Application to Amend NVCP CPS 5572/2 Mount Goldsworthy

Native Vegetation Clearing Permit Amendment Application Supporting Document

April 2025

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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 Flank 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.

The Mount Goldsworthy Legacy Operations are located approximately 90 km east of Port Hedland. This site has not been in operation since 1982. BHP has identified the need to undertake a number of Closure activities at the legacy operations, as well as geotechnical, hydrological, contaminated sites and rehabilitation activities in the broader tenement.

Disturbance of approximately 770 ha associated with the mining operations (pits, overburden storage areas [OSAs], tracks, rail, powerline) occurred prior to the *Environmental Protection Act 1986* and were conducted under a State Agreement Proposal.

There are currently two Native Vegetation Clearing Permits (NVCPs) over the area:

- CPS 5045/2: Clearing of up to 42 ha for the purposes of abandonment bund construction; drilling related to ongoing monitoring, remediation activities and drainage control; and supporting infrastructure
- CPS 5572/2: Clearing of up to 110 ha for the purposes of borrow pits, exploration, hydrogeological and geotechnical investigations, infrastructure maintenance and associated activities.

A review of the area has identified an opportunity to merge CPS 5045/2 into CPS 5572/2. BHP is therefore seeking to amendment CPS 5572/2 to

- Amalgamate the boundaries of CPS 5045/2 and CPS 5572/2 so that all existing BHP tenure (excluding areas of significant habitat) at the Goldsworthy Mining Operations is covered by a single permit (**Figure 1**);
- Amend the purpose to “Clearing for the purposes of Closure activities, borrow pits, exploration, hydrogeological and geotechnical investigations, infrastructure maintenance and associated activities.”
- Extend the permit duration to 30 November 2035;
- Extend 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.

No other changes to the permit are required.

The full Closure works will be the subject of a new NVCP or further amendment to CPS 5572/2 to be submitted at a future date.

In accordance with Part V Division 2 of the *Environmental Protection Act 1986* (EP Act), BHP hereby refers the application to amend NVCP CPS 5572/2 to the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS).

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 *Environmental Protection Act 1986* (EP Act).

1.1 LOCATION

The Amendment Application Area is located approximately 90 km east of Port Hedland in the Pilbara region of Western Australia (**Figure 1**).

1.2 TENURE

The Amendment Application Area is located on

- Mineral Lease 235SA
- Mineral Lease 249SA
- General Purpose Lease 45/278

1.3 LOCAL GOVERNMENT JURISDICTION

The Amendment Application Area is located within the Town of Port Hedland and the Shire of East Pilbara.

1.4 PROPONENT

This Licence Amendment application has been submitted by BHP on behalf of the owners being the Mt Goldsworthy Joint Venture:

- BHP Iron Ore (Jimblebar) Pty Ltd 85%
- Itochu Minerals and Energy Australia Pty Ltd 8%
- Mitsui Iron Ore Corporation 7%

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 Closure activities, borrow pits, exploration, hydrogeological and geotechnical investigations, infrastructure maintenance and associated activities.

1.6 NVCP RECORDS

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 under CPS 5045 commenced in 2012 with a total of 4.7 ha cleared to the end of FY24 (BHP, 2024. None of these areas have bee rehabilitated to date as they are still required for the purpose for which they were cleared.

Clearing under CPS 5572 commenced in 2013 with a total of 1.72 ha cleared and 0.28 ha rehabilitated to the end of FY24 (BHP, 2024). The remaining locations cleared are still required for the purpose for which they were cleared.

Clearing has been minimised by restricting activities to the minimum required for safety and equipment access. Populations of significant flora 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.

1.7 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	DEMIRS
Permit Title	Goldsworthy Mining Operations

Permit Number	5572/3
Area to be cleared	110 ha.
Amendment Application Area	6,816.68 hectares
Purpose of the permit	Clearing for the purposes of Closure activities, borrow pits, exploration, hydrogeological and geotechnical investigations, infrastructure maintenance and associated activities.
Tenure	Mineral Lease 235SA Mineral Lease 249SA General Purpose Lease G45/278
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: • YAR_007NVCP_001_RevA_0 • YAR_007NVCP_002_RevA_0 • YAR_007NVCP_003_RevA_0 • YAR_007NVCP_004_RevA_0 BHP Shapefile D2 Reference: https://waio-dctm.bhp.com/D2/?docbase=bhpbio_od_prod&locateId=0b03c41a84c5274a&application=ManagedDocuments

Application Commitments	Section
Should any population of Threatened Flora be identified they will be avoided with a 50m buffer unless they are within previously disturbed areas and areas identified for Closure activities. A Permit to Take will be obtained in Threatened Flora are required to be disturbed.	3.4.2 6.3
Should any population of Priority listed flora be identified they will be avoided where practicable with a 10 m buffer. If Priority flora are identified within required Closure activity areas they may need to be cleared.	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
If any active Brush-tailed Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable.	3.4.4 6.2
If any active Greater Bilby burrows are identified they will be avoided using a 10 m buffer, where practicable.	3.4.4 6.2
If any active Western Pebble-mound Mouse mounds are identified they 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

2 ASSOCIATED APPROVALS

Any other additional approvals will be sought as required.

3 EXISTING ENVIRONMENT

3.1 CLIMATE

Port Hedland Airport (meteorological site 004032) is the closest Bureau of Meteorology (BoM) station to the Amendment Application Area. Average annual rainfall at Port Hedland Airport is 314.1 mm with a dry season (mean monthly rainfall <5 mm) between August and November and a wet season (mean monthly rainfall between 54.2 mm and 88.3 mm) between January and March (BoM, 2024a). The highest and lowest annual rainfall recorded for Port Hedland was 713.2 mm (recorded in 2013) and 44.5 mm (recorded in 1944), respectively (BoM, 2024a). The highest ever recorded daily rainfall for Port Hedland was recorded on 27 January 1967 with 387.1 mm (BoM, 2024a) which is 68.6 mm over the current mean annual rainfall for Port Hedland. The mean maximum temperatures in summer months (October to April) is 35.1°C to 36.8°C, and mean maximum temperatures in winter (May to September) are between 27.4°C and 32.5°C at Port Hedland Airport (BoM, 2024a).

