of sparse tussock grassland, often including the weed Buffel Grass **Cenchrus ciliaris* where it has been introduced. The substrate can be sandy in places but generally consists of a skeletal loam gravel or stone.
3. **Major Drainage Line:** Major Drainage Lines comprise mature River Red Gums, Coolibahs and stands of Silver Cadjeput over river pools. Open, sandy or gravelly riverbeds characterise this habitat type. In ungrazed areas, the vegetation adjacent to the main channel or channels is denser, taller and more diverse than adjacent terrain and can include reedbeds around pools.
4. **Mulga:** This habitat includes woodlands and other ecosystems in which Mulga (*Acacia aneura*) is dominant, either as the principal *Acacia* species or mixed with others. It consists of disintegrating groves on stony soils with spinifex. This habitat type is grouped with other habitat occurring on the plains; however it is noted that small groves of Mulga occur on ridgelines.
5. **Sand Plain:** Sand Plain habitat is characterised by relatively deep sandy soils supporting dense spinifex grasslands and sparse shrubs. This habitat transitions into patches of Mulga in places. This habitat often occurs as terraces along Major Drainage Lines.
6. **Stony Plain:** These are erosional surfaces of gently undulating plains, ridges and associated footslopes. Mainly support hard spinifex (and occasionally soft spinifex) with a mantle of gravel and pebbles.
7. **Hillcrest / Hillslope:** These fauna habitats tend to be more open and structurally simple due to their recent depositional history than other fauna habitats, and are dominated by varying species of spinifex. A common feature of these habitats is a rocky substrate, often with exposed bedrock, and skeletal red soils. These are usually dominated by *Eucalyptus* woodlands, *Acacia* and *Grevillea* scrublands and *Triodia* spp. low hummock grasslands.

The surveys undertaken across the Amendment Application Area have resulted in one fauna species of significance being recorded from within the Amendment Application Area (Figures 4 and 5):

- Western Pebble-mound Mouse (*Pseudomys chapmani*) (DBCAs Priority 4).

Based on the occurrence of the habitat types and significant fauna species previously recorded in the vicinity an additional 16 significant fauna species are considered to potentially occur within the Amendment Application Area (i.e. those considered 'likely' or 'possible' to occur within the Amendment Application Area):

- Black-tailed Godwit (*Limosa limosa*) (Migratory EPBC Act and BC Act);
- Brush-tailed Mulgara (*Dasyercus blythi*) (DBCAs Priority 4);
- Common Greenshank (*Tringa nebularia*) (Migratory EPBC Act and BC Act);
- Common Sandpiper (*Actitis hypoleucos*) (Migratory EPBC Act and BC Act);
- Fork-tailed Swift (*Apus pacificus*) (Migratory EPBC Act and BC Act);
- Ghost Bat (*Macroderma gigas*) (Vulnerable EPBC Act; Vulnerable BC Act);
- Glossy Ibis (*Plegadis falcinellus*) (Migratory EPBC Act and BC Act);
- Grey Falcon (*Falco hypoleucos*) (Vulnerable, EPBC Act; Vulnerable, BC Act);
- Marsh Sandpiper (*Tringa stagnatilis*) (Migratory EPBC Act and BC Act);
- Pilbara Flat-headed Blind-snake (*Anilius ganeil*) (DBCAs Priority 1);
- Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*) (Vulnerable, EPBC Act; Vulnerable, BC Act);
- Pilbara Olive Python (*Liasis olivaceus barroni*) (Vulnerable, EPBC Act; Vulnerable, BC Act);
- Sharp-tailed Sandpiper (*Calidris acuminata*) (EPBC Act and BC Act);

- Southern Whiteface (*Aphelocephala leucopsis*) (Vulnerable, EPBC Act);
- Spotted Ctenotus (*Ctenotus uber* subsp. *johnstonii*) (DBCA Priority 2); and
- Wood Sandpiper (*Tringa glareola*) (EPBC Act and BC Act);

An assessment of the potential impact of the proposed clearing on the species of significant fauna that may occur in the Amendment Application Area is provided in **Table 5**.

Table 5 Significant Fauna Potentially Occurring within the Amendment Application Area

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Birds					
Black-tailed Godwit (<i>Limosa limosa</i>)	Migratory EPBC Act Migratory BC Act	The Black-tailed Godwit is an uncommon summer non-breeding migratory shorebird that occurs along most of the coast of Western Australia (Geering et al. 2007). It inhabits fresh and brackish wetlands as well as inter-tidal mudflats (Geering et al. 2007). This Migratory bird breeds off the coast of Mongolia and Siberia. It migrates to Australian waters in September to May (Pizzey and Knight 2007).	The Black-tailed Godwit may overfly the Amendment Application Area as it has been recorded within the vicinity of Ophthalmia Dam.	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.
Common Greenshank (<i>Tringa nebularia</i>)	Migratory EPBC Act Migratory BC Act	The Common Greenshank is a nonbreeding migratory shorebird common along most of the coast of Western Australia (Geering et al. 2007). It inhabits intertidal mudflats as well as fresh and saltwater wetlands of the coast or inland (Geering et al. 2007).	The small areas of Major Drainage Line habitat provide the freshwater wetlands preferred by this species. The Common Greenshank has been recorded in the broader region and may overfly the Amendment Application area on its way to its preferred habitat near Ophthalmia Dam.	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.
Common Sandpiper (<i>Actitis hypoleucos</i>)	Migratory EPBC Act Migratory BC Act	<i>Actitis hypoleucos</i> is a nonbreeding migratory shorebird which utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags (Geering et al. 2007).	The small areas of Major Drainage Line habitat provide the freshwater wetlands preferred by this species. <i>Actitis hypoleucos</i> has been recorded in the broader region and may overfly the Amendment Application area on its way to its preferred habitat near Ophthalmia Dam.	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.
Fork-tailed Swift (<i>Apus pacificus</i>)	Migratory EPBC Act Migratory BC Act	The Fork-tailed Swift breeds in north-east and east Asia, wintering in Australia and southern New Guinea (Johnstone and Storr, 1998). Fork-tailed Swifts are entirely aerial within the Pilbara and may forage sporadically over the Amendment Application Area in the summer months, associated with thunderstorms and cyclonic systems (Johnstone and Storr, 1998).	The Fork-tailed Swift is largely an aerial species and has a broad distribution across much of Western Australia. It is viewed as a nomadic species and may fly over the Amendment Application Area.	Possible	Negligible As this species is entirely aerial and not reliant on terrestrial habitats, the impact to this species is considered to be negligible.

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Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Glossy Ibis (<i>Plegadis falcinellus</i>)	Migratory EPBC Act Migratory BC Act	The Glossy Ibis inhabits areas of freshwater wetlands, irrigated areas, and margins of dams, floodplains, brackish and saline wetlands, tidal mudflats, pastures, lawns and public gardens (Johnstone and Storr, 2004). This species is a casual vagrant in dry and hilly areas and is mainly a non-breeding visitor to Western Australia (Johnstone and Storr, 1998).	This species may forage within the Amendment Application Area when surface water is present, but is more likely to overfly the Amendment Application Area to reach its preferred habitat at Ophthalmia Dam	Possible	Low This species is wide ranging, and is unlikely to breed within the Application Area. It is also unlikely to rely just on habitats within the Application Area, given that suitable habitat occurs in the Application Area surrounds.
Grey Falcon (<i>Falco hypoleucos</i>)	Vulnerable (EPBC Act) Vulnerable (BC Act)	The Grey Falcon occurs at low densities across inland Australia. This species frequents timbered lowlands, particularly Acacia shrublands that are crossed by tree-lined drainage systems (Threatened Species Scientific Committee, 2020). The species also frequents spinifex and tussock grassland.	This species may forage within the Amendment Application Area, but is more likely to overfly the Amendment Application Area to reach its preferred habitat at Ophthalmia Dam	Possible	Low There is no suitable nesting habitat within the Amendment Application Area. Given that the habitat for this species occurs extensively throughout the Pilbara and its ability to egress from the area, the proposed clearing activities will have negligible impact on the Grey Falcon.
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	Migratory EPBC Act Migratory BC Act	The Marsh Sandpiper inhabits fresh or brackish wetlands including rivers, sewage farms, drains, lagoons and swamps (Birds Australia, 2010).	This species may forage within the Amendment Application Area when surface water is present, but is more likely to overfly the Amendment Application Area to reach its preferred habitat at Ophthalmia Dam	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	Migratory EPBC Act Migratory BC Act	The Sharp-tailed Sandpiper is a summer non-breeding migratory shorebird that occurs along most of the coast of Western Australia except for the south coast, and in well-watered parts of the interior and casually in the arid east south of Lake Gregory (Johnstone and Storr 1998). The Sharp-tailed Sandpiper uses fresh and salt water wetlands as its preferred habitat. Eighty Mile Beach has peak numbers in August to September (Johnstone and Storr, 1998). It inhabits both coastal and inland areas but prefers non-tidal fresh or brackish wetlands (Geering <i>et al.</i> , 2007).	This species may forage within the Amendment Application Area when surface water is present, but is more likely to overfly the Amendment Application Area to reach its preferred habitat at Ophthalmia Dam	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.

