

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	4397/8
Permit type:	Purpose Permit
Applicant name:	Robe River Limited
Application received:	21 September 2022
Application area:	750 hectares
Purpose of clearing:	Mineral Exploration, Hydrogeological Drilling, Geotechnical Investigations, Construction Camp and Associated Activities.
Method of clearing:	Mechanical Removal
Tenure:	<i>Iron Ore (Robe River) Agreement Act 1964</i> , Mineral Lease 248SA (AML70/248)
Location (LGA area/s):	Shire of Ashburton
Colloquial name:	Jimmawurrada and Mesa H Project

1.2. Description of clearing activities

Robe River Limited proposes to clear up to 750 hectares of native vegetation within a boundary of approximately 10,267 hectares, for the purpose of mineral exploration, hydrogeological drilling, geotechnical investigations, construction camp and associated activities. The project area is located approximately 115 kilometres east of Onslow within the Shire of Ashburton.

Clearing permit CPS 4397/1 was granted by the Department of Mines and Petroleum on 1 September 2011 and authorised the clearing of up to 196 hectares of native vegetation within a permit boundary of approximately 2,518 hectares.

CPS 4397/1 was amended on 20 November 2014 to increase the amount of clearing authorised to 600 hectares and increase the permit boundary to 5,587 hectares. It was also amended to remove Conditions 2 and 3 from the permit and extend the duration of the clearing to 31 July 2020.

CPS 4397/2 was amended on 19 March 2015, increasing the permit boundary to 7,206 hectares and adding hydrological drilling, geotechnical investigations and associated activities to the purpose.

CPS 4397/3 was amended on 17 March 2016, increasing the permit boundary from 7,206 hectares to 7,700 hectares, increasing the clearing authorised from 600 hectares to 700 hectares, amending the reporting date from 31 July each year to 30 June to report on clearing carried out between 1 January and 30 December, and extending the permit expiry date from 31 July 2025 to 31 December 2025.

CPS 4397/4 was amended on 8 September 2016 to increase the permit boundary from 7,700 hectares to 7,750 hectares, and amend the purpose of clearing to include 'construction camp'.

CPS 4397/5 was amended on 11 May 2017 to merge the clearing permit with CPS 4303/2, increase the merged area approved to clear by 50 hectares, increase the permit boundary by 2,478 hectares, extend the period in which clearing is authorised to 31 July 2022, and extend the permit duration to 31 July 2027.

CPS 4397/6 was amended on 12 October 2017 to increase the clearing permit boundary from approximately 10,228 hectares to 10,267 hectares. The clearing area remained at 750 hectares.

On 21 September 2022, the Permit Holder applied to amend CPS 4397/7 to extend the period authorised for vegetation clearing from 31 December 2022 to 31 December 2026 and to extend the expiry date of the permit from 31 December 2027 to 31 December 2031.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	22 December 2022
Decision area:	750 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). DMIRS advertised the application for a public comment for a period of 7 days, and no submissions were received.

The assessment has not changed since the assessment for CPS 4397/7. The Delegated Officer determined that the proposed permit duration extension of four years is not likely to lead to an unacceptable risk to environmental values.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mining Act 1978* (WA)
- *Iron Ore (Robe River) Agreement Act 1964* (WA)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

No evidence of avoidance or mitigation measures was provided to support the application.

3.2. Assessment of impacts on environmental values

No new biological information has been provided in support of the amendment application. The environmental values of the application area are described in previous versions of the decision reports for CPS 4397/1 – 4397/7. The previous assessments identified several environmental impacts from the relative approved clearing. These are summarised below:

- Potential impacts to Priority Ecological Community (PEC) 'Triodia pisolitica (previously Triodia sp. Robe River) assemblages of mesas of the West Pilbara' (Priority 3);
- Impacts to *Triodia pisolitica* Trudgen & M.D.Barrett (Formerly *Triodia* sp. Robe River) (M.E. Trudgen et al. MET 12367) (Priority 3), *Rhynchosia bungarensis* (Priority 4), *Eragrotis surreyana* (Priority 3) and *Indigofera* sp. Bungaroo (Priority 3);
- Impacts to biodiversity from the spread of weeds and clearing of fauna habitat;
- Potential impacts to riparian vegetation associated with the Robe River and Jimmawurrada Creek;
- Land degradation in the form of erosion within the River land system; and
- Clearing within a Public Drinking Water Source Area, which may impact groundwater quality.

