Government of Western Australia
Department of Mines, Industry Regulation and Safety

Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9751/1
Permit type:	Purpose Permit
Applicant name:	Hamersley Resources Limited
Application received:	24 May 2022
Application area:	1,500 hectares
Purpose of clearing:	Mineral exploration, hydrogeological and geotechnical investigations, camp and associated activities
Method of clearing:	Mechanical Removal
Tenure:	*Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4192 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4266 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4267 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4737 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4881 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4882 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4883 *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*, Temporary Reserve 70/4884
Location (LGA area/s):	Shire of East Pilbara
Colloquial name:	Rhodes Ridge Project

1.2. Description of clearing activities

Hamersley Resources Limited proposes to clear up to 1,500 hectares of native vegetation within a boundary of approximately 42,823 hectares, for the purpose of mineral exploration, hydrogeological investigations, camp and associated infrastructure. The project is located approximately 32 kilometres north-west of Newman, within the Shire of East Pilbara.

The application is to allow for exploration activities at the Rhodes Ridge project.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	1 September 2023
Decision area:	1,500 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 17 June 2022. DMIRS advertised the application for a public comment period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix F), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey (Appendix E), the clearing principles set out in Schedule 5 of the EP Act (Glossary), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- impacts to conservation significant flora;
- impacts to priority ecological communities;
- Impacts to potential groundwater dependant ecosytems;
- Impacts to conservation signficant fauna; and
- An increase in cumulative impacts from clearing in the area

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- avoid areas of significant vegetation including priority ecological communities and caves;
- restrict the clearing within significant fauna habitats;
- avoiding the clearing of priority 1 and 2 flora species and limit the clearing of priority 3 and 4 species to 15% of the population within the application area;
- have a fauna spotter to alert operators while undertaking clearing activities;
- retain cleared vegetation and respread over cleared areas following completion of exploration activities.

1.5. Site map

A site map of proposed clearing is provided in Figure 1 below.

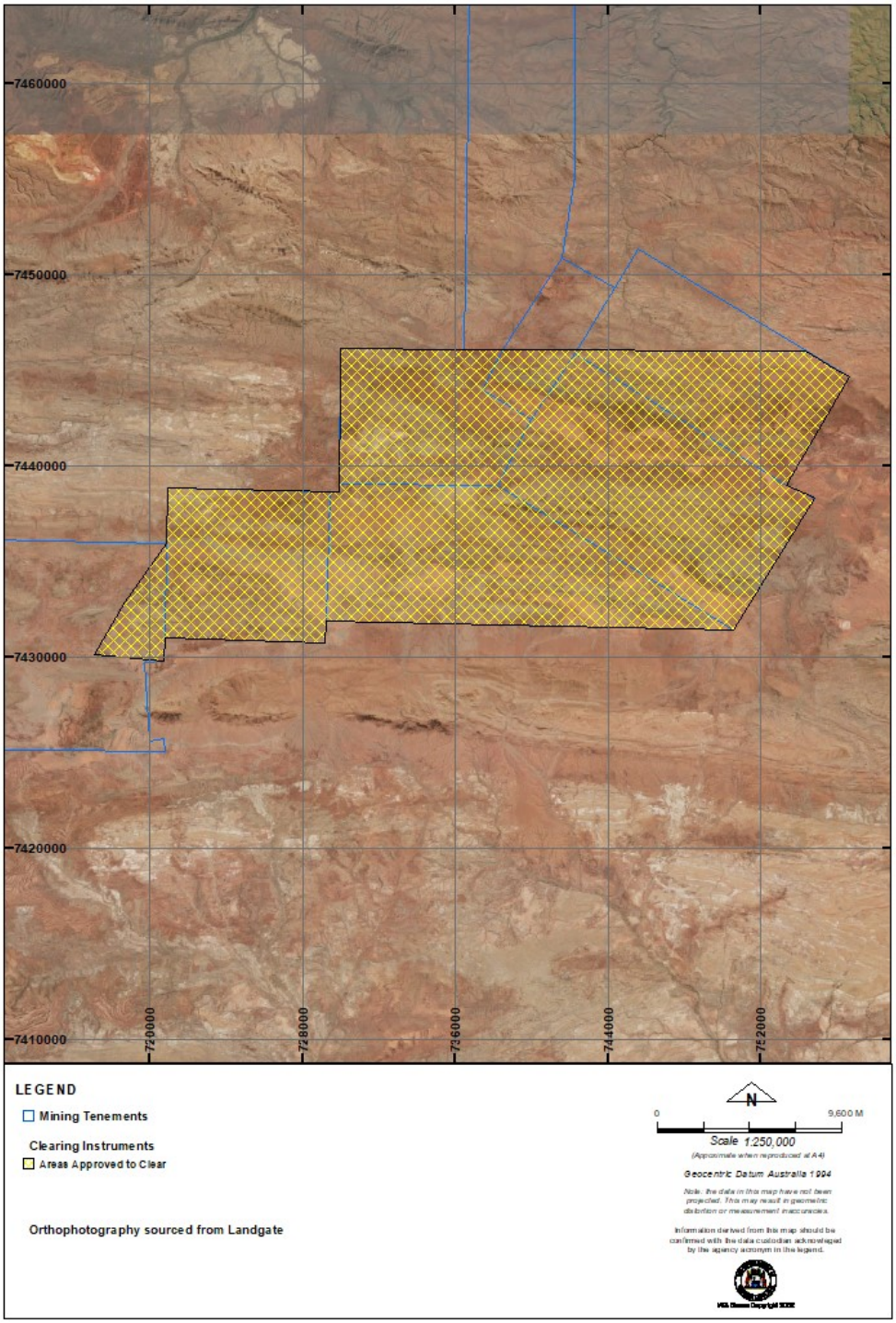

Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

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)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)
- *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972*

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, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values. Existing tracks will be used where possible to minimise clearing. The applicant has committed to avoiding areas associated with priority ecological communities and potential groundwater dependent ecosystems. Caves and adits which have the potential to be utilised by conservation significant fauna species including Ghost Bat, Pilbara Leaf-nosed Bat, Northern Quoll and Pilbara Olive Python will also be avoided.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (fauna, flora and vegetation). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora and vegetation) - Clearing Principle (a)

Assessment

Vegetation

There has been 37 vegetation units mapped within the application area (Astron, 2022). None of the vegetation units have been identified as a Threatened Ecological Community (TEC) (Astron, 2022). There are vegetation units within the application area which may represent two Priority Ecological Communities (PECs) (Astron, 2022).

Vegetation unit P15 is considered to be analogous to the 'West Angelas cracking-clays' PEC (Astron, 2022). Threats to this PEC include clearing for mining activities (DBCA, 2023). This vegetation unit was mapped in numerous small areas ranging in size from <0.1 hectares to 6.6 hectares (Astron, 2022). In total there was approximately 76.1 hectares of this PEC mapped within the application area. Vegetation units P5, P13 and P16 often occur in association with P15 on the same crab-hole/cracking clay soils however, they were not considered to be representative of the PEC (Astron, 2022).

Vegetation unit D12 has been identified as having an affinity to the 'Coolibah-lignum flats: *Eucalyptus victrix* over lignum community in the Pilbara (Coolibah and mulga (*Acacia aneura*) woodland over lignum and tussock grasses on clay plains (Coondewanna Flats and Wanna Munna Flats) subtype)' PEC (Astron, 2022). This vegetation unit was recorded in three discrete patches totalling approximately 11.9 hectares (Astron, 2022).

Whilst not listed as a TEC/PEC, vegetation unit D19 may be of elevated significance as it is uncommon with a limited distribution, and supports all of the known occurrences of the Priority 1 flora species *Paranotis* sp. Pilbara (H. Ajduk HAOP04a) (Astron, 2022). This vegetation unit occurs in a drainage line and is characterised by *Eremophila galeata* which is at the northern extent of its distribution in the application area (Rio Tinto, 2022).

Vegetation unit P1 represents a banded mulga community, which has been previously identified as an ecosystem at risk (CALM, 2002). This community is susceptible to changes in hydrology resulting from linear infrastructure causing water shadowing of the community. The hard pan mulga communities of P8, P9 and P8/P9 are also heavily reliant on sheet flow and are susceptible to hydrological changes (Astron, 2022). These communities are well represented in the application area, together making up over 30% of the application area (Astron, 2022). Whilst the proposed clearing is not likely to represent a significant impact on these communities, clearing should be minimised and tracks constructed to minimise any impacts on natural surface drainage patterns.

Rio Tinto (2022) has committed to not undertaking any new exploration or associated activities within vegetation units D12, D19 and P15. The only activities within this vegetation units will be the maintenance of existing cleared areas.

Flora

There have been numerous flora surveys and targeted searches undertaken within the application area. Since 2019 there has been 36 surveys undertaken within the application area (Rio Tinto, 2023). There were 563 confirmed vascular flora taxa, from 60 families and 196 genera, recorded in the survey area (Astron, 2022). There were no species of Threatened flora recorded within the application area (Astron, 2022; GIS Database). The March 2021 survey recorded a total of 21 priority flora species within the application area (Astron, 2022). There are a further six priority flora species which are known from the application area (Rio Tinto, 2022). There were five of these species (*Eragrostis* sp. Mt Robinson, *Teucrium pilbaranum*, *Dolichocarpa* sp. Hamersley Station, *Euphorbia australis* var. *glabra* and *Glycine falcata*) which were also considered to be range extensions (Rio Tinto, 2022).

The numbers of individuals recorded in the application area range from 1 individual to over 47,000 individuals (Rio Tinto, 2023). The proposed clearing of 1,500 hectares has the potential to have significant impacts on some species at a local and regional level. The regional area was defined as records within 200 kilometres of the application area (Rio Tinto, 2023). Many species are well represented outside of the application area however, for some species there is a high proportion of the known local records within the application area. This makes these species more susceptible to impacts from cumulative impacts.

Several of the priority flora species recorded are located within the D12, D19 and P15 vegetation units. Therefore, the proposed avoidance of clearing these vegetation units will also avoid clearing the priority flora present. Some species were wholly recorded within these communities and will not be impacted by the proposed clearing.

An assessment on the potential impact on each priority flora species has been undertaken based on the following criteria (Rio Tinto, 2023):

Risk Rating	Criteria
Negligible	100% of known records within the application area are within proposed exclusion areas and are not proposed to be impacted.
Low	At least 50% of known regional records for the species are present outside of the application area. OR At least 50% of known local records are within proposed exclusion areas.
Moderate	Greater than 50% of known regional records for the species are present within the application area AND Less than 50% of known local records are within proposed exclusion area
High	Any impact to Priority 1 species OR greater than 5% of local records of Priority 2 species OR greater than 15% of records for Priority 3 and Priority 4 species.

The species below were identified as having as having a negligible risk from the proposed clearing:

Species	No. within application area	No. individuals proposed to be cleared	No. within exclusion areas	% of individuals within exclusion areas	No. individuals (regional extent) on RTIO database	% of total individuals within application area
Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP1479)	428	0	428	100	6,199	7
Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)	2	0	2	100	32	6
Euphorbia inappendiculata var. *inappendiculata*	1,034	0	1,034	100	1,171	88

Ipomoea racemigera	1	0	1	100	517	<1
Isotropis parviflora	29	0	29	100	6,548	<1
Oxalis sp. Pilbara (M.E. Trudgen 12725)	4	0	4	100	590	1
Paranotis sp. Pilbara (H. Ajduk HAOP04a)	15,983	0	15,983	100	19,875	80
Streptoglossa sp. Cracking clays (S. van Leeuwen et al. PBS 7353)	3	0	3	100	1,532	<1
Swainsona thompsoniana	113	0	113	100	654	17
Teucrium pilbaranum	1	0	1	100	1	100

The species below were identified as having a low risk from the proposed clearing:

Species	No. within application area	No. individuals proposed to be cleared	No. within exclusion areas	% of individuals within exclusion areas	No. individuals (regional extent) on RTIO database	% of total individuals within application area
Acacia bromilowiana	1	0	0	0	3,225	<1
Acacia subtiliformis	22,507	3,217	5	0.02	151,286	15
Aristida lazaridis	2,179	50	1,659	76.14	17,287	13
Glycine falcata	58	0	57	98.28	15,805	<1
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	83	0	53	63.86	78,470	<1
Grevillea saxicola	1	0	0	0	4,298	<1
Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708)	340	0	328	96.47	5,395	6
Indigofera gilesii	4,067	12	2,060	50.65	7,916	51
Lepidium catapycnon	1,879	0	0	0	33,331	6
Rostellularia adscendens var. *latifolia*	100	0	50	50	4,534	2
Sida sp. Hamersley Range (K. Newbey 10692) (tentative ID)	1	0	0	0	1,532	<1
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	2,620	29	221	8.44	98,543	3
Triodia sp. Mt Ella (M.E. Trudgen 12739)	3,440	0	1,180	34.3	162,515	2
Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)	1	0	0	0	13,269	<1

As noted above, of the species identified as having a low risk from the clearing, *Acacia bromilowiana, Glycine falcata, Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727), *Rostellularia adscendens* var. *latifolia, Sida* sp. Hamersley Range (K. Newbey 10692) (tentative ID), *Themeda* sp. Hamersley Station (M.E. Trudgen 11431), *Triodia* sp. Mt Ella (M.E. Trudgen 12739) and *Vittadinia* sp. Coondewanna Flats (S. van Leeuwen 4684) all have less than 5% of the recorded regional population within the application area (Rio Tinto, 2023). Based on the proposed activities, only 29 individuals of *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) are proposed to be cleared from these species. *Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen MET 15708) has 6% of its regional population within the application area however, over 96% of the individuals are within proposed exclusion areas.

Aristida lazaridis also has a high proportion of the records (over 76%) within the application area located in proposed exclusion areas. This is the only Priority 2 species proposed to be cleared during clearing proposed for this application (Rio Tinto, 2023). It is estimated that 50 individuals will be impacted which represents 2.29% of the population (Rio Tinto, 2023). This species has been recorded in significant numbers in the local region (over 17,000 individuals) and the clearing of 50 plants is not likely to have a significant impact on this species.

Indigofera gilesii has over 50% of the regional population within the application area however, over 50% is also located within the proposed exclusion areas (Rio Tinto, 2023). There are records of *Indigofera gilesii* in close proximity to the application area both north and south (Rio Tinto, 2023). The records within the proposed exclusion areas are also across a broad area of the application area so the proposed clearing is not expected to significantly impact on the area of occupancy and connectivity of the local population.