Wittenoom meteorological site (005026) is the closest station to the Amendment Application Area that records daily evaporation. Wittenoom is located approximately 120 km northwest 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:

- Chichester subregion described as: “Northern section of the Pilbara Craton. Undulating Archaean granite and basalt plains include significant areas of basaltic ranges. Plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* (formerly *Triodia pungens*) hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on ranges. The climate is semi-desert-tropical and receives 300 mm of rainfall annually. Drainage occurs to the north via numerous rivers (e.g. De Grey, Oakover, Nullagine, Shaw, Yule, Sherlock).” (Kendrick and McKenzie, 2001).
- Roebourne subregion described as: “Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of Acacia stellaticeps or A. pyrifolia and A. *inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, Sporobolus and Mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three. Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually.” (Kendrick and Stanley, 2001).

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

Billygoat: “Highly dissected plains and slopes on ironstone gravels and colluvium and broad lower drainage floors, relief up to 20 m.”

Boolgeeda: “Stony lower slopes, level stony plains and narrow sub-parallel drainage floors, relief up to 20 m. A common system in shallow valleys below hill systems such as Newman and Rocklea.”

Capricorn: “Prominent strike ridges and ranges (relief up to 180 m) of sandstone and other sedimentary rocks with steep slopes and skeletal soils.”

Horseflat: “Extensive level plains with clay soils and Gilgai microrelief, also stony plains and very gently inclined slopes marginal to major rivers, both with non-gilgaied clay soils.”

Nita: “Level, red sandplains and occasional dunes. The fifth largest land system (6.2%) in the survey area; occurring only in the north-east.”

Paradise: “Flood plains with duplex soils (sometimes weakly saline) and clays.”

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 soil types occur within the Amendment Application Area (CSIRO, 2021):

My54: "Broad very gently undulating plains with scattered rock outcrops occurring as mesas: chief soils are neutral and acid red earths (Gn2.12, Gn2.11), with some hard red soils occurring on pediments of unit Oc61."

Oc40: "Alluvial plains, which are frequently badly surface eroded, and levees associated with prior streams: chief soils are hard alkaline red soils together with various sandy alkaline red soils. There are small areas of sandy soils on levees and prior stream channels, small areas of red dune soils, and some sandy red earths. In places erosion has removed the sandy surfaces and the resulting clay pans have sandy clay soils."

Oc61: "Dissected pediments and steep residual hills with iron formations: chief soils are hard alkaline red soils. Associated are various (Um) and (Uc) soils on the residual hills."

3.4 FLORA, VEGETATION AND FAUNA

A total of four flora and vegetation surveys have previously been completed within and adjacent to the proposed Amendment Application Area. The key flora and vegetation surveys relevant to this application are:

- *Flora and Vegetation Survey – Goldsworthy* (Onshore, 2013) (**Appendix 1**);
- *Flora and Vegetation Survey of the Goldsworthy Minesite* (Pilbara Flora, 2008) (**Appendix 2**);

Level 2 Flora and Vegetation surveys have been scheduled to be undertaken over the Amendment Application Area in April 2025. The reports for this survey should be available in October 2025 and will be uploaded to IBSA and provided to DEMIRS as soon as it is finalised.

Given the clearing period of CPS 5047/2 and CPS 5572/2 will expire 30 November 2025 BHP is seeking to amend the permit at this time to ensure that there is no gap in clearing approvals which would prevent ongoing work programs.

In the event that this upcoming survey identifies any:

- Threatened Flora: They will be avoided with a 50m buffer unless they are within previously disturbed areas and areas identified for Closure activities. A Permit to Take will be obtained in Threatened Flora are required to be disturbed.
- Priority listed flora: They will be avoided where practicable with a 10 m buffer. If Priority flora are identified within required Closure activity areas they may need to be cleared.

One vertebrate fauna survey has been completed within and adjacent to the Amendment Application Area:

- *Goldsworthy fauna assessment* (Biologic, 2013) (**Appendix 3**).

A targeted survey for Matters of National Environmental Significance has been scheduled to be undertaken over the Amendment Application Area in April 2025. This report for this survey should be available in October 2025 and will be uploaded to IBSA and provided to DEMIRS as soon as it is finalised

In the event that this upcoming survey identifies any:

- Significant Bat Caves: They will be avoided with a minimum of a 100m buffer, unless they are within previously disturbed areas and areas identified for Closure activities. Suitable measures will be undertaken to ensure that any Closure works within 100m of a cave will not impact of a bat population..
- Waterholes: They will be avoided with a 10m buffer where practicable. If waterholes are identified within required Closure activity areas disturbance could occur within 10 m.
- Greater Bilby: In the event active Greater Bilby burrows are identified they will be avoided using a 10 m buffer, where practicable. If active burrows are identified within required Closure activity areas they may need to be disturbed. Active burrow will be cleared of fauna prior to disturbance.

- Northern Quoll: In the event active Northern Quoll habitats are identified they will be avoided using a 10 m buffer, where practicable. If active habitat is identified within required Closure activity area it may need to be disturbed. Active habitat features will be cleared of fauna prior to disturbance.
- Brush-tailed Mulgara: In the event active Brush-tailed Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable. If active burrows are identified within required Closure activity areas they may need to be disturbed. Active burrow will be cleared of fauna prior to disturbance.
- Western Pebble-mound Mouse: In the event active Western Pebble-mound Mouse mounds are identified they will be avoided using a 10 m buffer, where practicable.

3.4.1 Vegetation Communities

The Amendment Application Area is located within the Interim Biogeographic Regionalisation for Australia (IBRA) Pilbara (Department of Environment and Heritage, 2005). According to the Government of Western Australia (2013), this bioregion is more than 99% vegetated (**Table 2**). The vegetation within the Amendment Application Area is classified as the following vegetation associations, as mapped by Beard (1975):

93 Hummock Grasslands, shrub steppe; kanji over soft spinifex
117 Hummock grasslands, grass steppe; soft spinifex
175 Short bunch grassland – savanna/grass plain (Pilbara)

There is more than 98% 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 (Government of Western Australia, 2013)

Vegetation Association	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	6.36
Vegetation association 93 within Western Australia	3,044,293	3,040,639	99.88	0.44
Vegetation association 93 within the Pilbara IBRA	3,042,114	3,038,471	99.88	0.44
Vegetation association 117 within Western Australia	897,107	883,703	98.51	13.87
Vegetation association 117 within the Pilbara IBRA	82,705	78,096	94.43	20.04
Vegetation association175 within Western Australia	525,952	524,484	99.72	4.22
Vegetation association 175 within the Pilbara IBRA	507,860	507,466	99.92	4.37

Onshore (2013) identified a total of 13 broad floristic communities (including disturbance areas) with 31 vegetation associations within the Application Area (**Table 3, Figure 2**). None of the vegetation associations or landforms identified within the boundary of the Amendment Application Area are associated with a TEC or PEC (Onshore Environmental, 2013). The closest PEC is more than 24 km north (Eighty Mile Land System) and more than 35 km east (Gregory Land System).