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Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Southern Whiteface (Aphelocephala leucopsis)	Vulnerable (EPBC Act)	The southern whiteface is a small stocky thornbill-like bird which occurs across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range (Schodde & Mason 1999). Southern whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both (Higgins & Peter 2002). They forage almost exclusively on the ground, within ranges, foothills and lowlands, and plains habitats with low tree densities (typically <i>Acacia</i> or <i>Eucalypts</i>) and an herbaceous understorey litter cover (Higgins & Peter 2002).	There is a single record of this species 2.5 km south of the Amendment Application Area and given this species sedentary nature it is possible it may forage within the Mulga woodland and drainage area habitats of the Amendment Application Area.	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.
Mammals					
Brush-tailed Mulgara (<i>Dasyercus blythi</i>)	Priority 4 (DBCAs) (only Brush-tailed Mulgara)	Brush-tailed mulgaras occur in a range of vegetation types, however, the principal habitat is mature hummock grasslands of spinifex, especially <i>Triodia basedowii</i> and <i>T. pungens</i> (Masters <i>et al.</i> , 2003). Note: Woolley, <i>et. al.</i> (2013) noted that the Crest-tailed Mulgara (<i>Dasyercus cristicauda</i>) is unlikely to occur within the Pilbara.	Sandplain habitat of the Amendment Application Area represent suitable habitat for this species. Sandplains are present across the Amendment Application Area and are common in the adjacent to the Amendment Application Area and in the broader region. This species may forage within the Amendment Application Area however due to the small scale linear nature of clearing it is unlikely that this species would be impacted.	Possible	Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.
Ghost Bat (<i>Macroderma gigas</i>)	Vulnerable (EPBC Act) Vulnerable (BC Act)	Ghost Bats are patchily distributed across most of northern Australia, however the recent contraction in the distribution in central Australia has left the Pilbara population of ghost bats isolated by extensive sandy deserts. They are generally associated with Gorge / Gully or drainage line habitats, requiring an undisturbed cave, deep fissure or disused mine shaft in which to roost. The Ghost Bat forages in areas of open woodland (Churchill, 2008).	This species may forage over parts of the Amendment Application Area sporadically as part of a larger home range. There are four caves within the Amendment Application Area that do not have Ghost Bat records, but have the potential to be night roosts. Disturbance in proximity to these caves will be minimised.	Possible	Low This species may forage over the habitats within the Amendment Application Area and surrounds. The Ghost Bat would not be dependant on the habitats present within the Amendment Application Area (given the known caves show no evidence of use) and are unlikely to be impacted from proposed activities.

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantius</i>)	Vulnerable (EPBC Act) Vulnerable (BC Act)	The Pilbara Leaf-nosed Bat requires deep caves or disused mine shafts in which to roost (van Dyck and Strahan, 2008), at least in the dry season. These bats have been recorded in isolated populations in the Pilbara, and are present only where suitable roosting niches are available. They are generally sparsely distributed. The Pilbara Leaf-nosed Bat forages in areas of open woodland (Churchill, 2008).	There are no caves suitable for roosting sites in the Amendment Application Area. This species may forage over parts of the Amendment Application Area sporadically as part of a larger home range.	Possible	Low This species may forage over the habitats within the Amendment Application Area and surrounds. No suitable roosting habitat has been identified within the Amendment Application Area and therefore the Pilbara Leaf-nosed Bat would not be dependant on the habitats present within the Amendment Application Area and are therefore unlikely to be impacted from proposed activities.
Western Pebble-mound mouse (<i>Pseudomys chapmani</i>)	Priority 4 (DBCAs)	The Western Pebble-mound Mouse is restricted to the Pilbara region, where it is recognised as an endemic species. Abandoned mounds to the east of its current range indicate a decline in distribution (Menkhorst and Knight, 2004). Abandoned mounds in disturbed areas suggest that the species is under threat by grazing and mining activities. The construction of extensive pebble mounds, built from small stones, which typically cover areas from 0.5-9.0 square metres, is characteristic of this species. Mounds are restricted to suitable class stones, and are usually found on gentle slopes and spurs (van Dyck and Strahan, 2008).	This species has been recorded from two locations within the Amendment Application Area. The Hillcrest / Hillslope habitat provides suitable habitat for this species.	Recorded	Low This species was recorded and it is likely to utilise the Hillcrest / Hillslope habitats within the Amendment Application Area. While the Hillcrest / Hillslope may be utilised by the Western Pebble-mound Mouse, the proposed area for clearing is small in a regional context and is contiguous with habitats in the local and regional area. Active Pebble-mouse mounds will be avoided using a 10 m buffer, where practicable.
Reptiles					
Pilbara Flat-headed Blind Snake (<i>Anilius ganei</i>)	Priority 1 (DBCAs)	The Pilbara Flat-headed Blind Snake is a moderately robust blind snake known from widely separated areas between Newman and Pannawonica. A very cryptic species. Most often recorded in rocky or stony areas and considered to be possibly associated with moist gorges and gullies (Wilson and Swan, 2010)	Limited records of this species make habitat relevance hard to assess however the Hillcrest / Hillslope and Floodplain habitats of the Amendment Application Area be suitable for this species, so it may disperse and forage across the Amendment Application Area.	Possible	Low It is possible that the grading of access tracks and transmission tower pads may result in a localised impact on this species' habitat. Any potential impact is likely to be moderated by the minimal disturbance associated with the clearing activities, and extensive undisturbed areas in the broader region. Given the regional distribution of Pilbara Flat-headed Blind Snake, the loss of some habitat from the proposed clearing associated with the Amendment Application Area is considered as being low when compared to the expansive areas of suitable habitat remaining and throughout in the Pilbara.

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Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
<p>Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</p>	<p>Vulnerable (EPBC Act) Vulnerable (BC Act)</p>	<p>The Pilbara Olive Python's range is restricted to the Pilbara region, north Western Australia and the Dampier Archipelago. Habitat consists of rocky escarpments, gorges and waterholes within the Pilbara Region. The preferred microhabitat for this species are under rock piles, wetlands and drainage lines, on top of rocks and under spinifex, as well as in artificial features such as overburden heaps, railway embankments and sewerage treatment ponds. The species' breeding season occurs from June to August, with males moving long distances in search of breeding females (Wilson and Swan, 2017).</p>	<p>This species may utilise the Drainage Area / Floodplain, Minor Drainage Line and Major Drainage Line habitats of the Amendment Application Area in a transitory nature when conditions are suitable.</p>	<p>Possible</p>	<p>Low The impact upon this species is likely to be low as there are larger areas of suitable rocky habitat and drainage line habitat in a similar or better condition adjacent to the Amendment Application Area and in the wider area.</p>
<p>Spotted <i>Ctenotus</i> (<i>Ctenotus uber</i> subsp. <i>johnstonei</i>)</p>	<p>Priority 2 DBCA</p>	<p>Little is known of this species and its taxonomic status is uncertain. Within the Pilbara, the taxon is known from <i>Triodia</i> on hillslopes, <i>Acacia xiphophylla</i> over chenopods, and <i>Acacia xiphophylla</i> scattered tall shrubs to high open shrubland (Cogger, 2014); a few localities on the western plains surrounding the Fortescue Marshes and from Mulga habitat (Biologic, 2013); and chenopod shrubland at a base of a sandstone hill (Wilson and Swan, 2008).</p>	<p>This species has been recorded in the broader area and may be a transient visitor to the Amendment Application Area.</p>	<p>Possible</p>	<p>Low The proposed activities are unlikely to have an impact on this species given its high mobility, the narrow nature of the Amendment Application Area and the presence of large areas of its preferred habitat in the surrounding areas which are in the same or better condition to that of the Amendment Application Area.</p>

3.5 GROUNDWATER

The Amendment Application Area is located in the Pilbara Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (DoW, 2009a).

There is one main aquifer within the Amendment Application Area, the Hamersley – Fractured Rock Aquifer which is described as: “The Precambrian rocks of the Hamersley Basin are principally volcanics, shales and iron formations. Groundwater is contained within fractures within these rocks. The groundwater level may be deep below the surface, and is generally fresh. The main use of this aquifer is for mining and mine dewatering from iron ore mines. Bores have also been drilled for road and railway construction. There will be increasing dewatering from the fractured rocks around iron ore mines as the pits become deeper (DoW, 2015)”.