Acacia subtiliformis has approximately 15% of the regional population within the application area, with very few records located within proposed exclusion areas. Regionally this species has a distribution of approximately 130 kilometres (GIS Database). To date there has been approximately 14% of the records within the application cleared however, this number may be inflated due to the method the original data was collected (Rio Tinto, 2023). Single points representing 3,000 individuals have been previously cleared for a track and powerline and it is unlikely that the total 3,000 individuals were cleared at this location (Rio Tinto, 2023). Further surveys are proposed to confirm the exact numbers of *Acacia subtiliformis* which were cleared at this location. This species was recorded from a range of vegetation units and but was clustered in areas on calcrete (Astron, 2022; Rio Tinto, 2023). Areas of calcrete are not specifically targeted in iron ore exploration and it is not anticipated that significant numbers of this species will be cleared (Rio Tinto, 2023).

The species below were identified as having a moderate risk from the proposed clearing:

Species	No. within application area	No. individuals proposed to be cleared	No. within exclusion areas	% of individuals within exclusion areas	No. individuals (regional extent) on RTIO database	% of total individuals within application area
Aristida jerichoensis var. *subspinulifera*	5,847	549	433	7.41	9,708	60
Euphorbia australis var. *glabra*	792	1	364	45.96	836	95
Rhagodia sp. Hamersley (M. Trudgen 17794)	47,058	2,138	511	1.09	58,876	80

Aristida jerichoensis var. *subspinulifera* has over 60% of the regional population recorded within the application area with a low percentage within the proposed exclusion areas (Rio Tinto, 2023). This species is distributed across mainland Australia and has a wide distribution within the Pilbara of over 300 kilometres from west of Karijini National Park to east of Newman (Australasian Virtual Herbarium, 2023; GIS Database). Several of the records of this species are from areas which have been disturbed in 2021 and 2022 which may indicate that this species responds to disturbance (Rio Tinto, 2023). Given the wide distribution of this species, the proposed clearing is not likely to impact on the area of occupancy of this species.

Euphorbia australis var. *glabra* has a very high proportion of the regional population within the application area. There is a significant number of individuals (over 45%) within the proposed exclusion areas (Rio Tinto, 2023). This species have a range of over 470 kilometres however, the records within the application area are located at the southern extent of the range of this species and represent a range extension for this species (Astron, 2022; Rio Tinto, 2023; GIS Database). The records within the proposed exclusion areas are well distributed across the application area so the proposed clearing is not likely to impact on the connectivity of this subpopulation or reduce the overall area of occupancy.

Rhagodia sp. Hamersley (M. Trudgen 17794) was recorded in significant numbers within the application area however, there is approximately 80% of the regional extent within the application area (Rio Tinto, 2023). This species was recorded over a broad distribution of vegetation units across the application area (Astron, 2022). This vegetation is also well represented outside of the application area. It has a distribution of over 340 kilometres from west of Karijini National Park to east of Newman (GIS Database). Given the abundance of individuals that have been recorded to date, it is likely that further surveys will locate significant numbers of individuals within and outside of the application area. The proposed clearing activities are estimated to clear approximately 4.5% of the individuals within the application area. Given the frequency and distribution of this species within the application area, the proposed clearing is not likely to impact on the extent of occupancy or genetic connectivity of this species.

No species were identified as having a high risk from the proposed clearing.

Cumulative impacts

There are five other clearing permits which have already been approved which overlap within the current application area:

Permit number	Approved clearing	End of clearing date
2283/6	355	31 December 2022
3169/3	22	31 July 2019
8245/1	200	23 February 2029
8270/1	600	31 December 2028
8771/1	805	31 December 2025

Permits 3169/3, 8245/1 and 8771/1 are entirely located within the application area. Permit 2283/6 extends outside the application area to the south and 8270/1 spans a much larger area of over 82,000 which includes the application area. Therefore, including this application, there will be at least 2,322 hectares of approved clearing within the application area (with a potential maximum of 3,277 hectares if all clearing of overlapping permits is undertaken in the area). Given the amount of clearing within the area there is the potential for there to be significant impacts on flora and vegetation within the application

area. The numbers of individuals proposed to be cleared listed in the tables above includes individuals already cleared or approved to be cleared under existing permits covering the application area (Rio Tinto, 2023). The applicant has committed to avoiding Priority 1 flora species and not clearing more than 5% of Priority 2 flora species and 15% of Priority 3 and 4 flora species (Rio Tinto, 2023). The more restricted vegetation units and fauna habitats are also proposed to be avoided.

The restriction of clearing to a percentage of individuals only considers overall abundance and does not consider how the clearing may affect other species attributes such as the extent of occurrence, area of occupancy and genetic and functional connectivity (DBCA, 2023). Where species have a high proportion of their regional extent within the application area, increased clearing has the potential to have more significant impacts on the local population.

Weeds
Numerous weed species were recorded within the application area during the flora survey (Rio Tinto, 2023). No Declared Pests sectioned under the *Biosecurity and Agriculture Management Act 2007* or Weeds of National Significance were recorded within the application area (Rio Tinto, 2023). Weeds have the potential to out-compete native species and reduce the biodiversity of an area, and care should be taken to prevent the introduction and spread of weeds to the application area and surrounding areas. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by implementing a weed management condition.

Conclusion
Based on the above assessment, the proposed clearing will result in impacts to the Coolibah-lignum flats: *Eucalyptus victrix* over lignum community in the Pilbara (Coolibah and mulga (*Acacia aneura*) woodland over lignum and tussock grasses on clay plains (Coondewanna Flats and Wanna Munna Flats) subtype PEC, and several conservation significant flora.

For the reasons set out above, it is considered that the impacts of the proposed clearing to conservation significant flora and the PEC can be managed by the conditions set out below.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- A flora management condition which requires no clearing of Threatened flora, or Priority 1 and 2 flora species, and restrictions on the amount of Priority 3 and 4 species that can be cleared.
- Restricted clearing within the PEC, except for maintenance clearing of existing access tracks.
- The rehabilitation of areas no longer required within 12 months of clearing native vegetation to ensure habitats are not permanently lost.
- Take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.2. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment

There were eight broad fauna habitats identified within the application area (Astron, 2022):

- Low hills and slopes
- Clay plain
- Mulga woodland
- Stony plain
- Rocky hill
- Minor drainage
- Gorge/gully
- Breakaway

The low hills and slopes habitat was the most abundant habitat covering approximately 40.4% of the application area (Astron, 2022). This habitat generally has a low vegetation complexity and low diversity of microhabitats for fauna species (Astron, 2022). The mulga woodland and clay plain habitats are also well represented covering 25.2% and 20.5% of the application area respectively (Astron, 2022). These habitats provide more areas of shelter for fauna that the low hills and slopes habitat however, both are also common in the local area and not likely to represent significant fauna habitat.

The stony plain and rocky hill habitat are less common within the application area however, are both considered to be common in the local area (Astron, 2022). The stony plain habitat is likely to be of low value for fauna due to the low diversity of vegetation and microhabitats (Astron, 2022). The rocky hill habitat also has a low diversity of vegetation and microhabitats however, it may be utilised by conservation significant species such as Northern Quoll, Western Pebble-mound Mouse, Pilbara Barking Gecko and *Anilios ganei* (Astron, 2022).

The minor drainage, gorge/gully and breakaway habitats are the most restricted habitats within the application area and have the highest value to fauna species (Astron, 2022). The minor drainage habitat has a moderate diversity of microhabitats with some tree hollows and woody debris which provides foraging and shelter for ground dwelling fauna (Astron, 2022). The linear nature of the habitat also means that it is likely to be utilised by fauna traversing across the landscape. There was a semi-permanent waterbody located within this habitat (Astron, 2022). This feature is important for local fauna species and is likely to be utilised by several species of conservation significant fauna such as Pilbara Olive Python and Ghost Bats.

The gorge/gully habitat have the potential to be important shelter or roosting habitat for conservation significant species such as Pilbara Olive Python, Ghost Bat, Pilbara Leaf-nosed Bat, Northern Quoll and *Anilios ganei* (Astron, 2022). This habitat contains a complexity of microhabitats and the occasional deep caves and semi-permanent rock pools can provide refuge for fauna during drier seasonal conditions (Astron, 2022).

The breakaway habitat was the most restricted habitat within the application area (126.6 hectares mapped) and was often associated with the drop off areas of the rocky hill habitat (Astron, 2022). This habitat contains a number of microhabitats such as crevices, overhangs and shallow caves that provide shelter opportunities for conservation significant species such as Pilbara Olive Python, Ghost Bat, Pilbara Leaf-nosed Bat and Northern Quoll (Astron, 2022). In particular the caves have the potential to be used as diurnal roost and nocturnal feeding roosts for the Ghost Bat and as potential den sites for the Northern Quoll and Pilbara Olive Python (Astron, 2022). Both the gorge/gully and breakaway habitats were considered to be of high importance for fauna within the application area (Astron, 2022).

Within the application area there are six abandoned mine adits which monitoring studies have shown are being utilised by Ghost Bats and Pilbara Leaf-nosed Bats (Astron, 2022). The monitoring has found that five of the adits are regularly being used as diurnal roosts by Ghost Bats and three are occasionally being used by Pilbara Leaf-nosed Bats (Astron, 2022). The applicant has committed to avoiding these adits with a 150 metre buffer (Rio Tinto, 2022).

One-hundred and eighty-three fauna species, comprising four amphibians, 70 reptiles, 80 birds and 29 mammals were recorded within the survey area. Following the fauna survey, the following species of conservation significance were either recorded within the application area or considered likely to occur:

- Gane's Blind Snake (Pilbara)
- Ghost Bat
- Grey Falcon
- *Lerista macropisthopus remota*
- Letter-winged Kite
- Northern Quoll
- Pilbara Barking Gecko
- Pilbara Leaf-nosed Bat
- Pilbara Olive Python
- Western Pebble-mound Mouse

The Ghost Bat has been recorded within the application area from ultrasonic calls, scats within caves and one individual sighted in a diurnal roosting caves (Astron, 2022). The gorge/gully and breakaway habitat are significant for this species as they support suitable crevices and roost sites. A recent review of Ghost Bat ecology, threats and survey requirements categorised Ghost Bat roost into the following categories (Bat Call WA, 2019):

- Category 1: maternity/diurnal roost sites with permanent occupancy;
- Category 2: maternity/diurnal roost caves with regular occupancy;
- Category 3: diurnal roost caves with occasional occupancy; and
- Category 4: nocturnal roost caves with opportunistic usage.

Within the application area there has been 6 Ghost Bat roosts recorded comprising of one Category 3 cave, and five Category 4 roosts (Astron, 2022). Isolated Category 3 caves are not considered critical habitat essential to the long term viability of a local population however, they may enable the long distance movement of individuals across a landscape (Bat Call WA, 2019). Category 4 roost caves are only used opportunistically by Ghost Bats and not considered to be critical habitat for this species. The applicant has committed to avoiding all of the Ghost Bat roosts within the application with a 25 metre buffer (Rio Tinto, 2022).

The Northern Quoll has not been recorded within the application area but has been previously recorded in the greater Rhodes Ridge locality (Astron, 2022). The gorge/gully and breakaway habitats are important habitat for the Northern Quoll as they provide denning sites for breeding, shelter and diverse microhabitats for foraging (Astron, 2022). They are also likely to forage and disperse within the minor drainage and rocky hill habitats. Given they are known from the local area and there is suitable habitat present, it is considered likely that Northern Quoll is present within the application area.

The Pilbara Leaf-nosed Bat was not recorded within the application area during the most recent fauna survey but has been previously recorded in three adits within the application area (Astron, 2022). No permanent roosts for this species are known from the application area however, it is likely to utilise the vegetation within the application for foraging activities (Astron, 2022). This species is wide ranging and likely to forage within the low hills and slopes, rocky hill, mulga woodland and minor drainage lines habitats (Astron, 2022).

There are historical records of the Pilbara Olive Python within the application area and it has been recorded within the greater Rhodes Ridge area from direct observation, motion camera and recent skin shed (Astron, 2022). This species is likely to be found at low densities within the gorge/gully, breakaway and minor drainage habitats within the application area. In particular, areas that have the potential to support semi-permanent water are important for this species.

As outlined above, the gorge/gully and breakaway habitats are likely to represent significant habitat for the Ghost Bat, Pilbara Leaf-nosed Bat, Northern Quoll and Pilbara Olive Python. Areas of semi-permanent water are also likely to be significant for these species. The clearing of these habitats has the potential to have significant impacts on these species and should be avoided (DBCA, 2022). The applicant has committed to avoiding all known roosting caves, adits and recorded semi-permanent water holes. Clearing of the gorge/gully and breakaway habitat will also be restricted to access tracks where there are no other alternative passages.

The Western Pebble-mound Mouse was recorded within the application area from the presence of pebble-mounds (26 active, seven inactive) (Astron, 2022). These were primarily from the low hills habitat with other mounds also recorded within the rocky hill and stony plains habitats (Astron, 2022). Suitable habitat was widespread throughout the application area and is also common in the local area (Astron, 2022). The proposed clearing is not likely to have a significant impact on this species.

The other species of conservation significance considered likely to occur within the application area are found within habitats which were not restricted and common within the local area. Therefore, it is considered that the proposed clearing is not likely to have a significant impact on these species.

Conclusion
Based on the above assessment, the proposed clearing will result in some impact to conservation significant fauna.

For the reasons set out above, it is considered that the impacts of the proposed clearing to conservation significant fauna can be managed by the conditions listed below.

The applicant may have notification responsibilities under the EPBC Act for impacts to Ghost Bat, Pilbara Leaf-nosed Bat, Northern Quoll, Pilbara Olive Python and their habitats, as set out in the EPBC Act. The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

Conditions
To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Slow directional clearing to allow fauna to move into adjacent vegetation ahead of the clearing activity will minimise impact to individuals
- The rehabilitation of areas no longer required within 12 months of clearing native vegetation to ensure faunal habitats are not permanently lost.
- Restricted clearing within gorge/gully and breakaway habitat, where clearing can only occur for access tracks (where there are no other alternative passages).