The current permit conditions imposed on CPS 4397/7 will assist in minimising and mitigating potential impacts to the above environmental values. These conditions have been applied to this amended clearing permit to continue to minimise impacts to such values by restricting clearing in areas that potentially comprise habitat for priority flora (Mosaic vegetation unit) and vegetation types that are associated with the PEC (AiTwTspr and ChAiTwTspr vegetation units).

A review of previous assessments has been conducted to conclude that the priority species identified within the permit area are found throughout the broader West Pilbara region with some species also found in the Murchison and Gascoyne regions (Western Australian Herbarium, 1998-). The current permit conditions are considered sufficient in managing impacts to these species within the application area.

Based on the current environmental information, the extension of the permit duration by four years is unlikely to significantly change the environmental impacts of the proposed clearing. There are no new records of conservation significant fauna, flora or vegetation associated with a Priority or Threatened Ecological Community within the application area (GIS Database). As such, the assessment against the clearing principles has not changed significantly from the previous clearing permit decision reports prepared for CPS 4397/1 – 4397/7.

A review of the Robe River Limited Annual Clearing Report for the 1 January to 31 December 2020 reporting period indicated that approximately 385.52 hectares of native vegetation has been cleared out of the approved 750 hectares. Given that over half of the approved clearing area has already been cleared and this amendment does not propose any additional clearing, a clearing permit duration extension of four years is unlikely to lead to supplementary significant impacts on environmental values. The conditions imposed for clearing permit CPS 4397/7 are considered adequate to manage any potential residual environmental impacts and will be retained for the duration of the amended permit (CPS 4397/8).

The application area is within the gazetted Bungaroo Creek Water Reserve (WT10607) under the CAWS Act (GIS Database). The Bungaroo Creek Water Reserve is approximately 126,119 hectares in size. It supplies bulk water into the West Pilbara Water Supply Scheme in accordance with the Deed of Agreement between Rio Tinto and the State of Western Australia. The West Pilbara Water Supply Scheme supplies water resources to the towns of Karratha, Dampier, Roebourne, Cape Lambert and Point Samson (Department of Water, 2012). The activities proposed are in line with the Deed of Agreement and the current rehabilitation condition that exists for CPS 4397/7 is considered sufficient in minimising potential impacts to groundwater quality.

The application area has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the *Environmental Protection Act 1986*, and the proposed clearing is at variance to Principles (a), (b) and (f), may be at variance to Principle (g) and is not likely to be at variance to Principles (c), (d), (h), (i) and (j) and is not at variance to Principle (e) and (f).

3.3. Relevant planning instruments and other matters

The clearing permit amendment application was advertised on 21 October 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one Native Title claim (WC1999/012) over the area under application (DPLH, 2022). This claim has been filed at the Federal Court on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993*, and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process. Therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are numerous registered Aboriginal Sites of Significance within the application area (DPLH, 2022). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