3.6 SURFACE WATER

The Amendment Application Area is situated in the Pilbara Surface Water Area, proclaimed under the RIWI Act (DoW, 2009b).

Three named non-perennial water courses (Fortescue River, Homestead Creek and Shovelanna Creek) and numerous unnamed drainage lines intersect the Amendment Application Area.

Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.

4 ENVIRONMENTAL MANAGEMENT

The management of the environmental aspects of BHP’s operations at the Amendment Application Area are managed under the company’s AS/NZS ISO 14001:2004 certified Environmental Management System (EMS). The EMS describes the organisational structure, responsibilities, practices, processes and resources for implementing and maintaining environmental objectives at all BHP sites

Additionally, operational controls for environmental management for the Project area are guided by BHP’s Charter values. The Charter Values outline a commitment to develop, implement and maintain management systems for sustainable development that drive continual improvement and set and achieve targets that promote efficient use of resources. In order to give effect to the Charter Values, a series of Our Requirements Documents have been developed.

BHP has also developed a Sustainable Development Policy for its operations. The Sustainable Development Policy outlines a commitment to setting objective and targets to achieve sustainable outcomes and to continually improve our performance.

BHP also has an internal Project Environmental and Aboriginal Heritage Review (PEAHR) Procedure. The purpose of the procedure is to manage implementation of environmental, Aboriginal heritage, land tenure and legal commitments prior to and during land disturbance. All ground disturbance activities will meet the requirements of the PEAHR procedure, all relevant legislative and regulatory requirements, the BHP Charter, industry standards, and codes of practice.

All personnel carrying out works associated with clearing activities are required to comply with BHP’s Charter Values, BHP’s Our Requirements, and relevant legislative and licensing requirements.

5 PROJECT COMPLIANCE WITH THE TEN CLEARING PRINCIPLES

BHP considers that native vegetation clearing within the Amendment Application Area will not result in any significant environmental or social impacts, and complies with the Ten Clearing Principles, as defined in Schedule 5 of the EP Act. **Section 6** provides an assessment of project compliance with the Ten Clearing Principles.

6 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

The information used to assess the application against the Ten Clearing Principles has been based on the findings of multiple baseline surveys (**Section 3**).

6.1 PRINCIPLE A

Native vegetation should not be cleared if it comprises a high level of biological diversity

This proposal is not likely to be at variance to this Principle.

Similar habitat to the Amendment Application Area is located outside the Amendment Application Area. These other areas of similar vegetation type are therefore expected to have a similar biological diversity and conservation value than that of the Amendment Application Area.

The proposed clearing is therefore unlikely to have any significant impact on the biodiversity of the region.

Table 6 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle A.

Table 6 Assessment against Principle A components

Principle	Criteria	Assessment	Outcome
<p>a) Native vegetation should not be cleared if it comprises a high level of biological diversity.</p>	<p>a1) Native vegetation should not be cleared if it is representative of an area of outstanding biodiversity in the Bioregion.</p>	<p>The native vegetation within the Amendment Application Area is represented in the same condition within the broader region and is not considered to be of outstanding biodiversity in the Bioregion.</p>	<p>Not at variance with clearing principle.</p>
	<p>a2) Native vegetation should not be cleared if it has higher diversity of indigenous aquatic or terrestrial plant or fauna species than native vegetation of that ecological community in good or better condition in the Bioregion.</p>	<p>The native vegetation within the Amendment Application Area is in the same condition as other areas of similar vegetation type within the broader region.</p>	<p>Not at variance with clearing principle.</p>
	<p>a3) Native vegetation should not be cleared if it has higher diversity of indigenous aquatic or terrestrial plant or fauna species than the remaining vegetation of that ecological community in the local area.</p>	<p>The native vegetation within the Amendment Application Area is not considered to have higher biodiversity and conservation value than that of the surrounding vegetation within the local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>a4) Native vegetation should not be cleared if it has higher ecosystem diversity than other native vegetation of that local area.</p>	<p>The native vegetation within the Amendment Application Area is not considered to have a higher ecosystem diversity than other native vegetation of that local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>a5) Native vegetation should not be cleared if it has higher genetic diversity than the remaining native vegetation of that ecological community.</p>	<p>The native vegetation within the Amendment Application Area is not considered to have a higher genetic diversity than the remaining native vegetation of that ecological community as the vegetation is contiguous with adjacent native vegetation and has no special features.</p>	<p>Not at variance with clearing principle.</p>
	<p>A6) Native vegetation should not be cleared if it is necessary for the continued in situ existence of significant habitat for priority flora species published by the Department of Environment and Conservation.</p>	<p>No Priority flora species have been recorded in the Amendment Application Area. Should any Priority flora populations be identified they will be avoided using a 10 m buffer where practicable.</p>	<p>Not at variance with clearing principle.</p>

6.2 PRINCIPLE B

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia

This proposal is not likely to be at variance to this Principle.

There are six broad fauna habitat types within the Amendment Application Area (**Figures 4 and 5**).

The vegetation and habitat found within the Amendment Application Area are considered to be well represented in the Pilbara bioregions.

One fauna species of significance has been recorded from within the Amendment Application Area with an additional fifteen species considered to potentially occur within the Amendment Application Area (**Table 5**). As described in **Section 3.4.4** and **Table 5** clearing of the Amendment Application Area is expected to have a low impact on these species.

Table 7 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle B.

Table 7 Assessment against Principle B components

Principle	Criteria	Assessment	Outcome
<p>b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</p>	<p>b1) Native vegetation should not be cleared if it is or is likely to be habitat for fauna that is declared Specially Protected under the BC Act.</p>	<p>No BC Act protected species have been recorded from the Amendment Application and 12 BC Act protected species are considered 'possible' or 'likely' to occur within the Amendment Application Area (Table 5). The proposed activities are unlikely to have a significant impact on these species as:</p> <ul style="list-style-type: none"> • All species are wide-ranging and found throughout the broader region; • There are no key habitat features within the Amendment Application Area; • All species are only likely to be transient visitors within the Amendment Application Area; • These species do not exclusively depend on any habitat type or feature within the Amendment Application Area; and • Similar habitat is well represented outside the Amendment Application Area. 	<p>Not at variance with clearing principle.</p>
	<p>b2) Native vegetation should not be cleared if it is or is likely to be habitat for Priority Listed Fauna.</p>	<p>One Priority fauna species has been recorded within the Amendment Application Area and three Priority fauna species are considered 'possible' or 'likely' to occur within the Amendment Application Area. As detailed in Table 5 these species are unlikely to be impacted for the following reasons:</p> <ul style="list-style-type: none"> • The preferred habitat for these species is well represented outside the Amendment Application Area; • Similar habitat within close vicinity to the Amendment Application Area was found to be the same or better condition than that of the Amendment Application Area; and • Active mounds of the Western Pebble-mound Mouse will be avoided using a 10 m buffer, where practicable. 	<p>Not at variance with clearing principle.</p>
	<p>b3) Native vegetation should not be cleared if it is or is likely to be habitat for fauna that is otherwise significant.</p>	<p>Habitat found within the Amendment Application Area may be suitable for use by significant fauna, however similar habitat in the same or better condition is widespread adjacent the Amendment Application Area.</p>	<p>Not at variance with clearing principle.</p>
	<p>b4) Native vegetation should not be cleared if it provides significant habitat for fauna species in the local area.</p>	<p>Habitat within the Amendment Application Area is not considered significant habitat for fauna species within the local area. Similar habitat to that proposed to be cleared is located in the area surrounding the Amendment Application Area.</p>	<p>Not at variance with clearing principle.</p>
	<p>b5) Native vegetation should not be cleared if it maintains ecological functions and processes that protect significant habitat for fauna.</p>	<p>The clearing of native vegetation is not considered to alter ecological functions and processes that protect significant habitat for fauna.</p>	<p>Not at variance with clearing principle.</p>

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Principle	Criteria	Assessment	Outcome
	b6) Native vegetation should not be cleared if it forms, or is part of, an ecological linkage that is necessary for the maintenance of fauna.	No ecological linkages run through the Amendment Application Area that are necessary for the maintenance of fauna.	Not at variance with clearing principle.
	b7) Native vegetation should not be cleared if it provides significant habitat for fauna communities (assemblages) and meta-populations.	The Amendment Application Area is not considered to contain significant habitat for faunal assemblages that are not also present in other areas within the vicinity. The Amendment Application Area is not considered likely to contain geographically isolated fauna populations.	Not at variance with clearing principle.

6.3 PRINCIPLE C

Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora

This proposal is not likely to be at variance to this Principle.