3.3. Relevant planning instruments and other matters

The clearing permit application application was advertised on 17 June 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 are two native title claims over the area under application (DPLH, 2023). These claims have been determined by the Federal Court on behalf of the claimant groups. 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, 2023). 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. Additional information provided by applicant

Summary of comments	Consideration of comment
Additional information that included updated flora survey information and assessment of the risk of the proposed clearing on priority flora species.	The information was incorporated into the assessment.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	The project is located approximately 32.5 kilometres north-west of Newman. The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia.
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages.
Conservation areas	The closest conservation area is the former Juna Downs Pastoral Lease which is located approximately 36 kilometres northwest of the application area.
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations: 18: Low woodland; mulga (*Acacia aneura*); 29: Sparse low woodland; mulga, discontinuous in scattered groups; 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana;* and 175: Short bunch grassland - savanna/grass plain (Pilbara). There have been numerous flora surveys and targeted searches undertaken within the application area. Between June 2019 and October 2021 there has been over 20 surveys undertaken within the application area. Based on these survey efforts, the following vegetation associations were recorded within the application area (Astron, 2022): **D1:** *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees to low open woodland over *Acacia tumida* var. *pilbarensis*, *Petalostylis labicheoides* and *Grevillea wickhamii* subsp. *hispidula* tall open shrubland to tall open scrub over *Androcalva luteiflora, Acacia maitlandii* and *Santalum lanceolatum* scattered shrubs to shrubland over (*Tephrosia rosea* var. Fortescue creeks (M.I.H. Brooker 2186) and/or *Indigofera fractiflexa* subsp. *fractiflexa* scattered low shrubs to low open heath over) *Triodia pungens* very open hummock grassland to open hummock grassland over *Themeda triandra* (*Eriachne mucronata* and *Paraneurachne muelleri*) scattered tussock grasses to open tussock grassland. **D2:** *Eucalyptus xerothermica* scattered low trees to low open woodland over *Acacia aptaneura*, *A. catenulata* subsp. *occidentalis* and/or *A. citrinoviridis* tall shrubland to tall open scrub over *Petalostylis labicheoides* (and other species) scattered low shrubs to open shrubland over *Triodia pungens* very open hummock grassland over *Chrysopogon fallax* scattered tussock grasses to very open tussock grassland. **D4:** *Eucalyptus camaldulensis* subsp. *refulgens* and *E. victrix* low open woodland to woodland over *Petalostylis labicheoides*, *Acacia citrinoviridis* and *Gossypium robinsonii* scattered tall shrubs to tall shrubland over *G. sturtianum* var. *sturtianum* (and *Androcalva luteiflora*) scattered shrubs to open shrubland over (*Triodia longiceps* and/or *T. pungens* scattered hummock grasses to very open hummock grassland over) *Themeda triandra, Eulalia aurea* and *Eriachne tenuiculmis* open tussock grassland with *Eragrostis tenellula* scattered annual grasses to very open annual grassland; **D5:** *Eucalyptus xerothermica* (and *Corymbia hamersleyana*) low open woodland over *Petalostylis labicheoides, Eremophila longiflora* and *Androcalva luteiflora* tall open shrubland to tall shrubland over *Senna artemisioides* subsp. x *artemisioides, Gossypium sturtianum* var. *sturtianum* and *Santalum lanceolatum* scattered shrubs to open shrubland over *Triodia pungens, T. longiceps* and/or *T. wiseana* scattered hummock grasses to open hummock grassland over *Themeda triandra, Eulalia aurea* and *Chrysopogon fallax* tussock grassland (over *Eragrostis cumingii, Digitaria ctenantha* and/or *Perotis rara* scattered annual grasses to open annual grassland with *Arivela viscosa* and **Bidens bipinnata* scattered herbs to very open herbland); **D8:** *Eucalyptus xerothermica* low open woodland over *Acacia aptaneura, A. catenulata* subsp. *occidentalis* and other *Acacia* spp. scattered tall shrubs to tall shrubland over (*Dipteracanthus*

Characteristic	Details
	australasicus subsp. *australasicus*, *Ptilotus obovatus* var. *obovatus* and or other species low open shrubland over) *Themeda triandra* (*Eulalia aurea* and *Paraneurachne muelleri*) tussock grassland; **D12:** *Eucalyptus victrix* open woodland over *Acacia aptaneura* scattered tall shrubs to tall open shrubland over *Duma florulenta* (and *Rhagodia eremaea*) open shrubland to shrubland over *Chrysopogon fallax, Eriachne flaccida, Eulalia aurea* and/or other species very open tussock grassland with *Urochloa occidentalis* var. *ciliata, Digitaria ctenantha* and *Enneapogon polyphyllus* annual grassland on broad drainage depressions within crabhole clay plains. May represent 'Coolibah – Lignum Flats: sub type 1' priority 3 PEC; **D13:** *Eucalyptus victrix* open woodland over *Eulalia aurea* and *Eriachne flaccida* closed tussock grassland on soak/drainage depression areas where there is seasonal inundation within a clay plain; **D15:** *Eucalyptus xerothermica* scattered low trees to open woodland over *E. socialis* subsp. *eucentrica* and/or *E. trivalva* low open mallee woodland over *Acacia steedmanii* subsp. *borealis*, *A. bivenosa* and other species tall open shrubland over *Triodia angusta* and/or *T. wiseana* very open hummock grassland to open hummock grassland with *Themeda triandra* open tussock grassland; **D19:** *Acacia aptaneura, A. citrinoviridis* and *Eremophila galeata* tall open shrubland over *Acacia tetragonophylla* and *E. forrestii* subsp. *forrestii* scattered shrubs over *Triodia pungens* scattered hummock grasses over *Chrysopogon fallax* and *Themeda triandra* very open tussock grassland over *Digitaria ctenantha, Aristida contorta* and *Enneapogon polyphyllus* very open annual grassland with *Fimbristylis dichotoma* scattered sedges; **G3:** *Corymbia hamersleyana, C. ferriticola* and *Eucalyptus leucophloia* subsp. *leucophloia* low open woodland over *Grevillea wickhamii* subsp. *hispidula, Acacia tumida* var. *pilbarensis* and *Androcalva luteiflora* tall shrubland over (*Acacia maitlandii* and *A. hamersleyensis* scattered shrubs to open shrubland over) *Triodia pungens* very open hummock grassland over *Eriachne mucronata*, *Themeda triandra* and *Cymbopogon ambiguus* very open tussock grassland; **G24:** *Corymbia ferriticola* (*Eucalyptus leucophloia* subsp. *leucophloia* and *Ficus brachypoda*) low open woodland to low woodland over *Acacia catenulata* subsp. *occidentalis, A. aptaneura* and/or *A. mulganeura* tall open shrubland over (*Dodonaea pachyneura* and other species scattered shrubs to open shrubland over) *Triodia pungens* (and T. sp. Mt Ella (M.E. Trudgen 12739) P3) very open hummock grassland to open hummock grassland with *Eriachne mucronata* very open tussock grassland; **H3:** *Eucalyptus leucophloia* subsp. *leucophloia* and/or *Corymbia deserticola* subsp. *deserticola* scattered low trees to low open woodland over *Hakea chordophylla, Acacia trudgeniana* and/or *A. inaequilatera* scattered tall shrubs to tall open shrubland (over *A. hilliana, A. bivenosa* and/or *Ptilotus rotundifolius* scattered shrubs to low open shrubland) over *Triodia vanleeuwenii* (and *T. pungens, T. wiseana* and/or *T. brizoides*) open hummock grassland to hummock grassland (over *Fimbristylis simulans* scattered sedges to very open sedgeland); **H10:** *Eucalyptus socialis* subsp. *eucentrica* and/or *E. repullulans* scattered low mallees to low mallee woodland over *Triodia wiseana* and *T. angusta* very open hummock grassland to hummock grassland; **H11:** (*Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees to low open woodland over) *Eucalyptus gamophylla* scattered low mallees to low mallee woodland over *Acacia bivenosa, Hakea chordophylla* and/or *A. trudgeniana* (and/or other Acacia spp.) scattered shrubs to tall open shrubland over (*Androcalva loxophylla, Seringia exastia* and/or *Scaevola parvifolia* scattered low shrubs to low open shrubland over) *Triodia vanleeuwenii* and *T. pungens* very open hummock grassland to hummock grassland; **H12:** (*Corymbia hamersleyana* and/or *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees to low open woodland over) *Acacia inaequilatera* (and/or *A. bivenosa*) scattered shrubs to tall open shrubland over (*Senna artemisioides* subsp. *oligophylla* scattered low shrubs over) *Triodia wiseana* open hummock grassland; **H14:** *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees to low open woodland over *Acacia sibirica, A. bivenosa* and other Acacia spp. scattered shrubs to tall open shrubland over *Triodia vanleeuwenii* (and *T. pungens*) open hummock grassland to hummock grassland; **H15:** *Eucalyptus leucophloia* subsp. *leucophloia* scattered low trees over *Hakea chordophylla* (and/or *Acacia marramamba* or *A. pruinocarpa*) scattered tall shrubs over *A. arida* open shrubland to shrubland over *Triodia vanleeuwenii* (and *T. pungens* or *T. wiseana*) open hummock grassland to closed hummock grassland;

Characteristic	Details
	H19: *Eucalyptus leucophloia* subsp. *leucophloia* and/or *Corymbia deserticola* subsp. *deserticola* scattered low trees to low open woodland over *Acacia pruinocarpa, A. aptaneura* and *A. catenulata* subsp. *occidentalis* (and other Acacia spp.) tall open shrubland (over *Eremophila exilifolia, Ptilotus rotundifolius* and/or *P. obovatus* scattered low shrubs to shrubland) over *Triodia pungens, T. vanleeuwenii* (and *T. wiseana*) hummock grassland; **H20:** *Eucalyptus victrix* (and *Corymbia candida*) scattered low trees to open woodland over *Acacia aptaneura, A. pruinocarpa* (and *A. tetragonophylla*) tall open shrubland to tall shrubland over *Ptilotus obovatus* var. *obovatus* low open shrubland to low shrubland over (*Triodia wiseana* open hummock grassland over **Cenchrus ciliaris* and *Themeda triandra* very open tussock grassland with) *Digitaria ctenantha, Enneapogon caerulescens* and *Enneapogon lindleyanus* open annual grassland; **H21:** *Eucalyptus socialis* subsp. *eucentrica* and *E. repullulans* scattered low mallees to low mallee woodland over (*Acacia bivenosa* and/or other *Acacia* spp. scattered tall shrubs to tall open shrubland over) *Melaleuca eleuterostachya* scattered shrubs to shrubland over *Triodia wiseana* and *T. angusta* very open hummock grassland to hummock grassland; **H22:** *Eucalyptus leucophloia* subsp. *leucophloia* (and *Corymbia ferriticola*) scattered low trees over *Acacia catenulata* subsp. *occidentalis*, *A. aptaneura* (and *Grevillea berryana*) tall shrubland to tall open scrub over *Triodia pungens* scattered hummock grasses to open hummock grassland over *Eriachne mucronata* scattered tussock grasses to very open tussock grassland; **H25:** *Eucalyptus leucophloia* subsp. *leucophloia* (and *Corymbia deserticola* subsp. *deserticola*) scattered low trees to low open woodland over *Acacia marramamba, A. rhodophloia* and *A. sibirica* (and/or other Acacia spp.) scattered shrubs to tall open shrubland over *Triodia pungens* and *T. vanleeuwenii* very open hummock grassland to hummock grassland; **H26:** *Corymbia hamersleyana* (and *Eucalyptus leucophloia* subsp. *leucophloia*) low open woodland over *Acacia hamersleyensis, A. adsurgens* and *A. sibirica* (and other Acacia spp.) tall open scrub over *Triodia vanleeuwenii* and *T. wiseana* hummock grassland; **H27:** *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* scattered low trees to low open woodland over (*Hakea chordophylla* scattered tall shrubs over) *Seringia exastia, Acacia adoxa* var. *adoxa* and *Mirbelia viminalis* scattered low shrubs to low open shrubland over *Triodia vanleeuwenii, T. pungens* and/or *T. wiseana* open hummock grassland to hummock grassland; **H33:** *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* scattered low trees to low open woodland over *E. gamophylla* and *E. kingsmillii* low open mallee woodland over (*Acacia adoxa* var. *adoxa, A. hilliana* and *Seringia exastia* scattered low shrubs to low shrubland over) *Triodia pungens, T. vanleeuwenii* and/or *T. brizoides* open hummock grassland; **H34:** *Eucalyptus trivalva, E. repullulans* (and *E. socialis* subsp. *eucentrica*) low open mallee woodland over *Triodia wiseana* open hummock grassland; **H42:** *Eucalyptus gamophylla* and *E. kingsmillii* low open mallee woodland over *Acacia atkinsiana* (*A. kempeana, A. sibirica* and/or *A. rhodophloia*) tall open shrubland to tall shrubland over *A. spondylophylla* scattered low shrubs to low open shrubland over *Triodia vanleeuwenii* and *T. pungens* hummock grassland; **P1:** *Acacia catenulata* subsp. *occidentalis, A. aptaneura* and *A. pruinocarpa* tall open shrubland to tall open scrub over *Sida ectogama, Eremophila forrestii* subsp. *forrestii* and/or *Rhagodia* sp. Hamersley (M. Trudgen 17794) P3 scattered shrubs to open shrubland over (*Triodia pungens* and/or *T. melvillei* scattered hummock grasses to open hummock grassland over) *Aristida contorta, Perotis rara, Aristida obscura* (and other species) scattered annual grasses to open annual grassland (over **Bidens bipinnata* scattered herbs to open herbland), with strong to weak banding on sheet flow hard pan clay plains; **P3:** *Acacia pruinocarpa, A. catenulata* subsp. *occidentalis* and *A. aptaneura* tall open shrubland to tall open scrub over *Eremophila forrestii* subsp. *forrestii* scattered shrubs to shrubland over *Triodia pungens* very open hummock grassland to open hummock grassland on pediments and the edges of rocky plains; **P1/P3 Mosaic:** Mosaic of P1 weakly banded mulga vegetation with P3 rocky clay plain and pediment mulga shrublands; **P5:** (*Eucalyptus victrix* scattered low trees to low open woodland over) *Acacia aptaneura* tall open shrubland to tall shrubland over (*Rhagodia eremaea* and or *Ptilotus obovatus* var. *obovatus* scattered low shrubs to shrubland over) *Aristida latifolia* and *Chrysopogon fallax* scattered tussock grasses to open tussock grassland over *Iseilema vaginiflorum, Urochloa occidentalis*