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 completely degraded.

Table 3 Vegetation associations of the Amendment Application Area (Onshore, 2013)

Broad Floristic Formation	Vegetation Association (Onshore, 2013)	
Terminalia Low Woodland	1	Low Woodland of *Terminalia canescens* and *Atalaya hemiglauca* over Open Hummock Grassland of *Triodia epactia* with High Open Shrubland of *Ehretia saligna*, *Ficus brachypoda* and *Acacia acradenia* in brown sandy loam on cliff lines and steep gullies
Acacia Closed Scrub	2	Closed Scrub of *Acacia monticola*, *Acacia acradenia* and *Grevillea wickhamii* over Hummock Grassland of *Triodia epactia* with Low Open Mallee of *Eucalyptus odontocarpa* in brown sandy loam along minor drainage lines dissecting undulating hills
Acacia Open Scrub	3a	Open Scrub of *Acacia ancistrocarpa*, *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* over Hummock Grassland of *Triodia schinzii* with Open Tussock Grassland of *Paraneurachne muelleri*, *Aristida holathera* and *Eragrostis eriopoda* in red loamy sand on sandplains
	3b	Open Scrub of *Acacia tumida* var. *pilbarensis* over Hummock Grassland of *Triodia epactia* with Low Open Woodland of *Corymbia hamersleyana* and *Corymbia flavescens* in red brown sand on pindan sandplains and sandy drainage zones
Grevillea Open Scrub	4	Open Scrub of *Grevillea wickhamii* over Scattered Hummock Grasses of *Triodia epactia* in variable mine overburden on rehabilitated post-mining infrastructure areas
Acacia Low Open Heath	5	Low Open Heath of *Acacia stellaticeps* over Open Hummock Grassland of *Triodia epactia* and *Triodia schinzii* with High Open Shrubland of *Grevillea wickhamii*, *Acacia ancistrocarpa* and *Hakea macrocarpa* in red orange sand on stony sandplains
Triodia Hummock Grassland	6a	Hummock Grassland of *Triodia epactia* with High Open Shrubland of *Grevillea wickhamii*, *Acacia inaequilatera* and *Petalostylis labicheoides* over Open Shrubland of *Acacia acradenia* in orange silty loam on sandstone hill crests and slopes
	6b	Hummock Grassland of *Triodia wiseana* with Low Open Shrubland of *Tephrosia rosea* var. *clementii* and *Corchorus parviflorus* with Scattered High Shrubs of *Grevillea wickhamii* and *Acacia inaequilatera* in brown sandy loam on dolerite rises, low hills and footslopes
	6c	Hummock Grassland of *Triodia epactia* with Scattered High Shrubs of *Acacia inaequilatera*, *Grevillea wickhamii* and *Acacia acradenia* over Scattered Low Shrubs of *Corchorus parviflorus* in orange silty loam on footslopes of sandstone hills
	6d	Hummock Grassland of *Triodia epactia* and *Triodia wiseana* with Low Mallee of *Eucalyptus odontocarpa* over Scattered High Shrubs of *Acacia acradenia*, *Grevillea wickhamii* and *Acacia inaequilatera* in brown sandy loam on steep sandstone hill slopes
	6e	Hummock Grassland of *Triodia epactia* with Scattered High Shrubs of *Petalostylis labicheoides*, *Acacia inaequilatera* and *Grevillea wickhamii* over Low Open Shrubland of *Corchorus parviflorus*, *Tephrosia rosea* var. *clementii* and *Isotropis atropurpurea* in brown loamy sand (mudstone at surface) on open valleys
	6f	Hummock Grassland of *Triodia epactia* with High Open Shrubland of *Grevillea wickhamii*, *Acacia orthocarpa* and *Acacia monticola* over Low Open Shrubland of *Acacia adoxa* var. *adoxa*, *Acacia hilliana* and *Acacia stellaticeps* in brown sandy loam on low hills
	6g	Hummock Grassland of *Triodia epactia* with High Open Shrubland of *Acacia ancistrocarpa*, *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* over Low Open Shrubland of *Ptilotus astrolasius*, *Corchorus* cf. *elachocarpus* and *Bonamia rosea* in red orange sand on sandplains
	6h	Hummock Grassland of *Triodia epactia* with Low Open Shrubland of *Pluchea tetranthera* and Scattered High Shrubs of *Acacia inaequilatera*, *Acacia ancistrocarpa* and *Acacia tumida* var. *pilbarensis* in orange sandy loam on plains
	6i	Hummock Grassland of *Triodia epactia* and *Triodia longiceps* with Open Tussock Grassland of *Chrysopogon fallax* and **Cenchrus ciliaris* with Low Open Woodland of *Corymbia flavescens*, *Bauhinia cunninghamii* and *Eucalyptus victrix* in orange loamy sand on floodplains and drainage zones
	6j	Hummock Grassland of *Triodia wiseana* with High Open Shrubland of *Grevillea wickhamii*, *Acacia inaequilatera* and *Acacia sclerosperma* over Low Open Shrubland of *Acacia stellaticeps* in light brown sandy loam on low calcrete rises
	6k	Hummock Grassland of *Triodia epactia* in orange loam on plains
Triodia Open Hummock Grassland	7a	Open Hummock Grassland of *Triodia epactia* with Very Open Tussock Grassland of *Eragrostis xerophila*, *Eriachne benthamii* and *Eriachne flaccida* over Very Open Annual Grassland of *Eragrostis cumingii* and *Sporobolus australasicus* in brown silty clay loam on plains