End

Appendix A. Site Characteristics

A.1. Site characteristics

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is surrounded by land predominantly used for mining operations. The area proposed to be cleared has been subject to ongoing mining operations and disturbances for numerous years.
Ecological linkage	According to available databases, there are no formal ecological databases within the application area (GIS Database).
Conservation areas	There are no conservation areas within the application area. The nearest conservation area is the Cane River Conservation Park located approximately 45 kilometres south-west of the application area (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>82: hummock grasslands, low tree steppe; Snappy Gum over <i>Triodia wiseana</i>;</p> <p>603: hummock grasslands, sparse shrub steppe, <i>Acacia bivenosa</i> over hard spinifex;</p> <p>605: hummock grasslands, shrub steppe; <i>Acacia pachycarpa</i> and waterwood over soft spinifex; and</p> <p>609: mosaic: hummock grasslands, open low tree steppe; Bloodwood with sparse Kanji shrubs over soft spinifex / hummock grasslands, open low tree steppe; Snappy Gum over <i>Triodia wiseana</i> on a lateritic crust (GIS Database).</p> <p>Numerous flora surveys have been conducted over the permit area (Rio Tinto, 2017). The vegetation associations recorded across these surveys can be classed into three main landforms: vegetation of mesa tops/hilltops and mesa slopes/hill slopes, vegetation of major and minor drainage lines, and vegetation of plains (Rio Tinto, 2017). The individual vegetation associations are described in Appendix E.</p>
Vegetation condition	<p>The vegetation survey indicate the vegetation within the proposed clearing area is in Excellent to Completely Degraded (Trudgen, 1991) condition (Rio Tinto, 2017), described as:</p> <ul style="list-style-type: none"> • Excellent • Very good • Completely Degraded <p>The full Trudgen (1991) condition rating scale is provided in Appendix D.</p>
Climate and landform	<p>The regional climate is semi-arid to semi-tropical with a summer rainfall season and relatively dry winter season, which varies in frequency and volume from year to year. The summer wet months extend from November to April when temperatures can exceed 47°C. The remainder of the year is moderate to warm with an average of 13°C, in June and July. The closest data for Pan evaporation rates are in Port Hedland, which averages 3,500 mm per annum, exceeding annual rainfall averages (Rio Tinto, 2017).</p> <p>Annual rainfall is variable with tropical lows producing large regional rainfall events (between 100 mm and 200 mm in a few days) to isolated thunderstorm events in the dry (winter) season (BoM, 2022). For Pannawonica (the nearest meteorological station); the mean annual rainfall for the period 1971 to 2015 is 404.0 mm, with most precipitation occurring between January and March, coinciding with the cyclone season (Rio Tinto, 2017).</p>
Land Systems	The application area is located within the McKay, Boolgeeda, Newman, River, Urandy and Robe land systems (GIS Database).
Land degradation risk	The McKay, Boolgeeda, Newman, Urandy and Robe land systems are not considered by Van Vreeswyk et al. (2004) to be susceptible to soil erosion. The River land system can be susceptible to erosion is if vegetative cover is removed.
Waterbodies	Several minor drainage lines intersect the application area (GIS Database). Two major drainage systems are present within the amendment area, the Robe River and Jimmawurrada Creek (Rio Tinto, 2017; GIS Database). The riparian zone vegetation of the Robe River was identified as being of significance by CALM (2002) and is also considered to be an Ecosystem at Risk (CALM, 2002).
Hydrogeography	The application area is within the gazetted Bungaroo Creek Water Reserve (WT10607) under the CAWS Act (GIS Database). The Bungaroo Creek Water Reserve is approximately 126,119 hectares in size. It supplies bulk water into the West Pilbara Water Supply Scheme in

Characteristic	Details
	accordance with the Deed of Agreement between Rio Tinto and the State of Western Australia. The West Pilbara Water Supply Scheme supplies water resources to the towns of Karratha, Dampier, Roebourne, Cape Lambert and Point Samson (Department of Water, 2012).
Flora	<p>There are known records of priority flora within the application area. These include:</p> <ul style="list-style-type: none"> • <i>Stylidium weeliwolli</i> (Priority 3) • <i>Triodia pisolitica</i> Trudgen & M.D.Barrett (Formerly <i>Triodia</i> sp. Robe River) (Priority 3) • <i>Rhynchosia bungarensis</i> (Priority 4) • <i>Eragrostis surreyana</i> (Priority 3) (GIS Database) <p>No threatened flora have been recorded within the application area (GIS Database, Rio Tinto 2017).</p>
Ecological communities	<p>There are no Threatened Ecological Communities within the application area. There are three Priority Ecological Communities that intersect the application area (GIS Database). These include:</p> <ul style="list-style-type: none"> • Subterranean invertebrate community of pisolitic hills in the Pilbara (Priority 1) • Stygofaunal Community of the Bungaroo Aquifer (Priority 1) • Subterranean invertebrate communities of mesas in the Robe Valley region (Priority 1)
Fauna	<p>A desktop survey utilising previous surveys and databases identified 23 conservation significant fauna species that may occur within the application area (Rio Tinto, 2017). Based on preferred habitat, the likelihood of these species was then revised. Seven species were considered 'likely' or have the 'potential' to occur within the application area. These species are: <i>Dasyurus hallucatus</i> (Northern Quoll); <i>Liasis olivaceus subsp. barroni</i> (Pilbara Olive Python); <i>Macroderma gigas</i> (Ghost Bat); <i>Rhinonictis aurantia</i> (Pilbara Leaf-nosed Bat); <i>Merops ornatus</i> (Rainbow Bee-eater); <i>Pseudomys chapmani</i> (Western pebble-mound mouse) and <i>Notoscincus butleri</i> (Lined Soil-crevice Skink). No fauna species of conservation significance were recorded during the field survey (Rio Tinto, 2017).</p> <p>Four broad habitat types were recorded during the flora, vegetation and fauna habitat survey: loamy/stony plain, riverine, drainage line, low hills and slopes (Rio Tinto, 2017). These habitat types exist in the surrounding area and are not considered to be restricted at a local or regional scale (Rio Tinto, 2017). No significant microhabitats such as caves, gorges or permanent water pools were recorded (Rio Tinto, 2017).</p>