No species listed under the EPBC Act or gazetted as Threatened under the BC Act were recorded in the Amendment Application Area. Three species listed as Priority Flora by the DBCA have been recorded in the Amendment Application Area (**Section 3.4.2**).

Table 8 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle C.

Table 8 Assessment against Principle C components

Principle	Criteria	Assessment	Outcome
c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	c1) Native vegetation should not be cleared if it is necessary for the continued <i>in situ</i> existence of populations of Declared Rare Flora under the <i>BC Act 2016</i>	No Threatened flora species were recorded in the Amendment Application Area.	Not at variance with clearing principle.
	c2) Native vegetation should not be cleared if it is necessary for the continued <i>in situ</i> existence of other significant flora.	No species listed under the EPBC Act or other significant flora species were recorded in the Amendment Application Area.	Not at variance with clearing principle.

6.4 PRINCIPLE D

Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community

This proposal is not likely to be at variance to this Principle.

None of the vegetation associations or landforms identified within the boundaries of CPS 6141/1 are associated with a TECs or PECs (Onshore Environmental, 2014). The closest PEC is more than 30 km north of the Amendment Application Area (**Section 3.4.1**). **Table 9** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle D.

Table 9 Assessment against Principle D components

Principle	Criteria	Assessment	Outcome
d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.	d1) Native vegetation should not be cleared if threatened ecological communities listed under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> are present.	No EPBC Act TECs are present in the Amendment Application Area.	Not at variance with clearing principle.
	d2) Native vegetation should not be cleared if it is necessary for the maintenance of Threatened Ecological Communities listed under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .	No EPBC Act TECs or associated native vegetation will be impacted by the proposed works.	Not at variance with clearing principle.
	d3) Native vegetation should not be cleared if other significant ecological communities are present.	No significant ecological communities are known to occur or are likely to occur within the Amendment Application Area.	Not at variance with clearing principle.
	d4) Native vegetation should not be cleared if it is necessary for the maintenance of other significant ecological communities.	No DBCA listed TECs or associated native vegetation will be impacted by the proposed works.	Not at variance with clearing principle.
	d5) Native vegetation should not be cleared if it is necessary for the continued <i>in situ</i> existence of significant examples of priority threatened ecological communities published by the Department of Environment and Conservation.	No DBCA listed PECs or associated native vegetation will be impacted by the proposed works.	Not at variance with clearing principle.

6.5 PRINCIPLE E

Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared

This proposal is not likely to be at variance to this Principle.

The habitat and vegetation within the Amendment Application Area is well represented in the Land Systems of the region (**Section 3.4.1**), and therefore it is unlikely individual species would be restricted to a particular habitat and vegetation occurring in the Amendment Application Area.

Table 10 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle E.

Table 10 Assessment against Principle E components

Principle	Criteria	Assessment	Outcome
<p>e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</p>	<p>e1) Native vegetation should not be cleared if the remaining native vegetation represents less than 30%, or the clearing would reduce the representation of remaining native vegetation to less than 30% in the Bioregion (or subregion where applicable).</p>	<p>Clearing native vegetation within the Amendment Application Area will not reduce the extent of native vegetation below 30% in the bioregion or subregion.</p>	<p>Not at variance with clearing principle.</p>
	<p>e2) Native vegetation should not be cleared if an ecological community represents less than 30% of its original extent or clearing would reduce the representation of any ecological community to less than 30% of its original extent in the Bioregion (or subregion where applicable).</p>	<p>Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the ecological community from pre-European extents. Current remaining extents of the vegetation communities in the bioregion are almost 100% of pre-European extents.</p>	<p>Not at variance with clearing principle.</p>
	<p>e3) Native vegetation should not be cleared if clearing would reduce an ecological community to less than 1% of the Bioregion (or subregion where applicable)</p>	<p>Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the vegetation community in the bioregion.</p>	<p>Not at variance with clearing principle.</p>
	<p>e4) Native vegetation should not be cleared if the remaining native vegetation represents less than 30% or the clearing would reduce the representation of remaining native vegetation to less than 30% in the Local Area.</p>	<p>Clearing native vegetation within the Amendment Application Area will not reduce the representation of remaining native vegetation to less than 30% in the local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>e5) Native vegetation should not be cleared if an ecological community represents less than 30% of its original extent or clearing will reduce the representation of any ecological community to less than 30% of its original extent in the Local Area.</p>	<p>Clearing native vegetation within the Amendment Application Area will not reduce the representation of any ecological community to less than 30% of its original extent in the local area.</p>	<p>Not at variance with clearing principle.</p>
	<p>e6) Native vegetation should not be cleared if clearing would reduce any ecological community to less than 1% of the Local Area.</p>	<p>Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the vegetation community in the local area.</p>	<p>Not at variance with clearing principle.</p>

6.6 PRINCIPLE F

Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland

This proposal is unlikely to be at variance to this Principle.

Three named non-perennial water courses (Fortescue River, Homestead Creek and Shovelanna Creek) and numerous unnamed drainage lines intersect the Amendment Application Area.

Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.

Table 11 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle F.

Table 11 Assessment against Principle F components

Principle	Criteria	Assessment	Outcome
<p>f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<p>f1) Native vegetation should not be cleared if it is growing in a watercourse or wetland that has been identified as having significant environmental values.</p>	<p>No permanent watercourses or wetlands are located within with the Amendment Application Area.</p> <p>Three named non-perennial water courses (Fortescue River, Homestead Creek and Shovelanna Creek) and numerous unnamed drainage lines intersect the Amendment Application Area.</p> <p>Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.</p>	<p>Not at variance with clearing principle.</p>
	<p>f2) Native vegetation should not be cleared if it provides a buffer area for watercourses and wetlands identified in criteria (f1) and (f2).</p>	<p>No permanent watercourses or wetlands are located within with the Amendment Application Area.</p> <p>Three named non-perennial water courses (Fortescue River, Homestead Creek and Shovelanna Creek) and numerous unnamed drainage lines intersect the Amendment Application Area.</p> <p>Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.</p>	<p>Not at variance with clearing principle.</p>
	<p>f3) Native vegetation should not be cleared if water tables are likely to change and adversely affect ecological communities that are wetland or groundwater dependent.</p>	<p>Due to the small scale linear nature of clearing this project is not considered likely to adversely alter water tables, and as such will not impact on any ecological communities that are wetland or groundwater dependent.</p>	<p>Not at variance with clearing principle.</p>
	<p>f4) Native vegetation should not be cleared if it is growing in other watercourses or wetlands.</p>	<p>No permanent watercourses or wetlands are located within the Amendment Application Area or in association with any other immediate watercourses or wetland in the surrounding area.</p>	<p>Not at variance with clearing principle.</p>

6.7 PRINCIPLE G

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation

This proposal is not likely to be at variance to this Principle.

Land degradation may include localised impacts such as erosion, changes to pH, water logging, salinisation or spread of weeds. These potential impacts are assessed in the sections below. **Table 12** provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle G.

Given the relatively small amount of clearing required for the project, the proposed management strategies for weed species within the Amendment Application Area and the low susceptibility of the soils to erosion, it is considered that the project will not be at variance to Principle G.

6.7.1 Erosion

It is not anticipated that the removal of vegetation will contribute to increased amounts of wind or water erosion in the Amendment Application Area or adjacent areas.

6.7.2 Changes to pH

The Amendment Application Area is not in an area at risk of acid sulphate soils and there are no recorded acid sulphate soils within the Amendment Application Area. It is not expected that the proposed clearing will result in changes to soil pH.

6.7.3 Water logging and salinisation

It is not expected that there will be a significant reduction in groundwater uptake due to the proposed clearing. No water logging or increased salinisation is expected to occur as a result of the proposed clearing.

6.7.4 Weeds

Fifteen introduced flora species have been recorded in the Amendment Application Area (**Table 4**). None are listed as a Declared Pest under the BAM Act. These are typical introduced species commonly recorded in the Pilbara region.

Control of established weed populations will be carried out according to the *BHP Weed Control and Management Procedure*.

Table 12 Assessment against Principle G components

Principle	Criteria	Assessment	Outcome
g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	g1) Native vegetation should not be cleared if wind or water erosion of soil is likely to be increased (on or off site).	Soil erosion is not anticipated to occur as any areas cleared will be revegetated where practicable, if not required for infrastructure.	Not considered to be at variance with clearing principle.
	g2) Native vegetation on land with soils with high or low pH should not be cleared.	The Amendment Application Area is not considered to contain soils at risk of having acid sulphate soils present. No vegetation on soils with significantly low (or high) pH will be impacted by the proposed works.	Not at variance with clearing principle.
	g3) Native vegetation should not be cleared if water logging is likely to be increased (on or off site).	It is not expected that water logging would be increased by the clearing of native vegetation within the Amendment Application Area.	Not at variance with clearing principle.
	g4) Native vegetation should not be cleared if land salinisation is likely to be increased (on or off site).	Soil salinity is not considered to be increased in the Amendment Application Area (on or off site) by the clearing of native vegetation.	Not at variance with clearing principle.