Characteristic	Details
	var. *occidentalis* and *Enneapogon polyphyllus* very open annual grassland to annual grassland over **Bidens bipinnata* scattered herbs on crabhole clay plains; **P8:** (*Corymbia candida,* or *C. deserticola* subsp. *deserticola* and/or *Eucalyptus xerothermica* scattered low trees to open woodland over) *Acacia aptaneura* (*A. catenulata* subsp. *occidentalis* and *A. pruinocarpa*) tall open shrubland to tall open scrub over *Ptilotus obovatus* var. *obovatus* scattered low shrubs to low open shrubland over (*Triodia melvillei* scattered hummock grasses over) *Themeda triandra, Eriachne benthamii* and *Chrysopogon fallax* very open tussock grassland over *Aristida contorta, Perotis rara, Enneapogon polyphyllus* (and other species) scattered annual grasses to open annual grassland over **Bidens bipinnata* scattered herbs to very open herbland on hardpan clay plains; **P9:** *Acacia aptaneura* scattered tall shrubs to tall open shrubland over *Eremophila lanceolata* or *E. caespitosa* and/or *Ptilotus schwartzii* var. *schwartzii* scattered low shrubs over (*Eriachne benthamii* and/or *Chrysopogon fallax* scattered tussock grasses over) *Aristida contorta* (*Perotis rara, Paspalidium rarum* and other species) scattered annual grasses to open annual grassland on hardpan clay plains; **P8/P9 Mosaic:** Mosaic of sparsely vegetated P9 with P8 mulga shrublands over tussock grasses on hardpan clay plains; **P13:** (*Eucalyptus xerothermica* scattered low trees over) *Acacia aptaneura* and *Hakea lorea* subsp. *lorea* scattered tall shrubs to tall open shrubland over *Themeda triandra* and *Chrysopogon fallax* open tussock grassland to tussock grassland over *Iseilema vaginiflorum*, *Enneapogon polyphyllus, Eragrostis cumingii* (and other species) very open annual grassland to annual grassland over *Ptilotus polystachyus* and *Rhodanthe charsleyae* scattered herbs to very open herbland on crabhole clay plains. **P14:** *Acacia catenulata* subsp. *occidentalis, A. aptaneura* and *A. pruinocarpa* tall open shrubland to tall open scrub over (*Sida ectogama* and/or *Eremophila forrestii* subsp. *forrestii* scattered shrubs to shrubland over) *Triodia melvillei* very open hummock grassland to open hummock grassland (over *Aristida contorta* and *Enneapogon polyphyllus* scattered annual grasses to very open annual grassland) on pediments and the edges of rocky plains; **P15:** *Astrebla elymoides* (*Astrebla pectinata, Aristida latifolia* and *Chrysopogon fallax*) open tussock grassland to tussock grassland over *Dichanthium sericeum* subsp. *humilius*, *Iseilema vaginiflorum, Urochloa occidentalis* var. *occidentalis* and other species very open annual grassland with *Ipomoea lonchophylla, Euphorbia coghlanii* and *Vigna* sp. Hamersley Clay (A.A. Mitchell PRP 113) scattered herbs to open herbland on crabhole clay plains. May represent 'West Angelas Cracking-Clays' priority 1 PEC; **P16:** (*Acacia aptaneura* scattered tall shrubs over) *Aristida latifolia, Eragrostis xerophila, Eriachne flaccida* (and other species) open tussock grassland (over mixed species scattered annual grasses to closed annual grassland with *Sida fibulifera* and *Vigna* sp. Hamersley Clay (A.A. Mitchell PRP 113) scattered herbs to very open herbland) on crabhole clay plains. **P18**: *Acacia aptaneura, A. tetragonophylla* and *A. catenulata* subsp. *occidentalis* tall open shrubland over *Eremophila galeata* scattered shrubs over (*Triodia pungens* scattered hummock grasses over) *Aristida contorta* (and other species) very open annual grassland on hard pan clay plains; **Rehabilitation:** Mixed Acacia spp. regrown over mixed tussock grasses and herbs; There were also areas which were mapped as cleared.
Vegetation condition	The vegetation survey indicated the vegetation within the proposed clearing area is in excellent to completely degraded (Trudgen, 1991) condition, with over 95% of the application area in either excellent or very good condition (Astron, 2022). The full Trudgen (1991) condition rating scale is provided in Appendix D.
Climate and landform	The application area is mapped at elevations of 700-850 metres AHD (GIS Database). The annual average rainfall (Newman) is 324.4 millimetres (BoM, 2022).
Soil description	The soil is mapped as soil units Fa13, Fa14 and Fb3 (GIS Database). The soil types are described as (Northcote et al., 1960-68): • Fa13: Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and

Characteristic	Details
	there are extensive areas without soil cover. Chief soils are shallow stony earthy loams along with some soils on the steeper slopes (Northcote, 1960-68). • Fa14: Steep hills and steeply dissected pediments on areas of banded jaspilite and chert along with shales, dolomite, and iron ore formations; some narrow winding valley plains: chief soils are shallow stony earthy loams along with some soils on the steeper slopes. • Fb3: High-level valley plains set in extensive areas of unit Fa13. There are extensive areas of pisolitic limonite deposits: principal soils are deep earthy loams.
Land degradation risk	The application area is mapped as the Boolgeeda, Egerton, Newman, Platform, Rocklea, Spearhole and Wannamunna land systems (GIS Database).
Waterbodies	The desktop assessment and aerial imagery indicated that there are numerous minor, non-perennial watercourses which transect the area proposed to be cleared.
Hydrogeography	The application area is not within any public drinking water source areas. The mapped groundwater salinity is 500-1,000 milligrams per litre total dissolved solids which is described as marginal (GIS Database).
Flora	There are records of 21 priority flora species within the application area.
Ecological communities	There are two Priority Ecological Communities recorded within the application area.
Fauna	There are records of several conservation significant fauna species within the application area.

B.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information (Astron, 2022), impacts to the following conservation significant flora required further consideration.

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Threatened					
Pityrodia augustensis (EPBC: VU)	Bushy shrub to 1 m high. Flowers purple-red, August to September.	Perennial	Amongst rocks on slopes, or in drainage lines. Sandstone substrate or yellow brown sandy loam over granite.	>200	Unlikely
Priority 1					
Calotis squamigera	Procumbent herb, to 0.25 m high. Prostrate radiating branches, leaves light to mid green. Flowers yellow, July.	Annual	Pebbly/stony red brown loam, poorly defined flowline on plain.	44.8	Unlikely
Eragrostis sp. Mt Robinson (S. van Leeuwen 4109)	Tussock-forming grass-like or herb with woolly base, to 0.3 m high. Flowers September.	Perennial	Red-brown skeletal soils, ironstone. Steep slopes, summits. Found within *Eucalyptus* mallee shrubs and *Acacia* spp. Over hummock grasses.	30.5	Recorded (Current survey)
Eremophila sp. West Angelas (S. van Leeuwen 4068)	Erect-branched spindly whip shrub with narrow leaves to 3 m high. Flowers purple, September to October.	Perennial	Very steep rocky hillslopes and ridges of brown silty loam. Breakaways, skeletal red gritty soil over massive banded iron. Mulga bands in clay soils between rocky ridges.	2.8	Unlikely
Goodenia pedicellata	Single stemmed herb with dense cottony and strigose hairs, to 0.25 m high. Flowers yellow, June.	Perennial	Open exposed sites with scattered sparse shrubs on rocky slopes and crests of low hills.	8.3	Unlikely
Hibiscus sp. Mt Brockman (E. Thoma ET 1354)	Shrub, to 3 m high. Flowers purple/mauve, February to August.	Perennial	Hill summit, gorge, sheltered or rocky drainage lines below associated cliff-lines or rocky ridges. Red brown sand, skeletal soils.	32.4	Unlikely

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Lindernia sp. Pilbara (M.N. Lyons & L. Lewis FV 1069)	No Information Available.	Annual or short-liver perennial. Sometimes aquatic.	Clay pans, lower slope of dune, riparian slope at water's edge, berm on eastern edge of wetland.	42.5	Unlikely
Myriocephalus scalpellus	Prostrate to semi-erect herb, 0.03 m to 0.08 m high. Flowers yellow-white, July to September.	Annual	Depression on flood plain. Clay soils. Sandy clays and loams around clay pan.	42.3	Unlikely
Rorippa sp. Fortescue Valley (M.N. Lyons & R.A. Coppen FV 0760)	No Information Available	Annual	Riparian slope at water's edge.	42.5	Unlikely
Synostemon hamersleyensis	Small divaricate subshrub to 1 m high. Glabrous, perennial woody rootstock. Flowers August to November.	Perennial	Steep scree slope below banded iron formation cliff line with brown sandy loam soil, skeletal ironstone. Breakaway formations and rocky outcrops of incised gully systems. Occurs most commonly at 500 m to 700 m altitude.	44.4	Unlikely
Triodia sp. Karijini (S. van Leeuwen 4111)	Wispy hummock grass 0.6 m to 1 m tall. Non-resinous to weakly resinous, soft-type foliage. Flowers September.	Perennial	Summits or Mid to upper steep slopes, ridgelines, skeletal soils. On or near outcropping ironstone.	28.9	Unlikely
Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)	Erect-branched herb or subshrub to 1 m high. Flowers cream, July.	Short-lived perennial	Major drainage/floodplain in valley between ranges. Flat plain, clays, cracking clay, gilgai, low in landscape, red sandy clay loam with some stone. Dark reddish brown sandy loam.	0	Recorded (DBCA 2021b)

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Priority 2					
Aristida lazaridis	Densely tufted grass, 0.4 m to 1.5 m high. Leaf-blade surface scaberulous. Flowers in April.	Perennial	Sand, loam, clayey soils. Plains, ironstone hills.	0	Recorded (Current survey, Rio Tinto 2021b)
Cladium procerum	Densely tufted grass-like or herb (sedge) to 2 m high. Nodding inflorescences. Flowers brown, July, October, November.	Perennial	Perennial streams and pond edges. Along streams in deep gorges of Hamersley Range.	20.5	Unlikely
Euphorbia inappendiculata var. *inappendiculata*	Spreading procumbent herb, to 0.1 m high. Flowers May and August (Halford, D.A. and Harris W.K, 2012)	Short-lived Perennial	Cracking clay (gilgai) flats and depressions. Heavy clay soils on open plains or gently slopes (Halford, D.A. and Harris W.K, 2012)	0	Recorded (Current survey)
Euphorbia inappendiculata var. *queenslandica*	Spreading, much-branched, procumbent herb to 0.3m long. Leaves opposite, petiolate, obovate, very small sinuate-denticulate and glabrous. Flowers and fruits have been collected throughout the year (Halford, D.A. and Harris W.K, 2012).	Short-lived Perennial	Dark reddish brown clay or loam. Cracking clay (gilgai) flats and depressions. Quartzite.	4.0	Unlikely
Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708)	Spindly upright shrub to 3 m high. Flowers May to July.	Perennial	Near summit of hill, high in landscape, skeletal red-brown stony soil over massive ironstone of the Brockman Iron Formation. Sheltered or rocky drainage lines below cliffs.	0	Recorded (Current survey)
Ipomoea racemigera	Pilose creeping herb or climber. Ovate leaves, glabrous upper surface. Flowers white, March to August.	Annual	Flats with brown silty loam soil, major drainage. Creek lines. Sandy soils along watercourses.	0	Recorded (Current survey)

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Isotropis parviflora	Shrub, 0.1 m high. Flowers white/pink, March.	Perennial	Valley slope of ironstone plateau. Hillslopes. Associated with mallee on slopes or hard spinifex on ironstone.	0	Recorded (Current survey, DBCA 2021b, Rio Tinto 2021b)
Oxalis sp. Pilbara (M.E. Trudgen 12725)	Small, trailing or tufted, three leaved herb. Leaves with purplish underside. Flowers yellow, May to September.	Annual or short-lived Perennial	In gullies and on gully walls. Shaded areas around rock outcrops and gullies.	0	Recorded (Current survey, DBCA 2021b)
Rhodanthe frenchii	Upright herb to 0.35 m high. Flowers yellow, August to October.	Annual	Stony hills, rocky riverbanks and outcrops.	37.2	Unlikely
Tetratheca fordiana	Dwarf shrub, with large obvious hairs on stem, to 0.4 m high. Flowers pink, June to July, September.	Perennial	Cliff faces, crests, ridges and outcrops in upper rocky ironstone ridgelines, skeletal soil. Shale pocket amongst ironstone, high in landscape.	40.5	Unlikely
Teucrium pilbaranum	Upright shrub, 0.2 m high. Flowers white, May or September.	Perennial	Clay. Crab hole plain in a river floodplain, margin of calcrete table.	0	Recorded (Rio Tinto 2021b)
Priority 3					
Acacia daweana	Spreading shrub, 0.3 m to 1.5 (-2) m high. Flowers yellow, July to September.	Perennial	Stony red loamy soils. Low rocky rises, along drainage lines. Rocky skeletal loam on lower scree slopes. Outwash fans of rocky banded ironstone ranges and ridges.	45.7	Unlikely
Acacia effusa	Low, dense, spreading, somewhat viscid shrub, 0.3 m to 1.2 m high, bark 'minniritchi'. Flowers yellow, May to August.	Perennial	Stony/rocky red loam. Scree slopes of low ranges, diffuse drainage lines. Alluvial plain at base of large banded ironstone mountains and ranges.	34.5	Unlikely