A.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12
Beard vegetation associations - State					
Veg Assoc No. 82	2,565,901.28	2,553,206.19	99.51	295,377.96	11.51
Veg Assoc No. 603	56,726.87	55,764.00	98.3	-	-
Veg Assoc No. 605	114,115.85	114,115.85	100	414.20	0.36
Veg Assoc No. 609	74,186.11	72,765.18	98.08	-	-
Beard vegetation associations - Bioregion					
Veg Assoc No. 82	2,563,583.23	2,550,888.14	99.50	295,377.96	11.52
Veg Assoc No. 603	56,726.87	55,764.00	98.30	-	-

Veg Assoc No. 605	114,115.85	114,115.85	100	414.20	0.36
Veg Assoc No. 609	74,186.11	72,765.18	98.08	-	-

Government of Western Australia (2019)

Appendix D. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy*. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition (Trudgen, 1991)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E. Vegetation Association Descriptions (Rio Tinto, 2017)

CLAYEY PLAINS

CcCAoTwTe/h

Corymbia candida low woodland over *Cassia* aff. *oligophylla* (thinly sericeous) low shrubland over *Triodia wiseana*, *Triodia epectia* open hummock grassland with patches of herbland. This vegetation unit has high conservation significance.

MESA TOPS AND HILLS

AiTWTsr

Acacia inaequilatera scattered tall shrubs over *Triodia wiseana*, *Triodia* sp. Robe River open hummock to hummock grassland. This vegetation unit has high conservation significance and is equivalent to Pilbara PEC 22.

AptAaTw

Acacia ptychophylla, *Acacia ancistrocarpa* x open heath over *Triodia wiseana* hummock grassland.

ChAiAbTw

Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Acacia bivenosa* scattered shrubs over *Triodia wiseana* hummock grassland.

EIAtenTwERIm

Eucalyptus leucophloia subsp. *leucophloia* scattered low trees over *Acacia tenuissima* shrubland over *Triodia wiseana* hummock grassland and *Eriachne mucronata* scattered tussock grasses. This vegetation unit has high conservation significance and is equivalent to 'Triodia sp. Robe River assemblages of mesas of the West Pilbara' PEC.

MESAS, HILLS AND SLOPES

AbTw

Acacia bivenosa open shrubland to open heath over *Triodia wiseana* hummock grassland.

DRAINAGE

ChAbGpTeCE

Corymbia hamersleyana low woodland over *Acacia bivenosa*, *Grevillea pyramidalis* high open shrubland over *Triodia epactia* hummock grassland and *Cenchrus* spp. open tussock grassland.

EcEvMgCYPvCEc

Eucalyptus camaldulensis, *Eucalyptus victrix* open forest over *Melaleuca glomerata* tall open scrub over *Cyperus vaginatus* open sedge land over *Cenchrus ciliaris* open tussock grassland.

MINOR CREEKLINE / FLOWLINES

ChAtuPITwTe

Corymbia hamersleyana low open woodland over *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* open scrub over *Triodia wiseana*, *Triodia epactia* hummock grassland.

CcTw

Corymbia candida low woodland over *Triodia wiseana* open hummock grassland.

ChAtuTwTe

Corymbia hamersleyana low open woodland over *Acacia tumida* var. *pilbarensis* tall open scrub over *Triodia wiseana*, *Triodia epactia* open hummock grassland.

ChAsppGOGsppPLScTeTw

Corymbia hamersleyana scattered low trees to low open woodland over *Acacia* spp., *Gossypium robinsonii*, *Grevillea* spp., *Petalostylis labicheoides*, *Stylobasium spathulatum* tall shrubland over *Triodia epactia*, *Triodia wiseana* hummock grassland.

MINOR DRAINAGE AREAS ON MESA TOPS AND EDGES

ChAtuTw

Corymbia hamersleyana scattered low trees over *Acacia tumida* var. *pilbarensis* tall open scrub over *Triodia wiseana* open hummock grassland. This vegetation unit has high conservation significance and is equivalent to 'Triodia sp. Robe River assemblages of mesas of the West Pilbara' PEC.

PLAINS

AxTw/AxTe

Mosaic of *Acacia xiphophylla* low woodland to tall shrubland over *Triodia wiseana* open hummock grassland and *Acacia xiphophylla* low woodland to tall shrubland over *Triodia epactia* open hummock grassland. This vegetation unit has high conservation significance.