6.8 PRINCIPLE H

Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area

This proposal is not likely to be at variance to this Principle.

The Amendment Application Area is not within any conservation areas as listed by the DBCA or those protected under the EPBC Act. The closest conservation area is Karijini National Park which is more than 115 km west northwest of the Amendment Application Area.

The Amendment Application Area is not considered to form an ecological linkage to these conservation areas.

An assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle H is provided in **Table 13** below.

Table 13 Assessment against Principle H components

Principle	Criteria	Assessment	Outcome
h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	h1) Native vegetation should not be cleared if it contributes significantly to the environmental values of a conservation area.	The vegetation of the Amendment Application Area does not contribute to the environmental values of a conservation area.	Not at variance with clearing principle.
	h2) Native vegetation should not be cleared if that vegetation provides a buffer to a conservation area.	There are no conservation areas within the vicinity of the Amendment Application Area.	Not at variance with clearing principle.
	h3) Native vegetation should not be cleared if the land contributes to an ecological linkage to a conservation area.	The nearest conservation area is 65 km north of the Amendment Application Area.	Not at variance with clearing principle.
	h4) Native vegetation should not be cleared if it provides habitats not well represented on conservation land.	There are no habitats within the Amendment Application Area that are not well represented on conservation land.	Not at variance with clearing principle.

6.9 PRINCIPLE I

Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water

This proposal is not likely to be at variance to this Principle.

Appropriate surface water management practices will be implemented to minimise erosion and minimise potential impacts on the quality of surface water. The clearing is unlikely to cause deterioration in the quality of any surface or underground water.

Where practicable, existing cleared tracks will be used to cross the unnamed non-perennial minor drainage line. If it is necessary for new crossings to be installed, clearing will be kept to a bare minimum and will be constructed flat level to the surface (i.e. a simple clearing with no bunds) to maintain the natural surface flow.

Table 14 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle I.

Table 14 Assessment against Principle I components

Principle	Criteria	Assessment	Outcome
i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	i1) Native vegetation should not be cleared if clearing the vegetation will reduce the quality of surface or underground water in proclaimed, gazetted or declared areas or catchments.	The clearing of native vegetation is not considered likely to alter the quality of surface or ground water within the Amendment Application Area due to the limited nature of the clearing within the Amendment Application Area.	Not at variance with clearing principle.
	i2) Native vegetation should not be cleared if sedimentation, erosion, turbidity or eutrophication of water bodies on or off site is likely to be caused or increased.	Localised erosion will not impact any waterbodies as clearing will be restricted to a bare minimum near surface water features and cleared areas that are no longer required will be revegetated.	Not at variance with clearing principle.
	i3) Native vegetation should not be cleared if water tables are likely to change significantly altering salinity or pH.	The clearing of native vegetation is not considered likely to alter the quality of surface or ground water within the Amendment Application Area.	Not at variance with clearing principle.
	i4) Native vegetation should not be cleared if the clearing is likely to alter the water regimes of groundwater-dependent ecosystems on or off site, causing degradation to the biological communities associated with these systems.	The clearing of native vegetation is not considered likely to alter the regimes of surface or groundwater dependent vegetation within the vicinity of the Amendment Application Area.	Not at variance with clearing principle.

6.10 PRINCIPLE J

Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding

This proposal is not likely to be at variance to this Principle.

Massive surface water runoff and localised flooding occurs following intense rainfall events during December to April. However, the incidence or intensity of flooding is not likely to be significantly influenced by the proposed vegetation clearing. It is highly improbable that surface runoff generated from the cleared area could create sufficient concentrated water volumes to cause even a localised flood event. Drainage infrastructure will be designed to ensure that post-construction flows will not differ significantly from pre-construction flows. Therefore the proposed clearing is unlikely to cause or exacerbate the incidence or intensity of flooding.

Table 15 provides an assessment of the proposed clearing activities within the Amendment Application Area against the components of clearing Principle J.

Table 15 Assessment against Principle J components

Principle	Criteria	Assessment	Outcome
j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.	j1) Native vegetation should not be cleared if it is likely to lead to an incremental increase in peak flood height.	The clearing of native vegetation is not considered likely to cause any alteration to peak flood height.	Not at variance with clearing principle.
	j2) Native vegetation should not be cleared if it is likely to lead to an incremental increase in duration of flood peak.	The clearing of native vegetation is not considered likely to cause any impact on duration of flood peak.	Not at variance with clearing principle.

7 HERITAGE

The Land Access Unit is the internal group within BHP that manages Aboriginal heritage matters. The Land Access Unit is responsible for ensuring that BHP complies with the *Aboriginal Heritage Act, 1972*, and all other state and federal heritage legislation. All land disturbance activities are subject to ethnographic and archaeological surveys as part of an internal PEHR. The PEHR process ensures that all heritage sites in the vicinity of the Project Area are identified and avoided where practicable.

The Amendment Application Area is located within the Kyiyaparli Native Title Claim (WC2005/006). Ethnographic and archaeological surveys of the Application Area have been conducted in consultation with the Nyiyaparli and Ngarlawangga people. A number of heritage sites were identified within the Amendment Application Area (site details are not provided here out of respect of the wishes of the Traditional Owners).

If any heritage site cannot practicably be avoided, BHP Iron Ore would consult the relevant traditional owners and seek approval under the *Aboriginal Heritage Act, 1972* before the site is disturbed.

8 CONCLUSION

The proposed clearing in the Amendment Application Area is unlikely to be at variance to any of the Ten Clearing Principles. CPS 3445/4 authorises the clearing of up to 260.33 ha. To date BHP has cleared 52.28 ha and the clearing of the remaining 208.05 ha within an Amendment Application Area of 704.48 ha is unlikely to have any significant negative impacts on biodiversity and environmental values in the area.