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Acacia subtiliformis	Spindly, slender, erect shrub, to 3.5 m high, new growth slightly viscid, resinous, aromatic. Peduncles red. Flowers yellow, June to August.	Perennial	Low undulating country on calcareous rises adjacent to drainage lines. On rocky calcrete plateaux.	0	Recorded (Current survey, Rio Tinto 2021b)
Amaranthus centralis	Herb, decumbent or erect to 0.6 m high. Stems angular, sometimes reddish. Flowers January to December.	Annual	Red sand in ephemeral watercourses and loams on edge of permanent pools. Sand plain, river bank, mulga woodland. Granite outcrop. Silty sand amongst granite boulders.	36.1	Unlikely
Aristida jerichoensis var. *subspinulifera*	A compactly tufted grass-like or herb with lemma groove muricate. 0.3 m to 0.8 m high. Leaf blade wire-like.	Perennial	Hardpan plains, Crackling clay, Floodplain with red brown clay loam.	0	Recorded (Current survey, DBCA 2021b, Rio Tinto 2021b)
Crotalaria smithiana	Erect, soft wooded shrub or herb to 0.4 m high. Flowers yellow, June.	Annual or short-lived Perennial	Alluvium on floodplains.	47.4	Unlikely
Dampiera metallorum	Rounded, multi-stemmed herb or shrub, to 0.5 m high. Dense, appressed dendritic hairs but becoming glabrescent with age. Flowers blue, April, June or October.	Perennial	Skeletal red-brown gravelly soil over banded ironstone. Steep slopes, summits of hills.	2.5	Unlikely
Dolichocarpa sp. Hamersley Station (A.A. Mitchell PRP 1479)	Spreading herb to 0.1 m high. Flowers blue, March.	Annual	Cracking clay, basalt. Gently undulating plains with large surface rocks, flat crabholed plains.	0	Recorded (Current survey)
Eremophila magnifica subsp. *velutina*	Aromatic shrub 0.5 m to 1.5 m high. Velutinous. Flowers blue-purple, June to September.	Perennial	Skeletal soils on the slopes and summits of ironstone hills.	16.8	Unlikely

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Eremophila rigida	Erect, bushy shrub, 0.3 m to 4 m high with rigid to leathery ovate leaves. Flowers cream, June to September.	Perennial	Red sand alluvium. Hardpan plains, stony clay depressions.	31.2	Unlikely
Eremophila sp. Hamersley Range (K. Walker KW 136)	Erect shrub 1 to 3.5 m high. Flowers white-cream-yellow-pink-purple, June to October.	Perennial	High in the landscape, cliff tops, gorge tops, steep rocky slopes, skeletal red-brown soils.	7.5	Unlikely
Euphorbia australis var. *glabra*	Prostrate spreading herb or groundcover, stems much-branched sometimes ascending, green or reddish.	Annual	Sump, low in landscape, Saline flats on alluvial cracking clay loamy soil, gritty with ironstone fragments.	0	Recorded (Current survey)
Euphorbia clementii	Hard, decumbent, pale stemmed herb to 0.6 m high.	Annual or Short-lived perennial	Gravelly hillsides, stony grounds. Clay plains, rocky ironstone slopes, drainage lines on red brown sand.	36.4	Unlikely
Euphorbia stevenii	Glabrous, upright somewhat succulent herb/herbaceous subshrub, to 0.5 m high. Likely to flower throughout the year in response to rainfall.	Perennial or Biennial	Clay or clay loam, sandy soils, cracking clay with scattered pebbles, floodplains.	44.1	Unlikely
Fimbristylis sieberiana	Shortly rhizomatous, tufted, grass-like or herb (sedge), 0.25 m to 0.6 m high. Flowers brown, May to June.	Perennial	Mud, skeletal soil pockets. Pool edges, sandstone cliffs.	18.2	Unlikely
Glycine falcata	Mat-forming herb, to 0.2 m high. Flowers blue/purple, May to July.	Perennial	Drainage depressions in crabhole plains on river floodplains. Black clayey sand.	0	Recorded (Current survey)
Goodenia lyrata	Prostrate herb with lyrate leaves. Flowers yellow, August.	Annual	Red sandy loam. Near claypan. Poorly drained flats.	15.1	Unlikely

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Goodenia purpurascens^	Erect herb, 0.1 m to 0.3 m high. Flowers blue-purple/white/yellow, January to December.	Annual or short-lived Perennial	Clay, mud. Swamps and seasonally wet depressions.	3.5	Unlikely
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	Open, erect herb, rosetted with spathulata leaves to 0.2 m high. Flowers yellow, March to September.	Annual or short-lived Perennial	Red-brown clay soil, calcrete pebbles. Low undulating plain, swampy plains, stony plains, hill slopes.	0	Recorded (Current survey, DBCA 2021a; 2021b, Rio Tinto 2021b)
Grevillea saxicola	Erect shrub to 2.5 m high. Flowers February, April, November.	Perennial	Low rocky hill, red-brown sandy loam with ironstone pebble cover. Upper steep scree/breakaway slopes and crests associated with banded iron formation outcropping. Mulga woodlands.	3.1	Unlikely
Gymnanthera cunninghamii	Erect woody shrub, 1 m to 2 m high. Leaves somewhat leathery, lanceolate to elliptic. Flowers cream-yellow-green, January to December.	Perennial	Red/brown/white sandy soils in and adjacent to drainage lines. Riverine brown loam-clay, ironstone scree slopes adjacent to drainage lines, floodplains with sandy soils, foot of low limestone ridge adjacent to mudflats, beach sand.	4.5	Unlikely
Indigofera gilesii	Shrub, to 1.5 m high. Leaflets green with white margin. Flowers purple-pink, June to October.	Perennial	Rocky slopes, gullies, high in landscape, skeletal soils overlaying ironstone formations, red brown loam.	0	Recorded (Current survey, DBCA 2021a; 2021b, Rio Tinto 2021b)
Olearia mucronata	Densely branched, unpleasantly aromatic shrub, 0.6 m to 1 m high. Flowers white and yellow, August to December or January.	Perennial	Schistose hills, along drainage channels. Mesic areas amongst ironstone boulders and creek lines. Margins of dry creek lines.	37.2	Unlikely

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Phyllanthus hebecarpus	Woody shrub, to 0.5 m high. Covered in small hairs that give plant a grey appearance.	Perennial	Moist sites on plateaus or ridges. Granite outcrops.	10.5	Unlikely
Pilbara trudgenii	Gnarled, aromatic shrub, to 1 m high. Flowers white, September.	Perennial	Skeletal, red stony soil over ironstone. Hill summits, steep slopes, screes, cliff faces.	28.6	Unlikely
Rhagodia sp. Hamersley (M. Trudgen 17794)	Shrub, 2.5 m high, leaves small lanceolate, not aromatic. Flowers yellow, from May. Fruit small red drupelets.	Perennial	Mulga plains. Alluvial plains. Red brown clay to loamy clay. Occasionally on slopes.	0	Recorded (Current survey, DBCA 2021b, Rio Tinto 2021b)
Rostellularia adscendens var. *latifolia*	Herb or shrub, 0.1 m to 0.3 m high. Angular stems and small flowers covered by conspicuous bract. Flowers blue-purple-violet, April to May.	Perennial	Ironstone soils. Near creeks or watercourses, along shaded rocky ridges, often in dry gullies and gorges. Rocky hills.	0	Recorded (Rio Tinto 2021b)
Sida sp. Barlee Range (S. van Leeuwen 1642)	Spreading shrub to 0.5 m high. Flowers yellow, August.	Perennial	Skeletal red soils pockets. Steep scree slopes and rock piles, small chines and gullies.	15.5	Unlikely
Sida sp. Hamersley Range (K. Newbey 10692)	Semi-prostrate to upright shrub to 2 m high. Flowers yellow, September to October.	Perennial	Gorges, base of cliffs, rocky outcrops and breakaways. Occasionally in flat areas between hills in shrubby grasslands.	26.3	Unlikely
Solanum kentrocaule	Erect spindly shrub 0.5 m to 1.5 m high. Flowers mauve/purple, May to September.	Perennial	Hamersley ranges between 700 m to 1,250 m altitude. Hillsides and mountaintops, or occasionally creek beds, in skeletal red-brown soil over ironstone or on basalt scree.	1.6	Unlikely
Streptoglossa sp. Cracking clays (S. van Leeuwen et al. PBS 7353)	Multi-stemmed erect herb. Flowers pink to dark pink, June.	Annual	Cracking clays. Colluvial and alluvial gravels in fan or floodplain.	0	Recorded (Current survey)

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Stylidium weeliwolli	Herb, 0.1 m to 0.25 m high. Flowers pink-red, August to September.	Annual	Gritty sand soil, sandy clay. Edge of watercourses, gorges.	9.7	Unlikely
Swainsona thompsoniana	Prostrate herb to 0.1 m. Flowers mauve-cream-yellow, August to September.	Annual	Open flood plains on heavy clay soils, crabhole plains and gilgai.	0	Recorded (Current survey)
Tecticornia medusa	Erect shrub to 0.7 m high. Vegetative articles obovoid to cylindrical, not compressed. Flowers July to November.	Perennial	Flat floodplain. Red clayey sand.	49.8	Unlikely
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	Tussocky grass, 0.9 m to 1.8 m high. Flowers August.	Perennial	Drainage lines, clay flats, crabhole flats and dark, self-mulching clays. Red clay. Clay pan, grass plain.	0	Recorded (Current survey, DBCA 2021b, Rio Tinto 2021b)
Triodia basitricha	Hummock grass to 0.8 m high, soft, non-resinous to moderately resinous, lower leaf sheaths hairy. Flowers May.	Perennial	Gravelly low hill and small gully at base of steep slope. Crest of sandstone/basalt hill. Along drainage line at base of steep slope; skeletal red gritty alluvial soil amongst cobble, large boulders, and rocky screes. Undulating rocky uplands.	37.8	Unlikely
Triodia sp. Mt Ella (M.E. Trudgen 12739)	Hummock grass to 0.5 m high. Foliage copiously resinous, leaf sheath surface glabrous. Flowers February.	Perennial	Light orange-brown, pebbly loam. Amongst rocks and outcrops, gully slopes. Ephemeral creek banks, flow lines, skeletal soil over massive ironstone.	0	Recorded (Current survey, Rio Tinto 2021b)
Xerochrysum boreale	Erect shrub, 1.5 m high. Flowers yellow, September.	Perennial	Mulga on stony surfaced red-brown, clay-loam.	0	Recorded (DBCA 2021b)

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Priority 4					
Acacia bromilowiana	Tree or shrub, to 6.5 m high and occasionally to 12 m high. Phyllodes more or less glaucous and slightly pruinose. Flowers yellow/pink, July to August.	Perennial	Red skeletal stony loam, orange-brown pebbly, gravel loam, laterite, banded ironstone, basalt. High in landscape, rocky hills, breakaways, ridge tops, steep scree slopes, gorges, creek beds.	0	Recorded (Rio Tinto 2021b)
Eremophila magnifica subsp. *magnifica*	Shrub, 0.5 m to 1.5 m high. Aromatic, glabrous. Flowers blue/purple, June to September.	Perennial	Skeletal soils over ironstone. Rocky screes. Slopes and summits.	2.7	Unlikely
Eremophila youngii subsp. *lepidota*	Dense, erect spreading shrub, to 4 m high. Flowers purple-red-pink, January to September.	Perennial	Occurs on stony red sandy loam, flats, plains, drainage lines, floodplains and sometimes semi-saline, clay flats. Margins of clay depressions.	4.5	Unlikely
Goodenia nuda	Erect to ascending herb, to 0.5 m high. Flowers yellow, April to August.	Short-lived Perennial	Alluvial soils over ironstone, floodplains, valleys, watercourses, floodplains and in orange-brown alluvial sand over ironstone. Clay soils and drainage lines.	0	Recorded (Current survey, DBCA 2021b, Rio Tinto 2021b)
Lepidium catapycnon	Open, woody herb or shrub, 0.2 m to 0.3 m high, stems zigzag. Flowers white, October.	Perennial	Skeletal soils in open woodland. Hillsides. More frequent on south facing slopes.	0	Recorded (DBCA 2021a; 2021b, Rio Tinto 2021b)
Ptilotus mollis	Compact shrub, to 0.5 m high, soft grey foliage. Stems teres, densely hairy, with nodose hairs. Flowers white/pink, May or September.	Perennial	Stony hills, steep rocky sites and screes, in drainage lines. Usually in full sun on massive ironstone formations.	2.9	Unlikely

Species	Habit and flowering information[1]	Life form[1]	Habitat[1]	Distance of closest record from survey area (km) [2]	Post-survey likelihood of occurrence
Rhynchosia bungarensis	Compact, prostrate shrub, to 0.5 m high. Fl. yellow. Pebbly, shingly coarse sand amongst boulders. Flowers yellow, May, June and November.	Perennial	Banks of flow line in the mouth of a gully in a valley wall.	34.0	Unlikely

B.3. Fauna analysis table

Scientific name (common name)	Conservation codes			Preferred habitat	Likelihood of occurrence	
	EPBC Act	BC Act	DBCA		Pre-survey	Post survey
Reptiles						
Underwoodisaurus seorsus (Pilbara Barking Gecko)			P2	Confined in the Pilbara to the Hamersley Ranges from Tom Price to Newman. Occurs in rocky areas with spinifex and low tree cover.	High	High
Lerista macropisthopus remota			P2	This subspecies is in the central interior in woodlands and semi-arid shrublands where animals shelter under leaf litter. This species is generally found in the central interior particularly the Ashburton region.	High	High
Anilios ganei			P1	Little information is available on this species but it is believed to be associated with moist gorges and gullies.	High	High
Liasis olivaceus barroni (Pilbara Olive Python)	VU	VU		Generally rocky habitats in close association to permanent and semi-permanent water sources.	High – previously recorded within survey area	High
Birds						
Macronectes giganteus (Southern Giant Petrel)	EN, MI	MI		Predominantly pelagic species that is independent of terrestrial habitats.	Low	Low
Plegadis falcinellus (Glossy Ibis)	MI	MI		Wetland habitats such as freshwater marshes at the edges of lakes, rivers and wet swamp areas. This species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons.	Low	Low
Elanus scriptus (Letter-winged Kite)			P4	The Letter-winged Kite is a bird of open country and grasslands in arid and semi-arid Australia, where there are tree-lined streams or water courses.	High	High
Pandion cristatus (Osprey, Eastern Osprey)	MI	MI		Occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Also coastal areas, and occasionally travel inland along major rivers.	Low	Low