Broad Floristic Formation	Vegetation Association (Onshore, 2013)	
	7b	Open Hummock Grassland of *Triodia epactia* with Open Scrub of *Acacia ancistrocarpa*, *Acacia acradenia* and *Acacia tumida* var. *pilbarensis* and Scattered Low Trees of *Eucalyptus camaldulensis* var. *obtusa* in orange clay loam on rehabilitated townsite area
Eragrostis Tussock Grassland	8	Tussock Grassland of *Eragrostis xerophila* with Very Open Hummock Grassland of *Triodia epactia* and Very Open Herbs of *Ptilotus murrayi* in orange medium clay on stony cracking clay plains
Eriachne Tussock Grassland	9a	Tussock Grassland of *Eriachne benthamii* with Low Open Woodland of *Eucalyptus victrix* over Open Herbland of *Marsilea hirsuta* and *Centipeda minima* subsp. *macrocephala* in brown sandy clay on plains and drainage lines
	9b	Tussock Grassland of *Eriachne* cf. *glauca*, *Eriachne benthamii* and *Elytrophorus spicatus* over Very Open Herbland of *Marsilea hirsuta*, *Centipeda minima* subsp. *macrocephala* and *Alternanthera nodiflora* in orange light medium clay on gilgai plains
	9c	Tussock Grassland of *Eriachne benthamii* and *Sporobolus mitchellii* in orange light medium clay on gilgai plains
**Cenchrus* Tussock Grassland	10	Tussock Grassland of **Cenchrus ciliaris* with Open Shrubland of *Acacia ancistrocarpa* and *Acacia tumida* var. *pilbarensis* and Open Hummock Grassland of *Triodia angusta* and *Triodia epactia* in orange clay loam on rehabilitated post-mining infrastructure areas
Eriachne Open Tussock Grassland	11	Open Tussock Grassland of *Eriachne benthamii*, *Cynodon dactylon* and *Eragrostis xerophila* over Very Open Herbland of *Centipeda minima* subsp. m*acrocephala*, *Glinus lotoides* and *Marsilea hirsuta* with Scattered Tall Shrubs of **Vachellia farnesiana* in brown medium heavy clay on drainage ponds, depressions and borrow pits
Eragrostis Very Open Tussock Grassland	12	Very Open Tussock Grassland of *Eragrostis xerophila* and *Eriachne benthamii* with Very Open Herbs of *Ptilotus murrayi*, *Sida fibulifera* and *Trianthema triquetra* over Very Open Annual Grassland of *Sporobolus australasicus*, *Eragrostis cumingii* and *Dactyloctenium radulans* in brown light clay on plains

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) were identified within the Amendment Application Area.

One Priority 3 Flora species has been identified within Amendment Application Area (**Figure 2**): *Euphorbia clementii* (Priority 3). This record will be avoided using a 10 m buffer, where practicable.

Should any population of:

- Threatened Flora be identified they will be avoided with a 50m buffer unless they are within previously disturbed areas and areas identified for Closure activities. A Permit to Take will be obtained in Threatened Flora are required to be disturbed.
- Priority listed flora be identified they will be avoided where practicable with a 10 m buffer. If Priority flora are identified within required Closure activity areas they may need to be cleared.

3.4.3 Weeds

Eleven introduced flora species (weeds) has been recorded within the Amendment Application Area (**Table 4**). One species **Tamarix aphylla* (Athel Tree) is listed as a Declared Pest under the *Biosecurity and Agriculture Management Act 2007* (BAM Act). 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]
**Aerva javanica*	Kapok Bush	High and Rapid	No
**Calotropis procera*	Sodam Apple	Not listed	Yes
**Cenchrus ciliaris*	Buffel Grass	High and Rapid	No

[1] BAM Act s22

**Cenchrus setiger*	Birdwood Grass	High and Rapid	No
**Citrullus amarus*	Pie Melon	Unknown and Moderate	No
**Cynodon dactylon*	Couch	High and Rapid	No
**Indigofera oblongifolia*		Not listed	No
**Passiflora foetida*	Stinking Passion Flower	Not listed	No
**Tamarix aphylla*	Athel Tree	High and Rapid	Yes
**Trianthema portulacastrum*	Giant Pigweed	Not listed	No
**Vachellia farnesiana*	Mimosa Bush	High and Rapid	No

3.4.4 Fauna Habitats and Significant Fauna

Biologic (2013) identified the following five vertebrate fauna habitats within the Amendment Application Area (**Figure 3**):

- **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.
- **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.
- **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.
- **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.
- **Hillcrest/ Hillslope:** Comprises a rocky substrate, often with exposed bedrock, on moderate to steep slopes leading into lower footslopes. This habitat was characterised by steep slopes with a high proportion of coarse fragments dominated by ironstone. These can contain cracks and crevices. Instances of Gorge/ Gully is contained within this habitat. This habitat is usually dominated by open *Eucalyptus* woodlands, *Acacia* and *Grevillea* scrublands and *Triodia* low hummock grasslands.

Biologic (2013) identified the following two vertebrate fauna habitats which have been excluded from the Amendment Application Area (**Figure 3**):

- **Gorge / Gully:** Gorges and gullies are rugged, steep-sided valleys incised into the surrounding landscape. Gorges tend to be deeply incised, with vertical cliff faces, while gullies are more open (but not as open as Minor Drainage Lines). Caves and rock pools are most often encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.
- **Breakaway/ Cliffs:** Breakaway/ Cliffs are rugged, incised rocky hills and ranges. They tend to contain large rock fragments and more rock outcropping than other fauna habitats. Significant habitat features such as caves were sometimes encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.

All caves and waterholes (**Figure 3**) have been clipped out of the Amendment Application Area.

The fauna habitats identified within the Amendment Application Area extend beyond the project boundary and are common in the surrounding region.

Six fauna species of significance have been recorded from areas excluded from the Amendment Application Area (**Figure 4**), however given the proximity these species are considered to be recorded for the purposes of this application :

- Brush-tailed mulgara (*Dasycercus blythi*) (DBCA Priority 4)
- Ghost Bat (*Macroderma gigas*) (EPBC Act and BC Act Vulnerable);

- Greater Bilby (*Macrotis lagotis*) (EPBC Act and BC Act Vulnerable);
- Northern Quoll (*Dasyurus hallucatus*) (EPBC Act and BC Act Endangered);
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (EPBC Act and BC Act Vulnerable); and
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (DBCA Priority 4).