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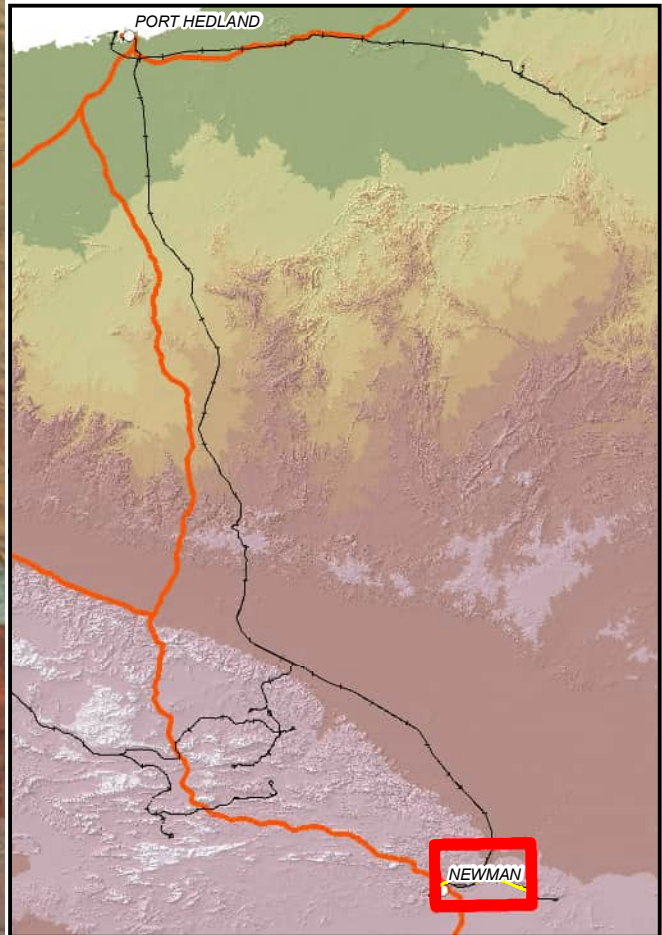
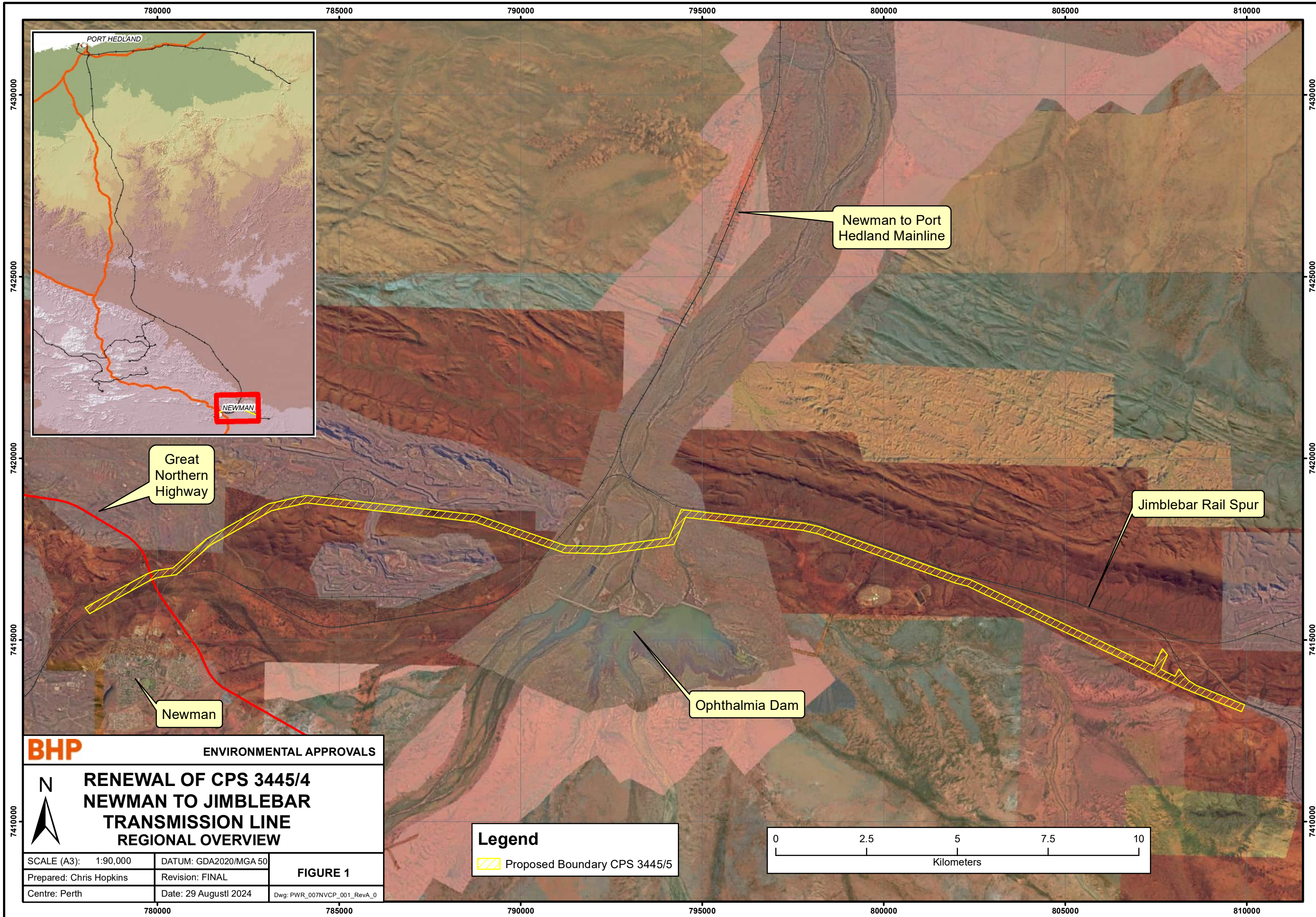
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Figures



Great Northern Highway

Newman

Newman to Port Hedland Mainline

Jimblebar Rail Spur

Ophthalmia Dam

BHP

ENVIRONMENTAL APPROVALS



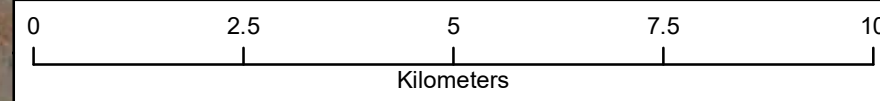
**RENEWAL OF CPS 3445/4
NEWMAN TO JIMBLEBAR
TRANSMISSION LINE
REGIONAL OVERVIEW**

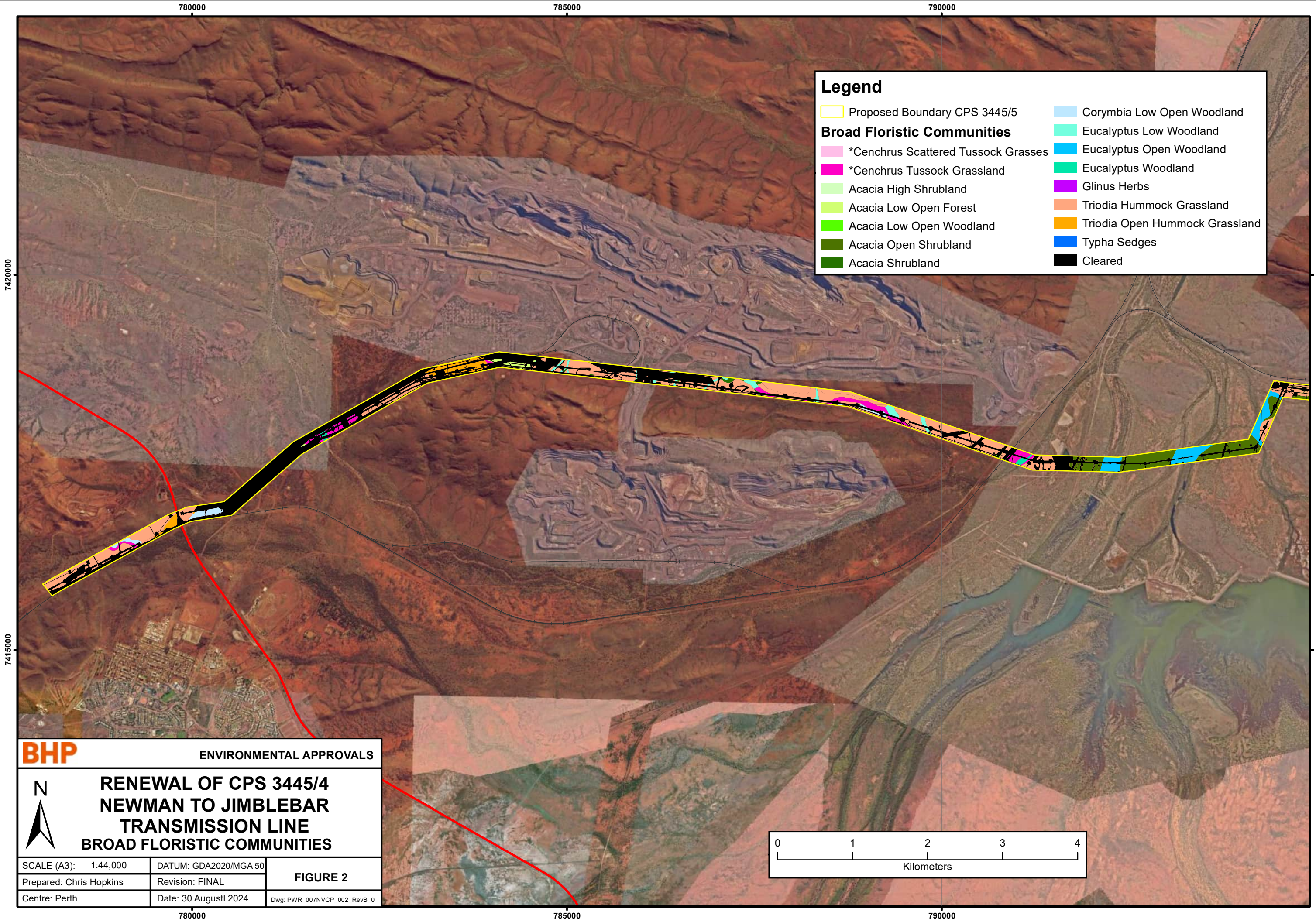
SCALE (A3): 1:90,000	DATUM: GDA2020/MGA 50	FIGURE 1
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 29 August 2024	

Dwg: PWR_007NVCP_001_RevA_0

Legend

Proposed Boundary CPS 3445/5





Legend

Proposed Boundary CPS 3445/5	Corymbia Low Open Woodland
Broad Floristic Communities	Eucalyptus Low Woodland
*Cenchrus Scattered Tussock Grasses	Eucalyptus Open Woodland
*Cenchrus Tussock Grassland	Eucalyptus Woodland
Acacia High Shrubland	Glinus Herbs
Acacia Low Open Forest	Triodia Hummock Grassland
Acacia Low Open Woodland	Triodia Open Hummock Grassland
Acacia Open Shrubland	Typha Sedges
Acacia Shrubland	Cleared