Scientific name (common name)	Conservation codes			Preferred habitat	Likelihood of occurrence	
	EPBC Act	BC Act	DBCA		Pre-survey	Post survey
Charadrius veredus (Oriental Plover)	MI	MI		Breeding habitat includes arid grasslands, saltpans; non-breeding habitat includes grasslands, salt-fields, and coastal regions.	High	High
Rostratula australis (Australian Painted Snipe)	EN	EN		Inhabits shallow terrestrial freshwater wetlands, lakes, swamps and claypans. Also found in waterlogged grassland and saltmarsh. Typical sites include areas with emergent tussocks of grass, sedges or samphire; often scattered with clumps of lignum *Muehlenbeckia*, or canegrass or sometimes with tea-tree (*Melaleuca*).	Low	Low
Actitis hypoleucos (Common Sandpiper)	MI	MI		Non-breeding migrant to a wide variety of habitats, such as riverbanks, estuaries, freshwater seeps on coastal shores, tidal creeks, mangrove swamps and saltmarshes.	Low	Low
Calidris acuminata (Sharp-tailed Sandpiper)	MI	MI		Muddy edges of shallow fresh/brackish wetlands with emergent sedges, saltmarsh, grass and low vegetation.	Low	Low
Calidris ferruginea (Curlew Sandpiper)	CR/MI	CR/MI		This species mainly occurs on intertidal mudflats in sheltered coastal areas and also around non-tidal swamps, lakes and lagoons near the coast. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	Low	Low
Calidris melanotos (Pectoral Sandpiper)	MI	MI		Mainly swamps, lagoons, river pools, irrigation channels and sewerage ponds. Also in samphire flats around estuaries and salt lakes.	Low	Low
Calidris ruficollis (Red-necked Stint)	MI			The edge of sheltered waters including estuaries, beaches, near-coastal salt lakes, swamps, lakes, sewerage ponds and bore overflows.	Low	Low
Calidris subminuta (Long-toed Stint)	MI			Generally found in coastal environments such as coastal margins, lagoons, beaches and tidal flats.	Low	Low

Scientific name (common name)	Conservation codes			Preferred habitat	Likelihood of occurrence	
	EPBC Act	BC Act	DBCA		Pre-survey	Post survey
Tringa glareola (Wood Sandpiper)	MI	MI		Generally open areas such as the margins of inland freshwater lakes and reservoirs. This species rarely occurs in coastal habitats, but may be found along the creeks of saltmarshes and mangrove swamps.	Low	Low
Tringa nebularia (Common Greenshank)	MI	MI		A variety of freshwater, marine and artificial wetlands, including swamps, open muddy or rocky shores of lakes and large rivers, sewage farms, saltworks, muddy coastal flats, mangroves and estuaries.	Low	Low
Tringa stagnatilis (Marsh Sandpiper)	MI	MI		Found at the margins of inland freshwater and brackish wetlands such as rice paddy-fields, swamps, salt-pans, salt-marshes, sewage works and marshy lake-edges, and although it is rare on open coastlines it can occasionally be found on estuaries, lagoons and intertidal mudflats.	Low	Low
Tringa tetanus (Common Redshank)	MI	MI		Found at sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand). They are also found around saltlakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms.	Low	Low
Gelochelidon nilotica (Gull-billed Tern)	MI	MI		Shallow sheltered seas close to land, estuaries, tidal creeks, near-coastal salt lakes, samphire flats, swamps, lagoons, river pools, claypans, dams and over grain crops.	Low	Low
Hydroprogne caspia (Caspian Tern)	MI	MI		Mainly sheltered seas, estuaries and tidal creeks.	Low	Low
Apus pacificus (Fork-tailed Swift)	MI	MI		Largely aerial species independent of the terrestrial environment.	Moderate	High
Falco hypoleucos (Grey Falcon)		VU		Open habitats: semi-deserts, grassy inland plains, timbered watercourses, pastoral lands.	High	High
Falco peregrinus (Peregrine Falcon)		OS		Cosmopolitan, will hunt in any habitat, soaring at height or from a perch; often near cliffs. Nests on rocky ledges in tall, vertical cliff faces and tall trees associated with drainage lines.	High	High

Scientific name (common name)	Conservation codes			Preferred habitat	Likelihood of occurrence	
	EPBC Act	BC Act	DBCA		Pre-survey	Post survey
Pezoporus occidentalis (Night Parrot)	EN	CR		Most habitat records are from *Triodia* grasslands and/or chenopod shrublands in the arid and semi-arid zones. *Astrebla* spp. (Mitchell grass), shrubby samphire and chenopod associations, scattered trees and shrubs, *Acacia aneura* (Mulga) woodland, treeless areas and bare gibber as associated with sightings of the species.	Low	Low
Polytelis alexandrae (Princess Parrot)	VU		P4	Inhabits sand dunes and sand flats in the arid zone. Occurs in savanna woodlands and shrublands that usually consist of scattered stands of *Eucalyptus* spp, Casuarina/Allocasuarina trees, an understorey of shrubs and a ground cover dominated by *Triodia* spp.	Low	Low
Hirundo rustica (Barn Swallow)	MI	MI		Coastal open country generally, especially near surface water and man-made structures such as bridges and power wires.	Low	Low
Motacilla flava (Yellow Wagtail)	MI	MI		Mainly banks and rocks in fast-running freshwater habitats such as rivers, creeks, streams and around waterfalls.	Low	Low
Motacilla cinerea (Grey Wagtail)	MI	MI		Damp short-grass flats, rice stubbles and edge of swamps, sewage ponds, bore overflows, grazed or mowed grass and irrigated areas.	Low	Low
Mammals						
Dasycercus blythi (Brush-tailed Mulgara, Ampurta)			P4	Common in a range of habitats – tussock / hummock grasslands and sparse shrubs and low open woodlands on ridge tops, cliffs, scree slopes, hills and valley floors.	Low	Low
Dasyurus hallucatus (Northern Quoll)	EN	EN		Northern Quoll habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal.	High	High
Sminthopsis longicaudata (Long-tailed Dunnart)			P4	Found in rocky scree and plateau areas, generally with little vegetation or in areas of spinifex hummock grassland, shrubs and open woodland.	Low	Low

Scientific name (common name)	Conservation codes			Preferred habitat	Likelihood of occurrence	
	EPBC Act	BC Act	DBCA		Pre-survey	Post survey
Macrotis lagotis (Greater Bilby, Dalgyte)	VU	VU		Sand or sandy-loam in hummock grassland (*Triodia* species) and or *Acacia* shrublands.	High – previously recorded within survey area	Low
Petrogale lateralis lateralis (Black-footed Rock-wallaby)	EN	EN		Occurs in cliffs, rock-piles, talus or escarpment refuge and other steep substrates with grassland feeding habitat nearby. Also occurs on limestone outcrops, coastal cliffs and granite outcrops.	Low	Low
Pseudomys chapmani (Western Pebble-mound Mouse)			P4	Gentle rocky slopes, hills and spurs with small pebble surface cover and sparse vegetation.	High – previously recorded within survey area	Recorded
Leggadina lakedownensis (Short-tailed Mouse)			P4	Open tussock and hummock grassland, Acacia shrubland and savanna woodland on alluvial clay / sandy soils. Cracking clays.	Moderate	Low
Rhinonicteris aurantia (Pilbara form) (Pilbara Leaf-nosed Bat)	VU	VU		Roosts in deep warm, humid caves or rock cracks, especially in proximity to water pools. Forages while flying low along watercourses and gorges and over *Triodia* grassland.	High - previously recorded within survey area	High
Macroderma gigas (Ghost Bat)	VU	VU		A wide range from rainforest, monsoon and vine scrub in the tropics to open woodlands and arid areas.	High – previously recorded within survey area	Recorded

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The area proposed to be cleared contains locally significant flora, fauna, habitats, assemblages of plants. A portion of the application area is mapped as the ''West Angelas cracking-clays'' and Coolibah-lignum flats: *Eucalyptus victrix* over lignum community in the Pilbara (Coolibah and mulga (*Acacia aneura*) woodland over lignum and tussock grasses on	At variance	Yes *Refer to Section 3.2.1, above.*

Assessment against the clearing principles	Variance level	Is further consideration required?
clay plains (Coondewanna Flats and Wanna Munna Flats) subtype)' priority ecological communities (PECs) (Astron, 2022). There are 21 species of priority flora recorded within the application area (Astron, 2022). The application area also supports fauna species of conservation significance.		
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."* Assessment: The area proposed to be cleared contains foraging, roosting, and potential breeding habitat for conservation significant fauna.	At variance	Yes *Refer to Section 3.2.2, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain habitat for flora species listed under the BC Act.	Not likely to be at variance	No
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."* Assessment: There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database). A flora and vegetation survey of the application area did not identify any TECs (Astron, 2022).	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
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."* Assessment: The extent of the mapped vegetation type is consistent with the national objectives and targets for biodiversity conservation in Australia (GIS Database). The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.	Not at variance	No
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."* Assessment: There are no conservation areas within the application area. The nearest DBCA managed land is the former Juna Downs Pastoral Lease which is located approximately 36 kilometres northwest of the application area (GIS Database). The application area is not part of an ecological linkage to this conservation area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area.	Not likely to be at variance	No
Environmental value: land and water resources		
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."* Assessment: There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). There are numerous minor ephemeral watercourses within the permit boundary (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall.	At variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
The vegetation unit D13 may represent a groundwater dependent ecosystem as it is dominated by the facultative phreatophyte *Eucalyptus victrix* and occurs on a soak/drainage depression habitat (Astron, 2022). The applicant has committed to avoiding clearing this vegetation unit. In respect to fauna habitat, drainage habitat is often restricted at a local level and has the potential to support larger trees which can be used for roosting and nesting. They also often have more abundant leaf litter and looser soil which supports more burrowing animals. Whilst riparian vegetation is restricted in the local area, drainage lines are common in the surrounding region and the proposed clearing is not likely to clear a significant amount of this vegetation. Conditions To address the above impacts, the following management measures will be required as conditions on the clearing permit: • Avoidance of clearing within vegetation unit D13; • A watercourse management condition requiring that surface water flows are not impacted by the proposed clearing.		
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The application area lies within the Boolgeeda, Newman, Platform, Rocklea, Spearhole and Wannamunna land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development). Excluding the Wannamunna land system, all of the land systems within the permit area are generally not prone to erosion (Van Vreeswyk et al., 2004). The Wannawunna land system generally has a low susceptibility to erosion however, the system is prone to degradation if grazing pressure is excessive (Van Vreeswyk et al., 2004). Disturbances to overland flow processes by inappropriate positioning or construction of infrastructure such as roads can have adverse effects on vegetation (Van Vreeswyk et al., 2004). Provided the clearing is not concentrated in one area, the proposed clearing of 1,500 hectares across a permit area of approximately 42,823 hectares is not likely to cause appreciable land degradation. Potential impacts from land degradation may be minimised by the implementation of a rehabilitation condition.	Not likely to be at variance	No
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."* Assessment: There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear, however, there are numerous minor ephemeral watercourses within the permit area (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows. The groundwater salinity of the permit area has been broadly mapped as being 500 - 1,000 milligrams per litre total dissolved solids (GIS Database). The depth of the groundwater in the area is not known, however, the proposed clearing of 1,500 hectares within a larger boundary of approximately 42,823 hectares is unlikely to cause deterioration in the quality of underground water.	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (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."* Assessment: There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.	Not likely to be at variance	No

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 for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E. Biological survey information excerpts

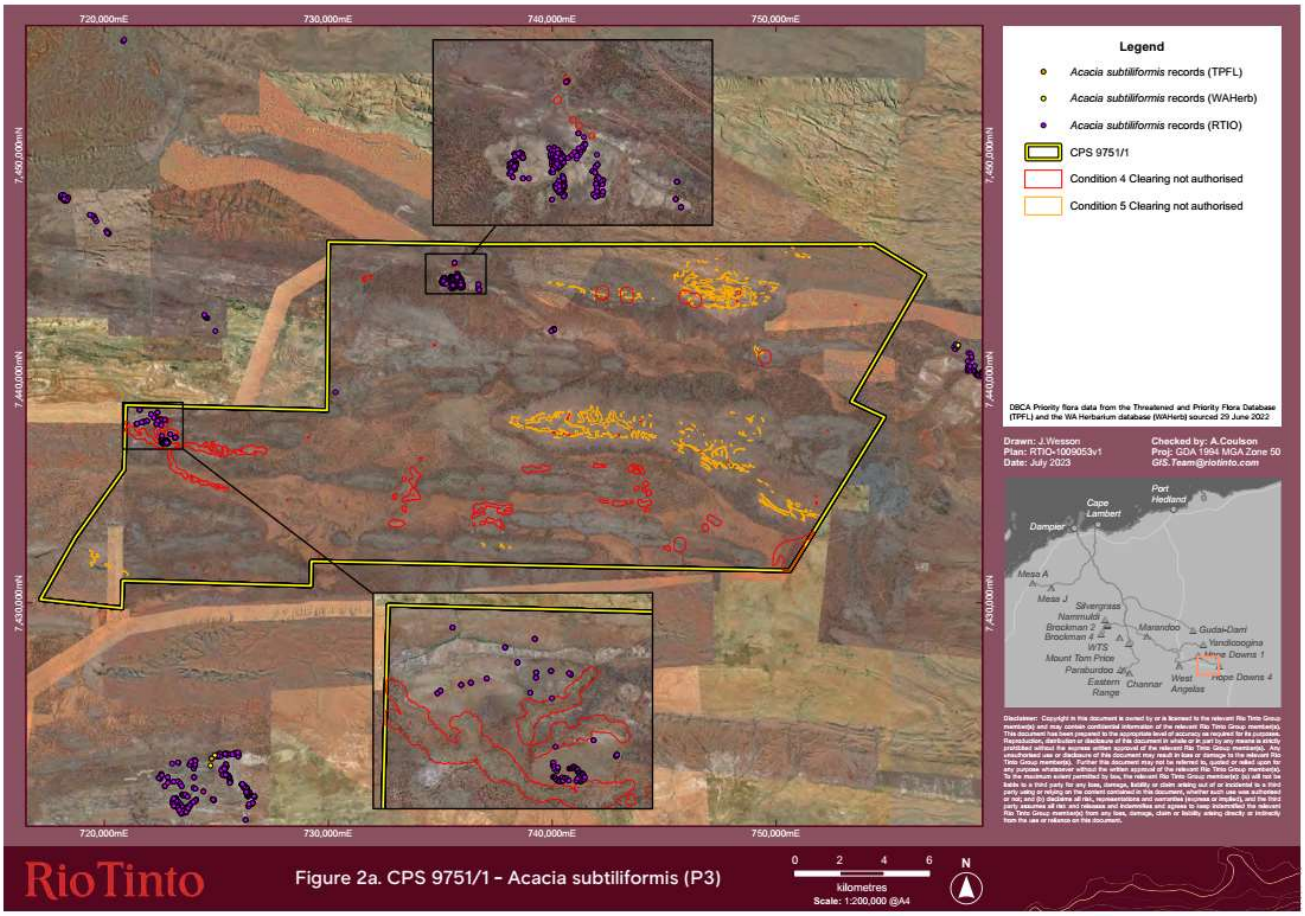

Figure 1: *Acacia subtiliformis* records within the application area.