Based on the occurrence of the habitat types and significant fauna species previously recorded in the vicinity an additional three 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):

- Fork-tailed Swift (*Apus pacificus*) (EPBC Act and BC Act Migratory).
- Pilbara Olive Python (*Liasis olivaceus* subsp. *barroni*) (EPBC Act and BC Act Vulnerable); and
- Peregrine Falcon (*Falco peregrinus*) (BC Act 'Other Specially Protected Fauna').

An assessment of the potential impact of the proposed clearing on the species of significant fauna that may occur in the application amendment 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					
Fork-tailed Swift (*Apus pacificus*)	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.
Peregrine Falcon (*Falco peregrinus*)	Other Specially Protected Fauna (BC Act)	The Peregrine Falcon is uncommon but wide ranging across Australia. They occur mainly along coastal cliffs, rivers and ranges as well as wooded watercourses and lakes. The Peregrine Falcon nests primarily on cliffs, granite outcrops and quarries, and feed mostly on birds (Johnstone and Storr 1998).	There are no suitable breeding sites in the Amendment Application Area for this species as all large cliffs and breakaways suitable for this species to generate nests have been excluded from the Amendment Application Area. It may forage in the Amendment Application Area as part of a wider home range.	Possible	**Low** The proposed clearing activities are unlikely to impact on the Peregrine Falcon as: • Breakaway habitat has been excluded from the Amendment Application Area; • It has the ability to egress from areas being disturbed • there is large amounts of suitable foraging and nesting habitat for this species outside of the Application Area.
Mammals					
Brush-tailed Mulgara (*Dasycercus blythi*)	Priority 4 (DBCA)	Brush-tailed mulgaras occur in a range of vegetation types, however, the principal habitat is mature hummock grasslands of spinifex, especially *Triodia basedowii* and *T. pungens* (Masters *et al*., 2003). Note: Woolley, et. al. (2013) noted that the Crest-tailed Mulgara (*Dasycercus cristicauda*) is unlikely to occur within the Pilbara.	The Sand Plain habitats of the Application Area represent suitable habitat for this species. Mulgara burrows and scats were located on a sandplain in the west of the Application Area (Biologic, 2013). There are a large number of records in the broader region.	Recorded	**Low** There is likely to be a low impact on this species given that: • Known burrows have been excluded from the Amendment Application Area. • the Sand Plain habitat within the Application Area is widespread throughout the Pilbara; and • If any active Brush-tailed Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable.

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Ghost Bat (*Macroderma gigas*)	EPBC Act Vulnerable BC Act Vulnerable	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 (Worthington-Wilmer et al. 1994). 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).	The caves in the biologic (2013) Study Area (**Figure 3**) are suitable as feeding roosts and possibly day roosts for the Ghost Bat. The Biologic (2013) survey recorded scats from three caves and calls near one (possibly two) of the caves. These caves have been excluded from the Amendment Application Area.	Recorded	**Low** Biologic (2013) identified a number of suitable caves to act as feeding roosts and possibly day roosts. These caves have been excluded from the Amendment Application Area. Impact to the Ghost Bat is considered low however as no disturbance will occur within 100m of these caves. Additionally, known roost caves for the Ghost Bat are located approximately 80km east and possible roosts 5km south of the Amendment Application Area (Biologic, 2013).
Greater Bilby (*Macrotis lagotis*)	EPBC Act Vulnerable BC Act Vulnerable;	Three major vegetation types associated with the Greater Bilby are listed by Southgate (1990) including: open tussock grassland on uplands and hills, Mulga woodland/shrubland on ridges and rises, and hummock grassland in plains and alluvial areas. Other habitats used by the species include stony downs, cracking clays, desert sandplains and dune fields, spinifex grassland and *Acacia* species shrublands on red earths (Johnson, 2008).	The areas of sandplain with tussock grasses, hummock grasses and pindan woodland within the Amendment Application Area are considered potentially suitable habitats for this species. Fresh digging and scats scattered within the Amendment Application Area were identified during Biologic (2013) survey.	Recorded	**Low** There is likely to be a low impact on this species given that: • the Sand Plain habitat within the Amendment Application Area is widespread throughout the Pilbara; and • Known burrows have been excluded from the Amendment Application Area; and • If any active Greater Bilby burrows are identified they will be avoided using a 10 m buffer, where practicable.
Northern Quoll (*Dasyurus hallucatus*)	EPBC Act Endangered BC Act Endangered	Northern Quoll populations occur in six geographical centres around Australia, including: Drummond Range, Central Queensland; the wet tropics of Northern Queensland; northern Cape York Peninsula; northern and western Top End, Northern Territory; north Kimberley and the Pilbara, Western Australia (Braithwaite and Griffiths, 1994). Northern Quoll denning habitat in the Pilbara is associated with rocky habitats or riverine habitats with mature Eucalypt trees with hollows (SEWPaC, 2011).	Much of the Amendment Application Area is suitable foraging habitat for the Northern Quoll. Suitable denning habitat for this species is mostly confined to the Gorge/ Gully habitat (which has been excluded from the Amendment Application Area), however it is possible for this species to den within small rocky outcrops located throughout the Crest/Slope habitat (Biologic, 2013).	Recorded	**Low** There is likely to be a low impact on this species given that: • similar suitable habitat is widespread throughout the surrounding area and the wider Pilbara area; • Gorge/ Gully habitat has been excluded from the Application Area; and • Records of the Northern Quoll have been excluded from the Amendment Application Area.