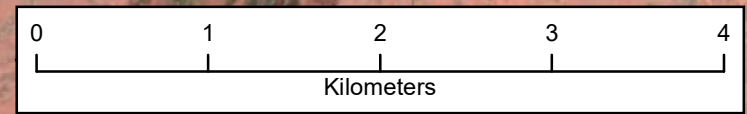
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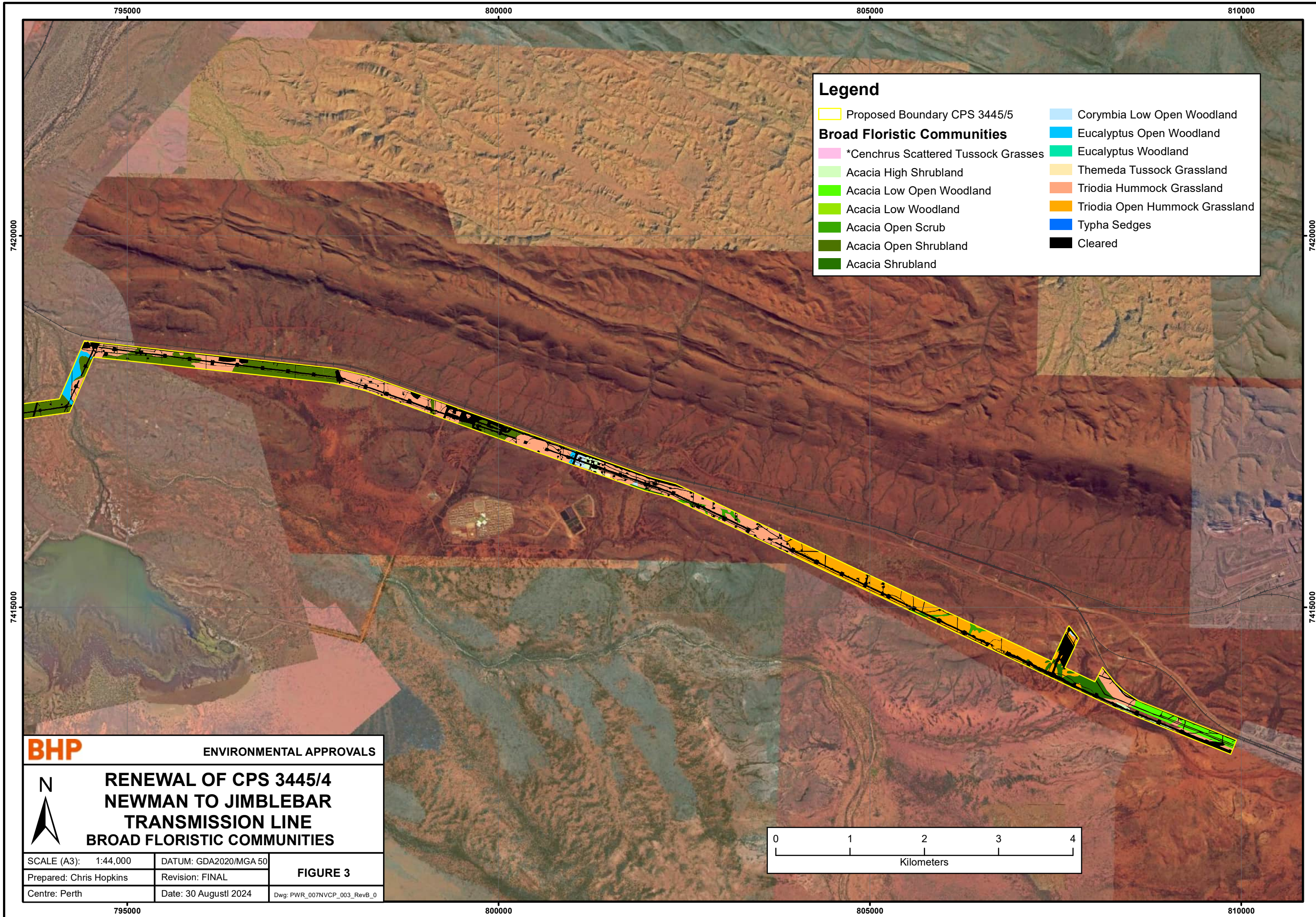
**RENEWAL OF CPS 3445/4
NEWMAN TO JIMBLEBAR
TRANSMISSION LINE
BROAD FLORISTIC COMMUNITIES**

SCALE (A3): 1:44,000 DATUM: GDA2020/MGA 50 **FIGURE 2**

Prepared: Chris Hopkins Revision: FINAL

Centre: Perth Date: 30 August 2024 Dwg: PWR_007NVCP_002_RevB_0





Legend

Proposed Boundary CPS 3445/5	Corymbia Low Open Woodland
Broad Floristic Communities	Eucalyptus Open Woodland
*Cenchrus Scattered Tussock Grasses	Eucalyptus Woodland
Acacia High Shrubland	Themeda Tussock Grassland
Acacia Low Open Woodland	Triodia Hummock Grassland
Acacia Low Woodland	Triodia Open Hummock Grassland
Acacia Open Scrub	Typha Sedges
Acacia Open Shrubland	Cleared
Acacia Shrubland	

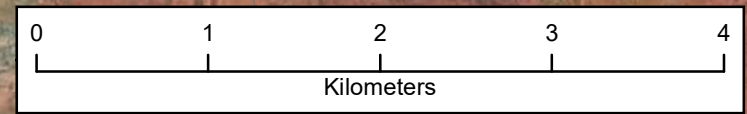
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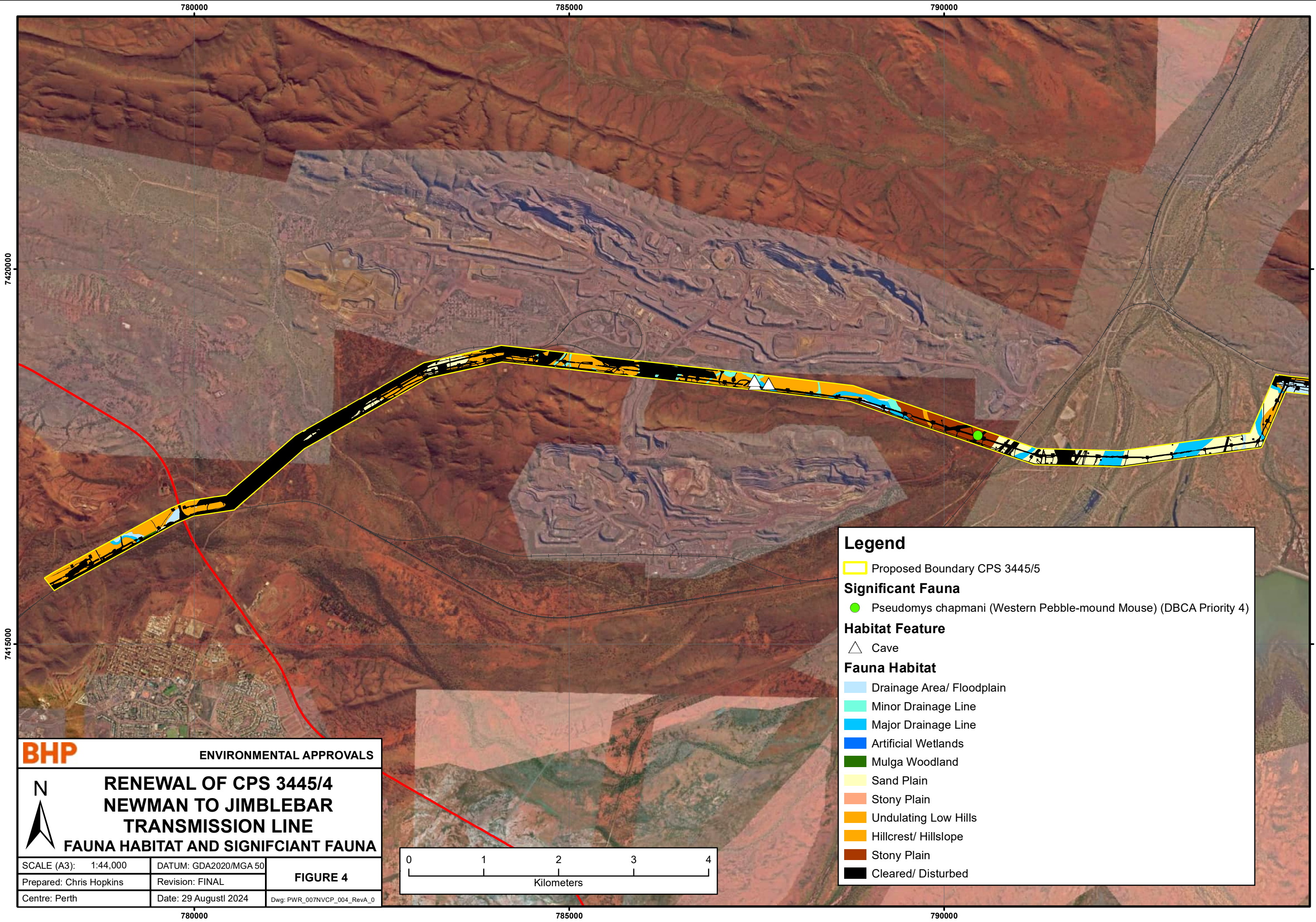
**RENEWAL OF CPS 3445/4
NEWMAN TO JIMBLEBAR
TRANSMISSION LINE
BROAD FLORISTIC COMMUNITIES**