AiAbTw

Mosaic of *Acacia xiphophylla* low woodland to tall shrubland over *Triodia wiseana* open hummock grassland and *Acacia xiphophylla* low woodland to tall shrubland over *Triodia epactia* open hummock grassland.

PLAINS AND LOW RISES

AxTwTe

Acacia xiphophylla tall open shrubland over *Triodia wiseana*, *Triodia epactia* very open hummock grassland.

ChAaAiTw/ChAtuPTaTe

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa*, *Acacia inaequilatera* scattered shrubs over *Triodia wiseana* hummock grassland / *Corymbia hamersleyana* scattered low trees over *Acacia tumida* closed heath over *Ptilotus astrolasius* low shrubland over *Triodia epactia* hummock grassland.

ChAaTw

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa* open shrubland to open heath over *Triodia wiseana* hummock grassland.

ChAaTwTe

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa* open shrubland to open heath over *Triodia wiseana*, *Triodia epactia* hummock grassland.

ChAaTwTe/AsyAscTe

Corymbia hamersleyana scattered low trees over *Acacia ancistrocarpa* open shrubland to open heath over *Triodia wiseana*, *Triodia epactia* hummock grassland / *Acacia synchronicia*, *Acacia sclerosperma* subsp. *sclerosperma* tall shrubland to tall open scrub over *Cassia oligophylla* x *helmsii* low open shrubland over *Triodia epactia* very open hummock grassland.

ChAiApyTe

Corymbia hamersleyana open woodland over *Acacia inaequilatera*, *Acacia pyrifolia* tall open shrubland over *Triodia epactia* hummock grassland.

ChAiTw

Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* scattered tall shrubs over mixed scattered shrubs over *Triodia wiseana* open hummock grassland.

STONY HILLS AND BREAKAWAYS**EIAiAptTw**

Eucalyptus leucophloia scattered low trees over *Acacia inaequilatera* scattered tall shrubs over *Acacia ptychophylla* low open shrubland over *Triodia wiseana* hummock grassland.

ERfTw

Eremophila fraseri open shrubland over *Triodia wiseana* hummock grassland.

STONY HILLS AND HIGH PLAINS**AiTWTspr**

Acacia inaequilatera scattered shrubs over *Triodia wiseana*, *Triodia* sp. Robe River hummock grassland. This vegetation unit has high conservation significance and is equivalent to 'Triodia sp. Robe River assemblages of mesas of the West Pilbara' PEC.

ChAbTw

Corymbia hamersleyana scattered low trees over *Acacia bivenosa* scattered shrubs over *Triodia wiseana* hummock grassland or *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa* open shrubland to open heath over *Triodia wiseana* hummock grassland.

ChAiTwTspr

Corymbia hamersleyana scattered low trees over *Acacia inaequilatera* open shrubland over *Triodia wiseana*, *Triodia* sp. Robe River hummock grassland. This vegetation unit has high conservation significance and is equivalent to Pilbara PEC 22.

EIAiAbTw

Eucalyptus leucophloia scattered low trees over *Acacia inaequilatera*, *Acacia bivenosa* scattered tall shrubs over *Triodia wiseana* hummock grassland.

STONY PLAINS**AatAbTw**

Acacia atkinsiana tall open shrubland over *Acacia bivenosa* open shrubland over *Triodia wiseana* hummock grassland.

AiAaAbTw

Acacia inaequilatera scattered tall shrubs over *Acacia ancistrocarpa*, *Acacia bivenosa* open shrubland to shrubland over *Triodia wiseana* hummock grassland.

CcAaAbAsyTeTw

Corymbia candida scattered low trees over *Acacia ancistrocarpa*, *Acacia bivenosa*, *Acacia synchronicia* open shrubland over *Triodia epactia*, *Triodia wiseana* hummock grassland.

STONY PLAINS, HILLS AND RIDGES**ChAbTwTe**

Corymbia hamersleyana low woodland over *Acacia bivenosa* shrubland over *Triodia epactia*, *Triodia wiseana* mid-dense hummock grassland or *Corymbia hamersleyana* scattered low trees to low woodland over *Acacia bivenosa* open shrubland over *Triodia wiseana*, *Triodia epactia* hummock grassland.

VALLEY FLOORS AND LOW PLAINS**AsciAsyTe**

Acacia sclerosperma, *Acacia synchronicia* open shrubland over *Triodia epactia* hummock grassland.

AsyTeCEs

Acacia synchronicia tall open shrubland over *Triodia epactia* hummock grassland over *Cenchrus setiger* open tussock grassland.