Significant Species	Conservation Status	Distribution and Ecology	Habitat Relevance	Likelihood	Potential Impact on Species
Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*)	EPBC Act Vulnerable BC Act Vulnerable;	As they are poor thermoregulators, the Pilbara Leaf-nosed Bat requires hot, humid, deep caves or disused mine shafts in which to roost (van Dyck and Strahan, 2008). 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. The Biologic (2013) survey made one record of this species which has been excluded from the Amendment Application Area. While there is no suitable habitat for this species within the Amendment Application Area, it is likely that there is an unknown roost in the vicinity of Goldsworthy, outside of the Application Area (Biologic, 2013).	Recorded	**Low** While this species may forage over the habitats within the Amendment Application Area and surrounds. The Pilbara Leaf-nosed Bat is not dependant on habitat within the Amendment Application Area as no suitable roosts for this species occur within the Amendment Application Area.
Western Pebble-mound mouse (*Pseudomys chapmani*)	DBCA Priority 4	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).	While suitable Crest / Slope habitat exists over most of the hill ranges in the Application Area, all records of this species in the Biologic (2013) survey were of inactive mounds. Suitable habitat for this species is common in surrounding area and throughout the Pilbara.	Recorded	**Low** There is likely to be a low impact on this species given that: • There is a large area of suitable habitat in a similar or better condition adjacent to the Application Area; • No active mounds have been identified; and • The one recorded (inactive) has been excluded from the Amendment Application Area; and • If any active Western Pebble-mound Mouse mounds are identified they will be avoided using a 10 m buffer, where practicable.
Reptiles					
Pilbara Olive Python(*Liasis olivaceus* subsp. *barroni*)	EPBC Act Vulnerable BC Act Vulnerable	Pilbara Olive Pythons are widespread across the Pilbara, with many significant populations remaining (Pearson, 2003). The Pilbara Olive Python is found in a range of habitats, including drier areas of woodland, escarpments, rocky gorges, gullies and around watercourses (Wilson and Swan, 2010). This species is known to den / shelter in rocky crevices or tree hollows and are often associated with areas containing watercourses. The Pilbara Olive Python uses drainage line habitat to forage and disperse throughout the landscape.	Deep rocky gullies have been excluded from the Amendment Application Area. The Major Drainage Line habitat provides habitat and dispersal opportunities for the Pilbara Olive Python.	Possible	**Low** The Pilbara Olive Python is unlikely to be reliant on habitat within the Amendment Application Area, however this species may utilise the Amendment Application Area intermittently whilst dispersing along drainage lines. There are larger areas of more suitable rocky and drainage line habitat in a similar or better condition adjacent to the Amendment Application Area and in the wider area.

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).

Aquifers in the area are present mainly within two distinct hydrogeological units. One is the narrow strips of the alluvial deposits of the major drainages, notably the De Grey River, and the other is the Archaean bedrock which underlies the region and forms the ranges such as Mount Goldsworthy. Aquifers, both in the fractured rocks and alluvium, are recharged by infiltration of summer rains, particularly along drainage lines such as the De Grey River (Aquaterra, 2012).

The south western portion of the Amendment Application Area is also located in the De Grey River Water Reserve, a Public Drinking Water Source Area (DoW, 2000). The De Grey River Water Reserve was established to protect the De Grey River wellfield, which is sourced from an aquifer of alluvial deposits of the De Grey River (DoW, 2000). Mining and extractive industries are conditional land uses in a Public Drinking Water Source Area (DoW, 2000).

3.6 SURFACE WATER

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

The general topography to the west of the Goldsworthy catchment boundary trends westwards towards Pardoo Creek which discharges into the De Grey River further downstream. To the north of the catchment boundary, the topography drains northwest towards Pardoo Creek. South of the catchment boundary, the topography trends downwards to the south and Pardoo Creek (Aquaterra, 2012).

The disused pit at Goldsworthy receives surface water from a catchment of approximately 1.6km^2. Surface water entering the pit is mainly as a result of runoff from the surrounding waste dumps. The mine pit is located on a high point in relation to the surrounding area (Aquaterra, 2012).

The Amendment Application Area contains three non-perennial creeklines: Pardoo Creek a non-perennial major creekline and two un-named non-perennial minor creeklines. The Amendment Application Area is also located approximately 1.5 km north east of the De Grey River.

The biologic (2013) fauna survey identified four water bodies, in addition to the flooded pit (**Figure 3**). Two of the water bodies were small rock pools in gorges, and two were river pools in the Pardoo Creek. The survey was not able to ascertain whether these water bodies are permanent (biologic, 2013). These four pools have been excluded from the 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
a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	a1) Native vegetation should not be cleared if it is representative of an area of outstanding biodiversity in the Bioregion.	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.	Not at variance with clearing principle.
	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.	The native vegetation within the Amendment Application Area is in the same condition as other areas of similar vegetation type within the broader region.	Not at variance with clearing principle.
	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.	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.	Not at variance with clearing principle.
	a4) Native vegetation should not be cleared if it has higher ecosystem diversity than other native vegetation of that local area.	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.	Not at variance with clearing principle.
	a5) Native vegetation should not be cleared if it has higher genetic diversity than the remaining native vegetation of that ecological community.	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.	Not at variance with clearing principle.
	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.	The one known record of Priority flora has been excluded from the Amendment Application Area using a 10 m buffer. Should any population of Priority listed flora be identified they will be avoided where practicable with a 10 m buffer. If Priority flora are identified within required Closure activity areas they may need to be cleared.	Not at variance with clearing principle.

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 five broad fauna habitat types within the Amendment Application Area (**Figure 3**).

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

Six fauna species of significance have been recorded from areas excluded from the Amendment Application Area with an additional three 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
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.	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.	Four BC Act protected species has been recorded from areas excluded from the Amendment Application and three 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: • All species are wide-ranging and found throughout the broader region; • Most species are only likely to forage within the Amendment Application Area; • Any resident potential residents have the ability to disburse away from the clearing activities with large areas of suitable habitat in the surrounds. • These species do not exclusively depend on any habitat type or feature within the Amendment Application Area; • If any active Greater Bilby burrows are identified they will be avoided using a 10 m buffer, where practicable. • All Gorge/ Gully and Breakaway habitats have been excluded from the Amendment Application Area; • All caves and waterhole have been excluded from the Amendment Application Area; and • Similar habitat is well represented outside the Amendment Application Area.	Unlikely to be at variance with clearing principle.
	b2) Native vegetation should not be cleared if it is or is likely to be habitat for Priority Listed Fauna.	Two priority fauna species have been recorded from areas excluded from the Amendment Application Area and no other priority species are considered likely to potentially occur. As detailed in **Table 5** these species are unlikely to be impacted for the following reasons: • 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; • If any active Brush-tailed Mulgara burrows are identified they will be avoided using a 10 m buffer, where practicable. • The known (inactive) Western Pebble-mound Mouse mounds has been excluded from the Amendment Application Area; and • If any active Western Pebble-mound Mouse mounds are identified they will be avoided using a 10 m buffer, where practicable.	Not at variance with clearing principle.
	b3) Native vegetation should not be cleared if it	Habitat found within the Amendment Application Area may be suitable for	Not at variance with