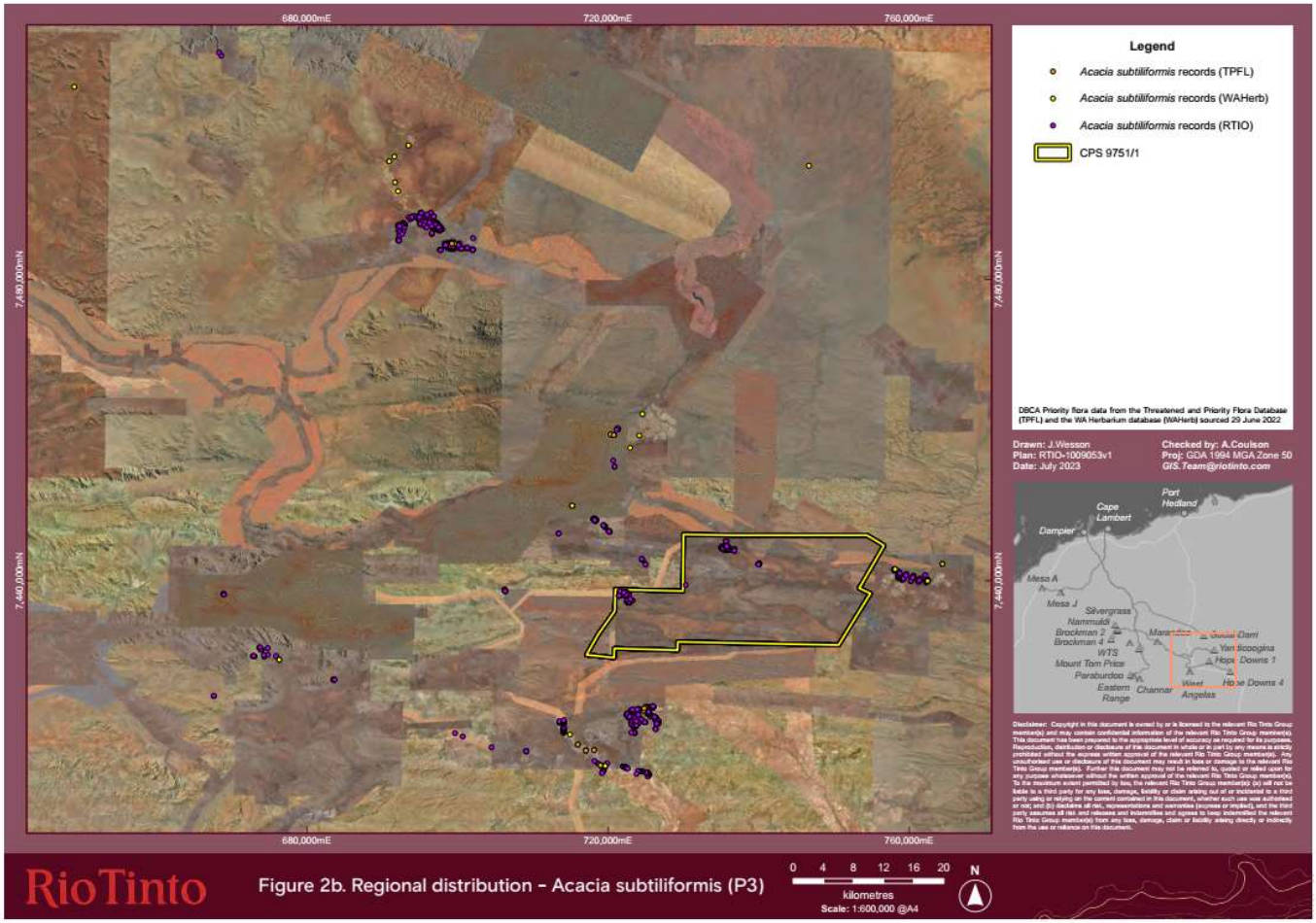

Figure 2: *Acacia subtiliformis* regional distribution.

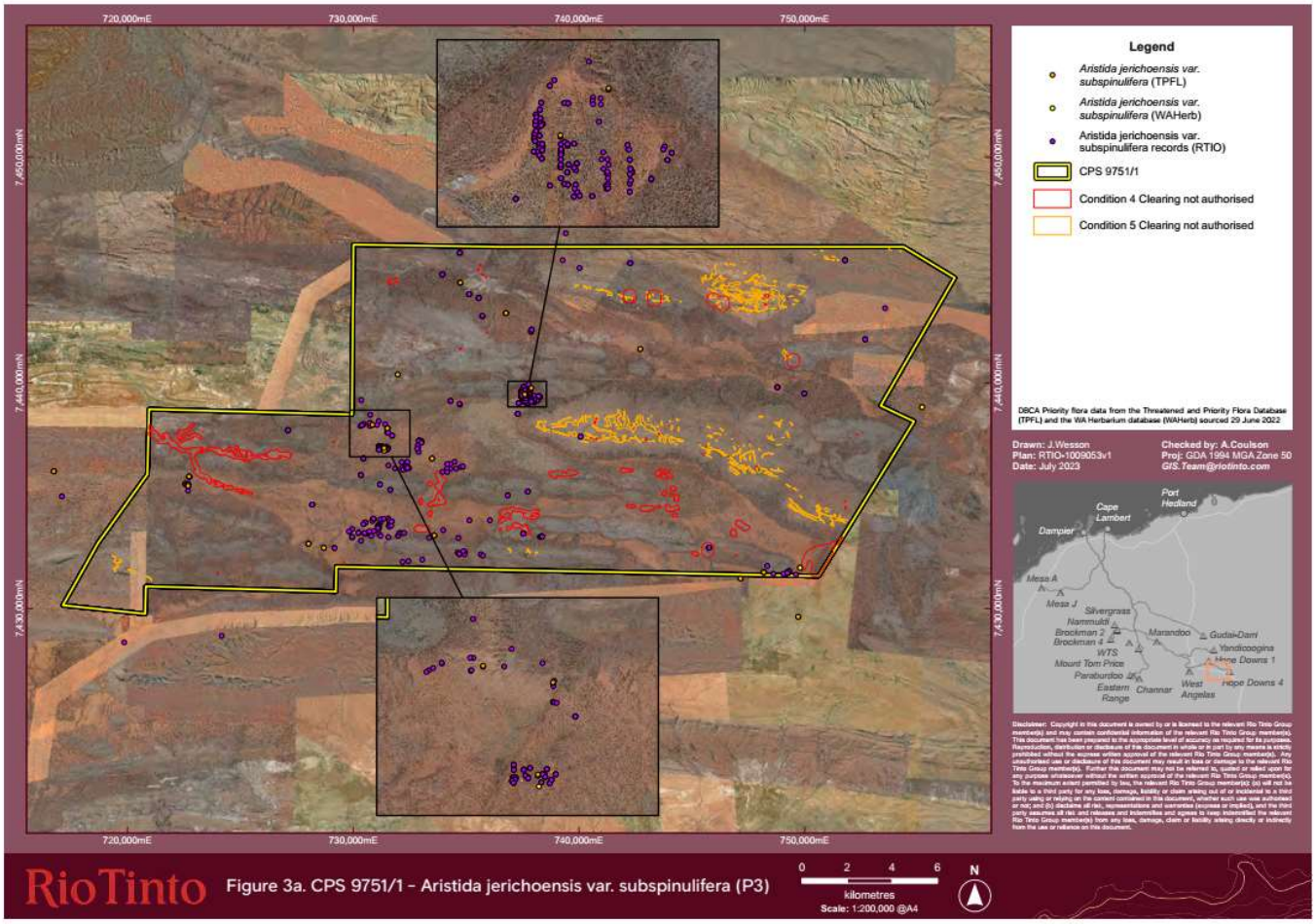

Figure 3: *Aristida jerichoensis* var. *subspinulifera* records within the application area.

Figure 4: *Aristida jerichoensis* var. *subspinulifera* regional distribution.

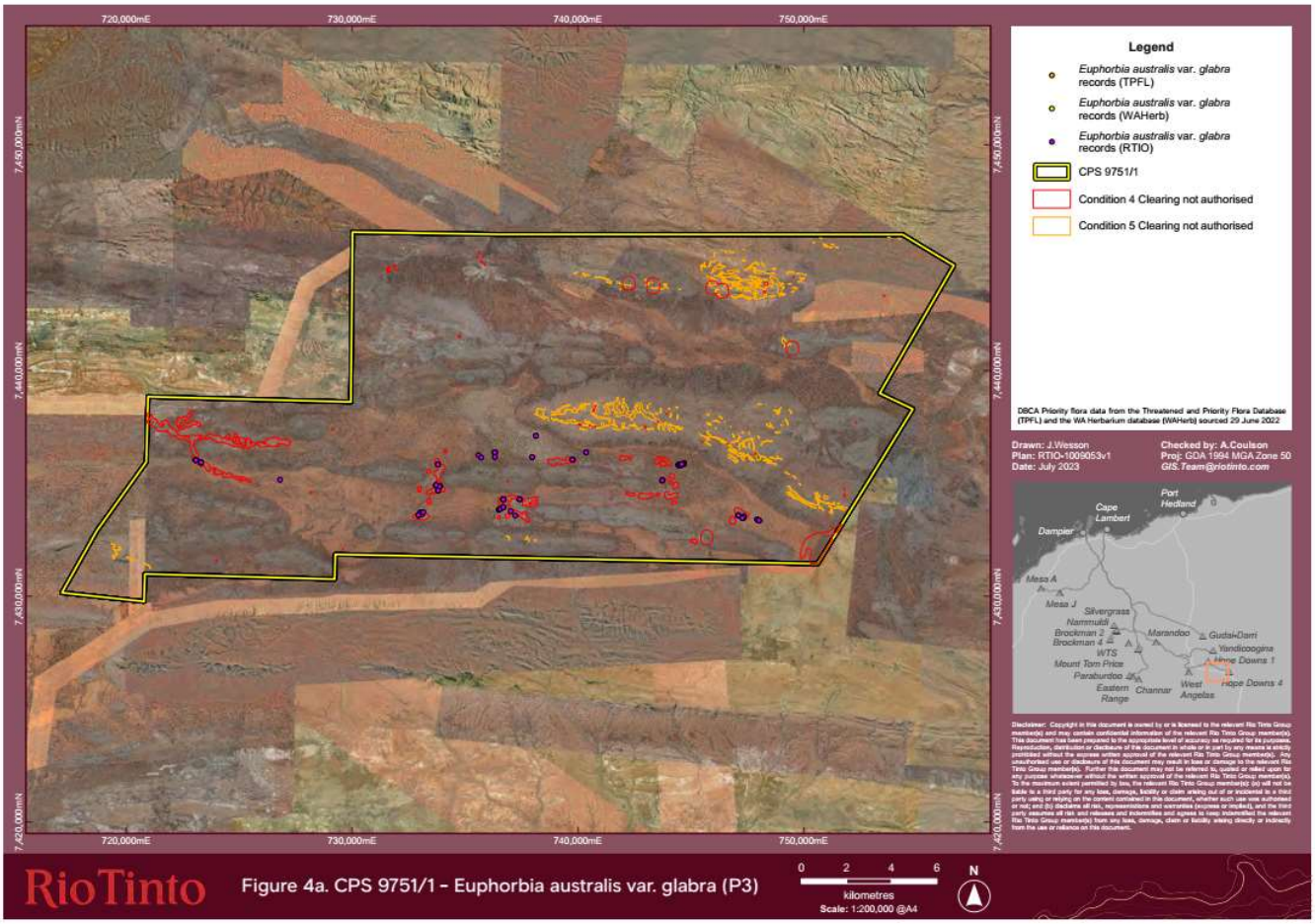

Figure 5: *Euphorbia australis* var. *glabra* records within the application area

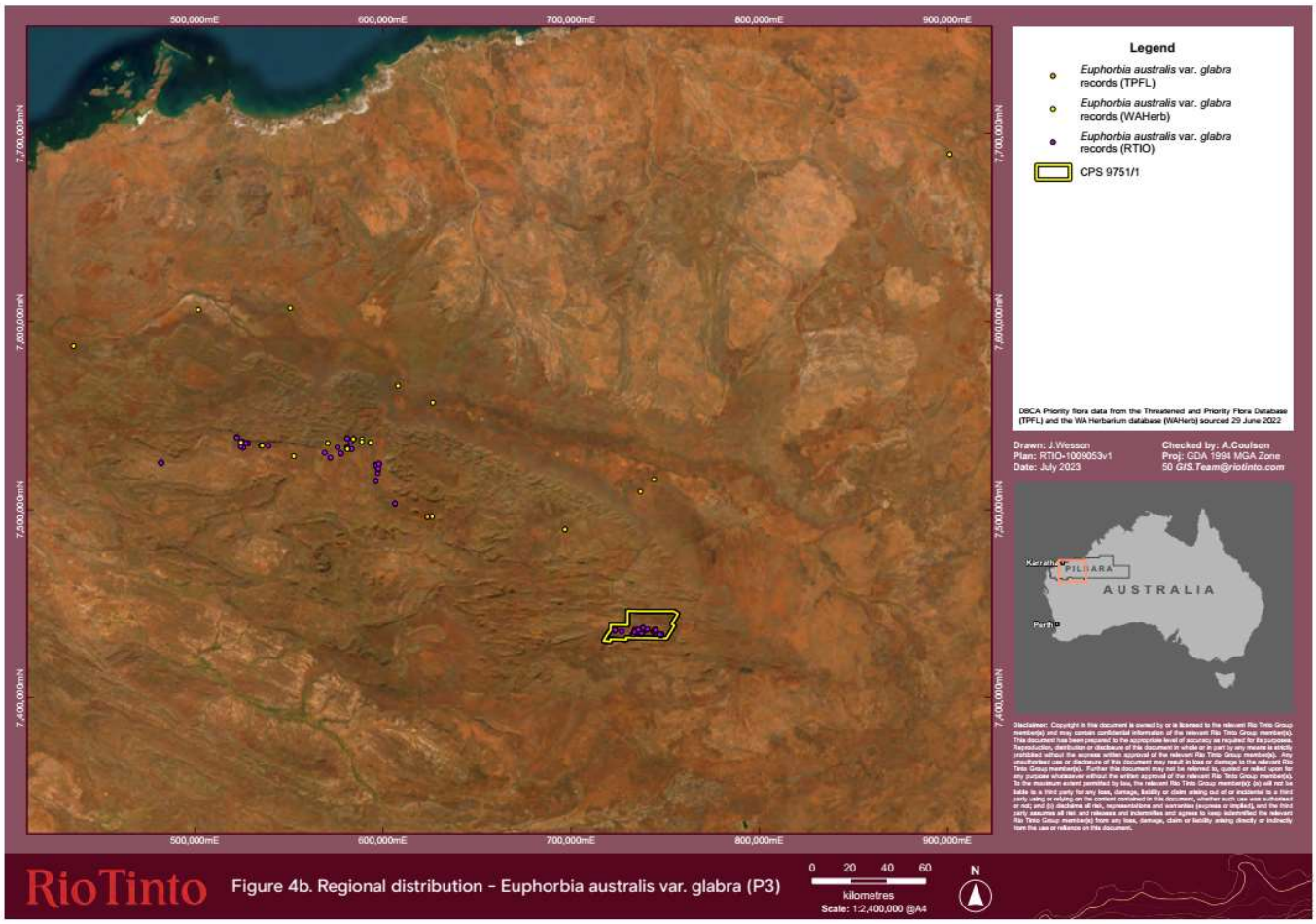

Figure 6: *Euphorbia australis* var. *glabra* regional distribution.