Further flora surveys have been conducted over the original and additional areas with the latest conducted in July and October 2013. The following vegetation units have been mapped within the amended permit boundary (Rio Tinto, 2014):

VEGETATION OF LOW HILLS AND RISES

AbTw: *Acacia bivenosa* and *Acacia ptychophylla* scattered low shrubs over *Triodia wiseana* hummock grassland;

AiAptTw: *Acacia inaequilatera* scattered shrubs over *A. ptychophylla* low open shrubland over *Triodia wiseana* hummock grassland;

ChAaAiTw/ChAtuTe: *Corymbia hamersleyana* scattered low trees over *Acacia* sp. scattered shrubs over *Triodia wiseana* hummock grassland / *Corymbia hamersleyana* low open woodland over *Acacia tumida* tall closed scrub over *Triodia epactia* hummock grassland;

ChAiTw: *Corymbia hamersleyana* scattered low trees over *Acacia inaequilatera*, *Acacia ancistrocarpa* and *Acacia bivenosa* scattered shrubs over *Triodia wiseana* (and *Triodia epactia*) hummock grassland;

EiIGwAptTw: *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* scattered low trees over *Grevillea wickhamii* and *Acacia inaequilatera* scattered shrubs over *Acacia ptychophylla* scattered low shrubs over *Triodia wiseana* and *Triodia* sp. Robe River (M.E. Trudgen et al. MET 12367) hummock grassland;

VEGETATION OF PLAINS

ChAiTe: *Corymbia hamersleyana* scattered trees over *Acacia inaequilatera* scattered tall shrubs over *Triodia epactia* hummock grassland;

ChAsyAbTe: *Corymbia hamersleyana* scattered trees over *Acacia synchronicia*, *A. bivenosa* tall shrubland over *Triodia epactia* hummock grassland;

CaAsAbTeCs: *Corymbia hamersleyana* scattered trees over *Acacia synchronicia*, *A. bivenosa* tall shrubland over *Triodia epactia* hummock grassland;

AxTe: *Acacia xiphophylla* low open woodland over *Triodia epactia* open hummock grassland;

VEGETATION OF DRAINAGE

EcEvTYdCYPv: *Eucalyptus camaldulensis*, *E. victrix* scattered tall trees over *Typha domingensis*, *Cyperus vaginatus* very open sedgeland;

EvApyAtrTe: *Eucalyptus victrix* scattered low trees over *Acacia pyrifolia*, *A. trachycarpa* open shrubland over *Triodia epactia* open hummock grassland;

ExAsciCYPvCEcTe: *Eucalyptus xerothermica* open woodland over *Acacia sclerosperma* tall open scrub over *Cyperus vaginatus* very open sedgeland over **Cenchrus ciliaris* open tussock grassland over *Triodia epactia* very open hummock grassland;

MgTI: *Melaleuca glomerata* and *Acacia bivenosa* scattered shrubs over *Triodia longiceps* hummock grassland;

Mosaic: Mosaic of vegetation within a seasonally waterlogged plain;

CLEARED AND HEAVILY DISTURBED AREAS

CD: Completely Degraded.

Appendix H. Sources of information

H.1. GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

H.2. References

- BoM (2022) Bureau of Meteorology Website - Climate statistics for Australian locations, Onslow. Available online at: http://www.bom.gov.au/climate/averages/tables/cw_005016.shtml. Accessed on 10 November 2022
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management, Western Australia
- Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 22 November 2022).
- Department of Water (2012) Bungaroo Creek Water Reserve drinking water source protection plan. *West Pilbara water supply scheme*. Report WRP 135. November 2012, Western Australia. Available from: <https://www.wa.gov.au/system/files/2022-04/Bungaroo-Creek-Water-Reserve-drinking-water-source-protection-plan-WRP-135.pdf>
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.pdf
- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Rio Tinto (2017) Flora, Vegetation and Fauna Habitat Assessment at Jimmawurrada, Native Vegetation Clearing Permit Supporting Report (RTIO-HSE-0306769). Rio Tinto Iron Ore, May 2017.
- Trudgen, M.E. (1991) Vegetation condition scale in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P. and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 29 November 2022).

4. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
BoM	Bureau of Meteorology, Australian Government
CAWS Act	<i>Country Areas Water Supply Act 1947</i> , Western Australia
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T **Threatened species:**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species:

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories

are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 Priority One - Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 Priority Two - Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 Priority Three - Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 Priority Four - Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.
- (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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.