SCALE (A3): 1:44,000 DATUM: GDA2020/MGA 50 **FIGURE 3**

Prepared: Chris Hopkins Revision: FINAL

Centre: Perth Date: 30 August 2024 Dwg: PWR_007NVCP_003_RevB_0





Legend

- Proposed Boundary CPS 3445/5
- Significant Fauna**
- Pseudomys chapmani (Western Pebble-mound Mouse) (DBCA Priority 4)
- Habitat Feature**
- Cave
- Fauna Habitat**
- Drainage Area/ Floodplain
- Minor Drainage Line
- Major Drainage Line
- Artificial Wetlands
- Mulga Woodland
- Sand Plain
- Stony Plain
- Undulating Low Hills
- Hillcrest/ Hillslope
- Stony Plain
- Cleared/ Disturbed

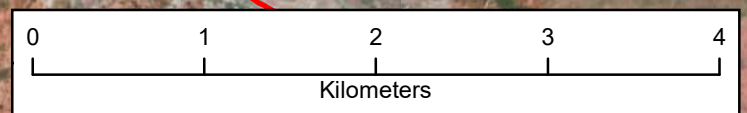
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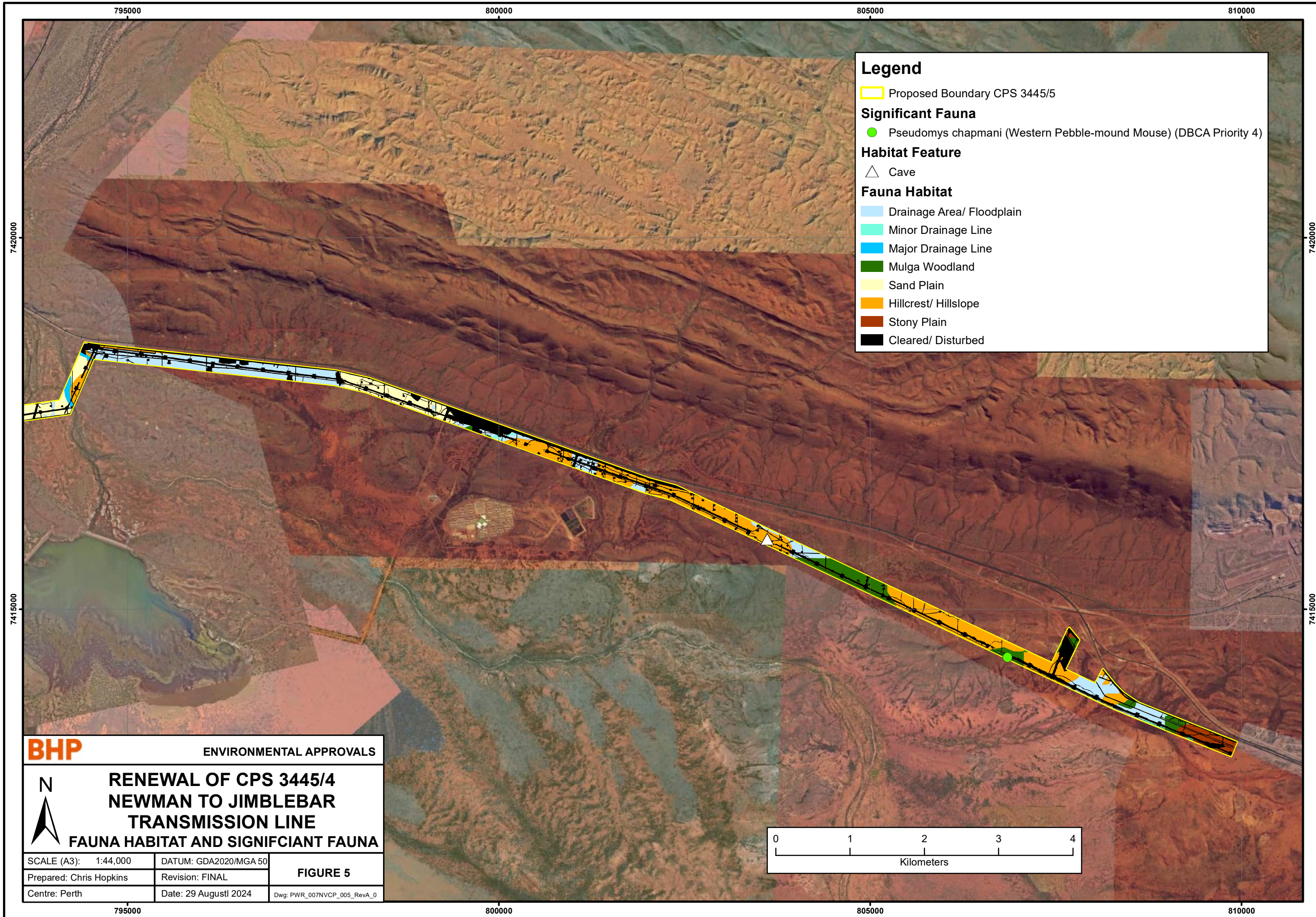
**RENEWAL OF CPS 3445/4
NEWMAN TO JIMBLEBAR
TRANSMISSION LINE
FAUNA HABITAT AND SIGNIFICANT FAUNA**

SCALE (A3): 1:44,000 DATUM: GDA2020/MGA 50 **FIGURE 4**

Prepared: Chris Hopkins Revision: FINAL

Centre: Perth Date: 29 August 2024 Dwg: PWR_007NVCP_004_RevA_0





Legend

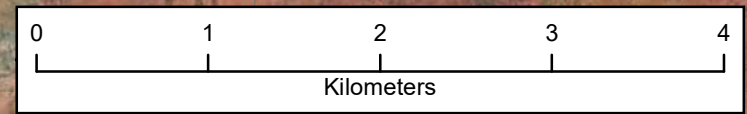
- Proposed Boundary CPS 3445/5
- Significant Fauna**
- Pseudomys chapmani (Western Pebble-mound Mouse) (DBCA Priority 4)
- Habitat Feature**
- Cave
- Fauna Habitat**
- Drainage Area/ Floodplain
- Minor Drainage Line
- Major Drainage Line
- Mulga Woodland
- Sand Plain
- Hillcrest/ Hillslope
- Stony Plain
- Cleared/ Disturbed

BHP ENVIRONMENTAL APPROVALS

**RENEWAL OF CPS 3445/4
NEWMAN TO JIMBLEBAR
TRANSMISSION LINE
FAUNA HABITAT AND SIGNIFICANT FAUNA**

SCALE (A3): 1:44,000	DATUM: GDA2020/MGA 50	FIGURE 5
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 29 August 2024	

Dwg: PWR_007NVCP_005_RevA_0



Appendices

**Appendix 1: Consolidation of Regional Vegetation Mapping BHP Billiton Iron Ore
Pilbara Tenure (Onshore Environmental, 2014)**

Appendix 2: East Ophthalmia & Ninga Detailed Flora & Vegetation Survey (Spectrum Ecology and Spatial, 2022)

**Appendix 3: Newman to Jimblebar Transmission Line and Newman Town Substation
Flora and Vegetation Assessment (ENV, 2009a)**

**Appendix 4: BHP WAIO Jimblebar *Eremophila capricornica* Targeted Flora Survey
(Biologic, 2021)**

**Appendix 5: Targeted Survey for Acacia sp. East Fortescue (surrounding OB31)
(Onshore, 2015)**

Appendix 6: Consolidated Fauna Habitat Mapping 2017 (Biologic Environmental Survey, 2017)

Appendix 7: East Ophthalmia and Ninga Detailed Vertebrate Fauna Survey (Biologic, 2022)

Appendix 8: Jimblebar targeted ghost bat survey (GHD, 2020)

**Appendix 9: Newman to Jimblebar Transmission Line and Newman Town Substation
terrestrial Fauna Assessment (ENV, 2009b)**