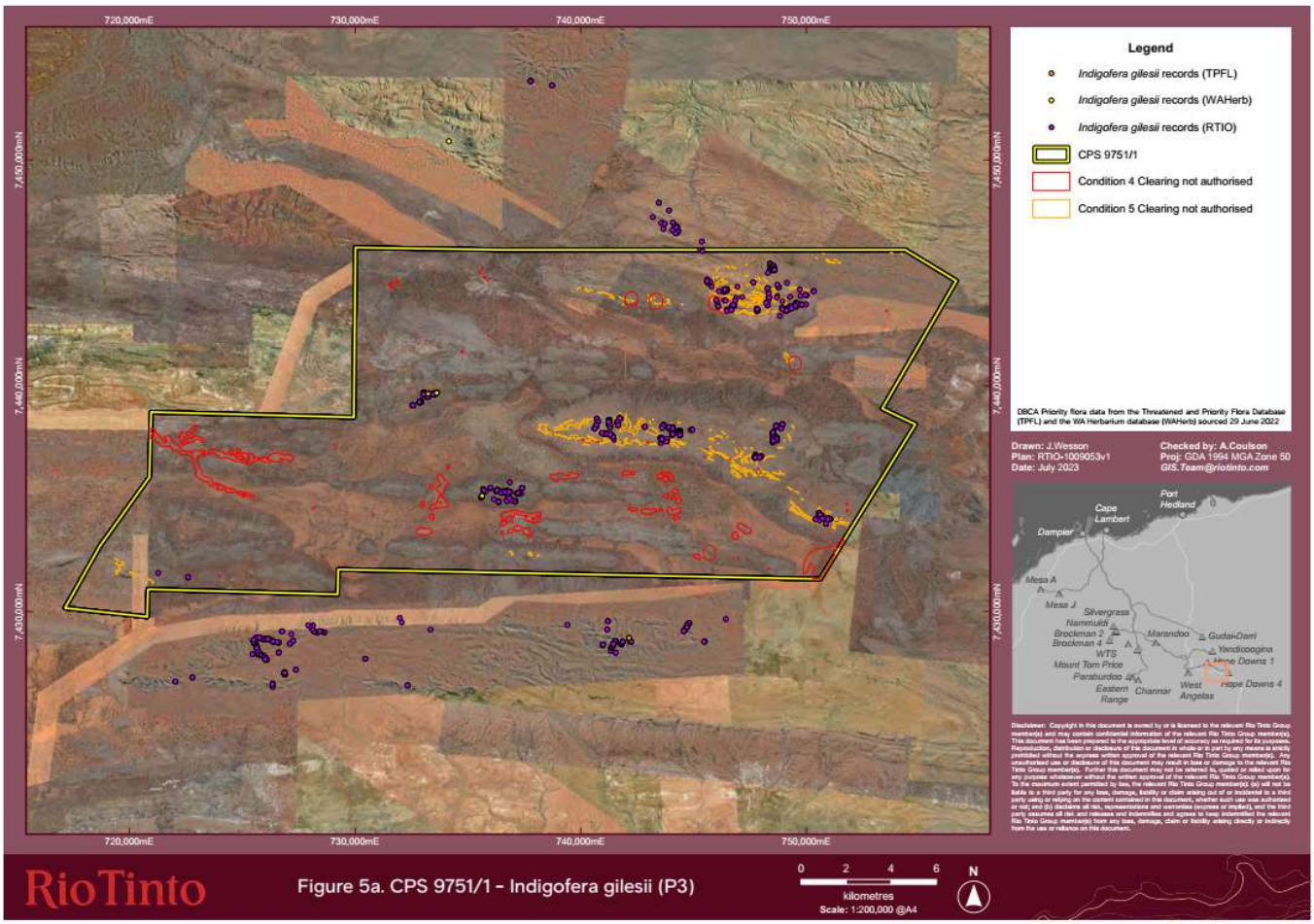

Figure 7: *Indigofera gilesii* records within the application area.

Figure 8: *Indigofera gilesii* regional distribution.

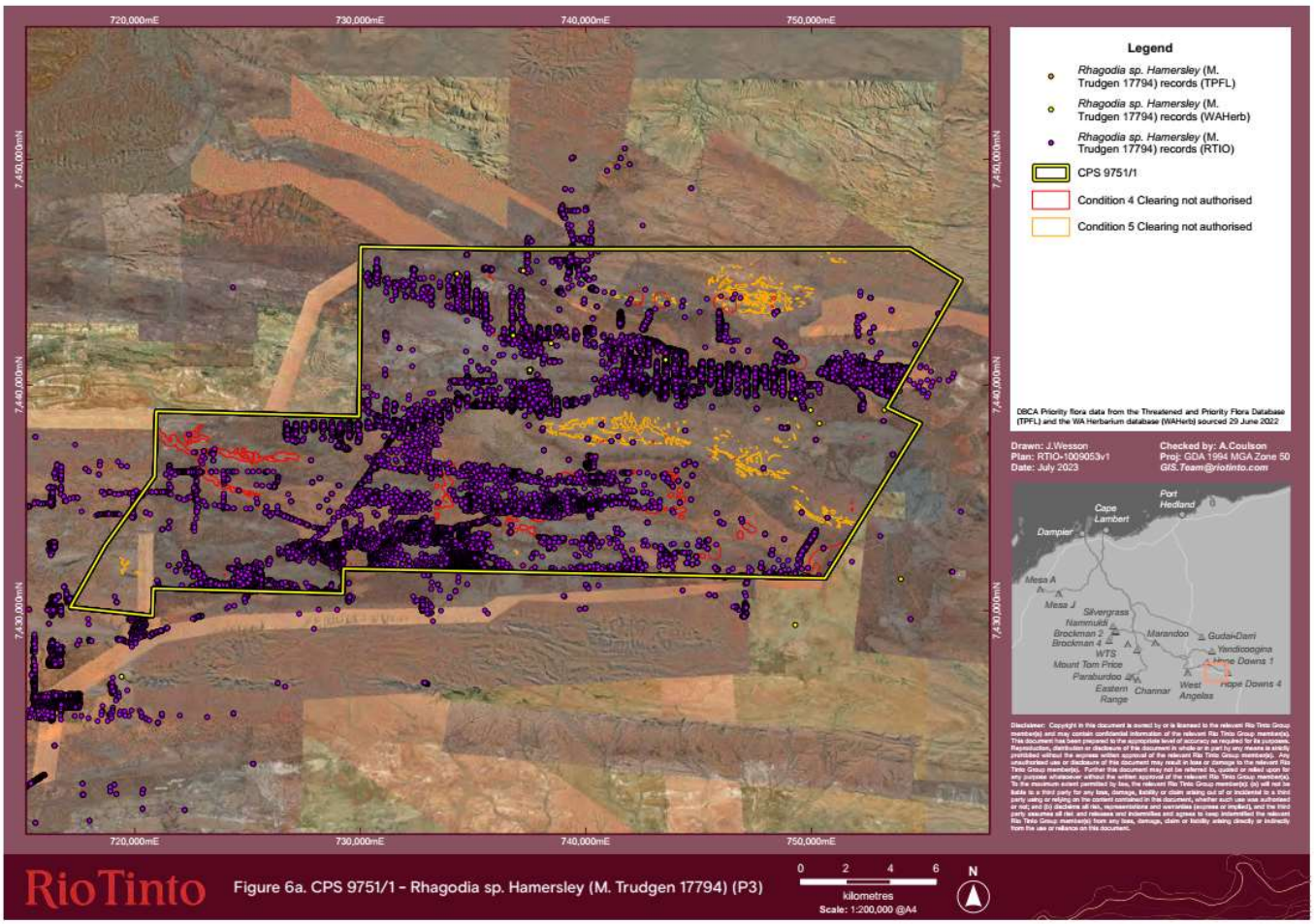

Figure 9: *Rhagodia* sp. Hamersley records within the application area.

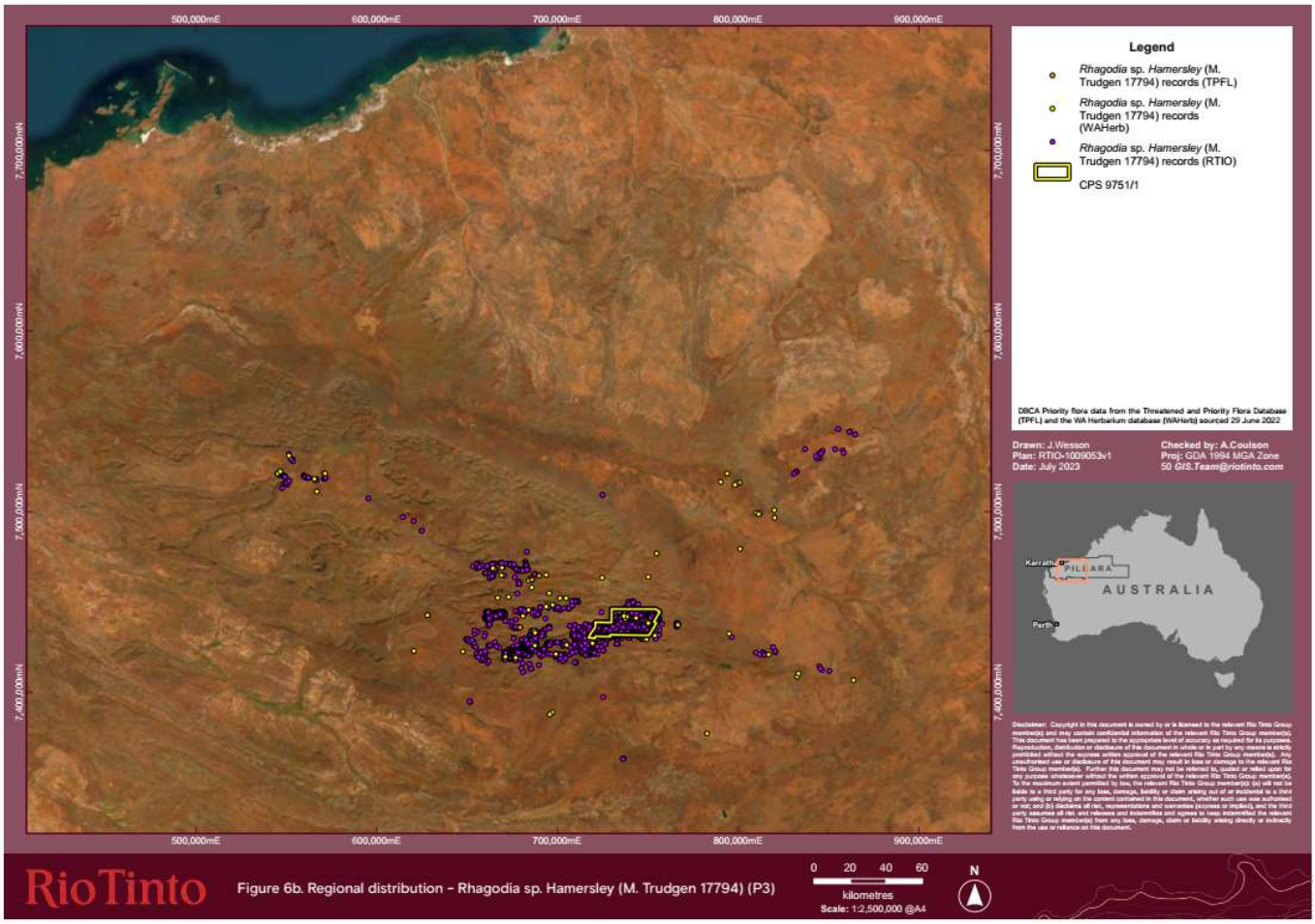

Figure 10: *Rhagodia* sp. Hamersley regional distribution.

Appendix F. Sources of information

F.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)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- 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)

F.2. References

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Rio Tinto (2023) Technical Memo – CPS 9751/1 Supplementary information – priority and threatened fauna habitat. Prepared by Rio Tinto, July 2023.

Schoknecht, N., Tille, P. and Purdie, B. (2004) Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs Resource Management Technical Report No. 280. Department of Agriculture.

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.

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4. Glossary

Acronyms:

BC Act	*Biodiversity Conservation Act 2016,* Western Australia
BoM	Bureau of Meteorology, Australian Government
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	*Environmental Protection Act 1986*, Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (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	*Rights in Water and Irrigation Act 1914*, 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.