Principle	Criteria	Assessment	Outcome
	is or is likely to be habitat for fauna that is otherwise significant.	use by conservation significant fauna, however similar habitat in the same or better condition is widespread in the Amendment Application Area surrounds	clearing principle.
	b4) Native vegetation should not be cleared if it provides significant habitat for fauna species in the local area.	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 to the area surrounding of the Amendment Application Area.	Not at variance with clearing principle.
	b5) Native vegetation should not be cleared if it maintains ecological functions and processes that protect significant habitat for fauna.	The clearing of native vegetation is not considered to alter ecological functions and processes that protect significant habitat for fauna.	Not at variance with clearing principle.
	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 *in situ* existence of populations of Declared Rare Flora under the *BC Act 2016*	No Threatened flora species were recorded in the Amendment Application Area (Onshore, 2013). Should any population of Threatened Flora be identified they will be avoided with a 50m buffer unless they are within previously disturbed areas and areas identified for Closure activities. A Permit to Take will be obtained in Threatened Flora are required to be disturbed.	Not at variance with clearing principle.
	c2) Native vegetation should not be cleared if it is necessary for the continued *in situ* existence of other significant flora.	No species listed under the EPBC Act or other significant flora species were recorded in the Amendment Application Area (Onshore, 2013). Should any population of Threatened Flora be identified they will be avoided with a 50m buffer unless they are within previously disturbed areas and areas identified for Closure activities. A Permit to Take will be obtained in Threatened Flora are required to be disturbed.	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 proposed Amendment Application Area are associated with a TEC or PEC. The closest PEC is more than 24 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 *Environment Protection and Biodiversity Conservation Act 1999* 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 *Environment Protection and Biodiversity Conservation Act 1999*.	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 other 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 *in situ* 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 habitats and vegetation within the Amendment Application Area are 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 / or 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
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.	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).	Clearing native vegetation within the Amendment Application Area will not reduce the extent of native vegetation below 30% in the bioregion or subregion.	Not at variance with clearing principle.
	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).	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 is more than 98% of pre-European extents.	Not at variance with clearing principle.
	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)	Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the vegetation community in the bioregion.	Not at variance with clearing principle.
	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.	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.	Not at variance with clearing principle.
	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.	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.	Not at variance with clearing principle.
	e6) Native vegetation should not be cleared if clearing would reduce any ecological community to less than 1% of the Local Area.	Clearing native vegetation within the Amendment Application Area will not significantly reduce the known extent of the vegetation community in the local area.	Not at variance with clearing principle.

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.

There is one major non-perennial creek and two non-perennial minor drainage lines that flow across 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
f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	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.	No watercourses of significant environmental value occur within the Amendment Application Area	Unlikely to be at variance with clearing principle.
	f2) Native vegetation should not be cleared if it provides a buffer area for watercourses and wetlands identified in criteria (f1) and (f2).	No native vegetation occurs within the Amendment Application Area that provides a buffer to watercourses or wetlands that have been identified as having significant environmental values.	Unlikely to be at variance with clearing principle.
	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.	Due to the purpose of the 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.	Not at variance with clearing principle.
	f4) Native vegetation should not be cleared if it is growing in other watercourses or wetlands.	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.	Unlikely to be at variance with clearing principle.

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 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 proposed rehabilitation activities at Goldsworthy and 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

Eleven introduced flora species has been recorded in the Amendment Application Area (**Table 4**). This species is not listed as a Declared Pest under the BAM Act and is common 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 ongoing use.	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 Millstream Chichester National Park which is more than 200 km southwest 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 more than 140 km west 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.

There is one major non-perennial creek and two non-perennial minor drainage lines that flow across 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 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 PEAHR. The PEAHR process ensures that all heritage sites in the vicinity of the Project Area are identified and avoided where practicable.

The Amendment Application Area falls within the Ngarla People (Mount Goldsworthy Lease Proceeding) Native Title Claim (WC1999/026) and Ngarla and Ngarla 2 (Area A) Native Title Claim (WC1999/026).

Archaeological and ethnographic surveys of the proposed Amendment Application Area have been undertaken by BHP and a number of heritage sites have been identified. All heritage sites will be avoided, however if any heritage site cannot practicably be avoided, BHP 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. The proposed clearing is unlikely to have any significant negative impacts on biodiversity and environmental values in the area.

While the permit includes a large amount of clearing for Closure activities, clearing will only be undertaken in these areas if required to improve the Closure outcomes / rehabilitation of the area with the minimum requirement to deliver a safe, stable and non-polluting final landform.

9 REFERENCES

Beard, JS (1975) *Vegetation Survey of Western Australia; Sheet 5 Pilbara*. University of Western Australia Press, Perth, Western Australia.

BHP (2024) *BHP Iron Ore Annual Environmental Report July 2023 – June 2024*.

Biologic (2013) *Goldsworthy fauna assessment*. Unpublished report prepared for BHP Pty Ltd.

BOM (Bureau of Meteorology) (2024a) Climate statistics for Australian locations: Port Hedland Airport. http://www.bom.gov.au/climate/averages/tables/cw_004032.shtml. Accessed 14 June 2024

BoM (2024b) *Climate statistics for Australian locations – Wittenoom.*
Website: www.bom.gov.au/climate/averages/tables/cw_005026.shtml Accessed: 14 June 2024.

Braithwaite, R.W., and A., Griffiths (1994). *Demographic variation and range contraction in the northern quoll Dasyurus hallucatus* (*Marsupialia: Dasyuridae*). Wildlife Research 21:203-17

Churchill, S. K. (2008). 'Australian Bats.' (Allen and Unwin: Sydney).

CSIRO (2014) *Australian Soil Resource Information System (ASRIS).* Available from: http://www.asris.csiro.au/index.html, Accessed 31/03/2021.

Department of Water, 2009a. *Groundwater Proclamation Areas 2009*. Accessed 19 February 2015 at http://www.water.wa.gov.au/PublicationStore/first/86307.pdf.

Department of Water, 2009b. *Surface Water Proclamation Areas 2009*. Accessed 19 February 2015 at http://www.water.wa.gov.au/PublicationStore/first/86306.pdf.

Johnson, K. A. (2008) *Bilby Macrotis lagotis* (Reid, 1837). In: S. Van Dyck and R. Strahan (eds.) *The Mammals of Australia Third edition*. p 191-193. New Reid Holland, Sydney.

Johnstone, RE and G.M., Storr (1998) *Handbook of Western Australian Birds: Volume 1 – Non-passerines (Emu to Dollarbird).* Western Australian Museum, Perth, Western Australia.

Kendrick, P and McKenzie, N (2001) *Pilbara 1 (PIL1) – Chichester subregion*. *In: A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002.* Department of Conservation and Land Management, Western Australia.

Kendrick, P and Stanley, F (2001) *Pilbara 4 (PIL4 – Roebourne Synopsis). In: A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002.* Department of Conservation and Land Management, Western Australia.

Masters, P. (2008) *Brush-tailed Mulgara*. In: Van Dyck, S. & R. Strahan, eds. The Mammals of Australia. Page(s) 49-50. 3rd edition. New Holland Publishers.

Menkhorst, P and F., Knight (2004) *A Field Guide to the Mammals of Australia, Second edition*.

Onshore (2013) *Flora and Vegetation Survey – Goldsworthy*. Unpublished report prepared for BHP Pty Ltd.

Pearson, D (2003) *Giant Pythons of the Pilbara.* Landscope 19, 32-39

Pilbara Flora (2008) *Flora and Vegetation Survey of the Goldsworthy Minesite*. Unpublished report prepared for BHP Pty Ltd.

SEWPaC (2011) *Draft Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for the endangered northern quoll, Dasyurus hallucatus*. Department of Sustainability, Environment, Water Population and Communities.

van Dyck, S and Strahan R (2008) *The Mammals of Australia – Third Edition*. Reed New Holland, Sydney.

van Vreeswyk, A.M.E, Payne, A.L, Leighton, K.A. and Hennig, P. (2004) *An inventory and condition survey of the Pilbara region, Western Australia*. Western Australian Department of Agriculture Technical Bulletin No. 92.

Wilson, S and Swan, G (2010) *A Complete Guide to Reptiles of Australia*. New Holland Publishers, Australia.

Woolley, P.A., Haslem, A and Westerman M (2013) *Past and present distribution of Dasycercus: toward a better understanding of the identity of specimens in cave deposits and the conservation status of the currently recognised species D. blythi and D. cristicauda (Marsupialia : Dasyuridae).* Australian Journal of Zoology, 2013, 61, 281–290.

Worthington-Wilmer J., Moritz C., Hall L. and Toop J. (1994) *Extreme population structuring in the threatened Ghost Bat, Macroderma gigas: evidence from mitochondrial DNA*. Proceedings of the Royal Society, London (1974) 257, 193–198.

Figures

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Goldsworthy Mainline

Goldsworthy Pit

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Kilometers

PORT HEDLAND

BHP ENVIRONMENTAL APPROVALS

N

GOLDSWORTHY NVCP CPS 5572/2 AMENDMENT

REGIONAL OVERVIEW

SCALE (A3): 1:40,000	DATUM: GDA202/MGA 50	FIGURE 1
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 25 November 2024	Dwg: YAR_007NVCP_001_RevA_0

Legend

Proposed Boundary for CPS 5572/3

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Goldsworthy Mainline

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Legend

Proposed Boundary for CPS 5572/3

Significant Flora Location

Euphorbia clementii (Priority 3)

Broad Floristic Communities

*Cenchrus Tussock Grassland
Eragrostis Tussock Grassland
Eragrostis Very Open Tussock Grassland
Eriachne Open Tussock Grassland
Eriachne Tussock Grassland
Triodia Hummock Grassland
Triodia Open Hummock Grassland
Acacia Closed Scrub
Acacia Low Open Heath
Acacia Open Scrub
Grevillea Open Scrub
Terminalia Low Woodland
Cleared

BHP ENVIRONMENTAL APPROVALS

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GOLDSWORTHY NVCP CPS 5572/2 AMENDMENT

BROAD FLORISTIC COMMUNITIES AND SIGNIFICANT FLORA

SCALE (A3): 1:40,000	DATUM: GDA202/MGA 50	FIGURE 2
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 25 November 2024	Dwg: YAR_007NVCP_002_RevA_0

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Goldsworthy Mainline

BHP ENVIRONMENTAL APPROVALS

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GOLDSWORTHY NVCP CPS 5572/2 AMENDMENT

VERTEBRATE FAUNA HABITAT AND HABITAT FEATURES

SCALE (A3): 1:40,000	DATUM: GDA202/MGA 50	FIGURE 3
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 25 November 2024	Dwg: YAR_007NVCP_003_RevA_0

Legend

- Proposed Boundary for CPS 5572/3

Habitat Features

- Cave
- Waterhole

Habitat Type

- Minor Drainage Line
- Major Drainage Line
- Sand Plain
- Stony Plain
- Hillcrest/ Hillslope
- Gorge/ Gully
- Breakaway/ Cliff
- Cleared/ Disturbed

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Goldsworthy Mainline

BHP ENVIRONMENTAL APPROVALS

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GOLDSWORTHY NVCP
CPS 5572/2 AMENDMENT
SIGNIFICANT FAUNA

SCALE (A3): 1:40,000	DATUM: GDA202/MGA 50	FIGURE 4
Prepared: Chris Hopkins	Revision: FINAL	
Centre: Perth	Date: 25 November 2024	Dwg: YAR_007NVCP_004_RevA_0

Legend

Proposed Boundary for CPS 5572/3

Significant Fauna

- Brush-tailed Mulgara (Dasycercus blythi) (DBCA Priority 4)
- Ghost Bat (Macroderma gigas) (EPBC Act and BC Act Vulnerable)
- Greater Bilby (Macrotis lagotis) (EPBC Act and BC Act Vulnerable)
- Northern Quoll (Dasyurus hallucatus) (EPBC Act and BC Act Endangered)
- Pilbara Leaf-nosed Bat (Rhinonicteris aurantia) (EPBC Act and BC Act Vulnerable)
- Western Pebble-mound Mouse (Pseudomys chapmani) (DBCA Priority 4)

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Appendices

Appendix 1: *Flora and Vegetation Survey – Goldsworthy* (Onshore, 2013)

Appendix 2: *Flora and Vegetation Survey of the Goldsworthy Minesite* (Pilbara Flora, 2008)

Appendix 3: *Goldsworthy fauna assessment* (Biologic Environmental Survey, 2013)