



Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 10408/1
Permit type:	Purpose permit
Applicant name:	Robe River Mining Company Pty Ltd
Application received:	13 November 2023
Application area:	8 hectares of native vegetation within a clearing footprint of 15.89 hectares
Purpose of clearing:	Clearing for access tracks and undertaking maintenance works upon the West Angelas monitoring bore legacy network within Karijini National Park.
Method of clearing:	Mechanical clearing
Property:	Lot 301 on Plan 72977
Location (LGA area/s):	Shire of Ashburton
Localities (suburb/s):	Karijini

1.2. Description of clearing activities

The vegetation proposed to be cleared is contained within a single contiguous area (see Figure 1, Section 1.5). The proposed clearing is required to allow safe access to the West Angelas monitoring bore legacy network within Karijini National Park (KNP). Access to the well network is required to refurbish/monitor and manage potential drawdown effects on KNP and provide data for ongoing groundwater modelling.

Clearing is required for:

- vehicle access to monitoring bores, via existing tracks;
- existing track maintenance and vegetation regrowth removal;
- washout repairs; and
- access for bore maintenance, including bore remediation, decommissioning and abandonment, and fire protection works in the area adjacent to the existing bores.

The application was revised during assessment based on advice received from the Department of Biodiversity, Conservation and Attractions (DBCA). The changes to the application are addressed in Section 3.

1.3. Decision on application

Decision:	Granted
Decision date:	6 September 2024
Decision area:	7.4 hectares of native vegetation within a clearing footprint of 15.89 hectares, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), the findings of the biological survey (see Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3).

The assessment identified that the proposed clearing will result in:

- the loss of 58 individual *Eremophila pusilliflora* (Priority 2) plants,
- the loss of two individual *Goodenia* sp. East Pilbara (A.A. Mitchell PRP) (Priority 3) plants,
- the loss of native vegetation that is suitable habitat for the Grey Falcon (*Falco hypoleucos*), Fork-tailed Swift (*Apus pacificus*), Ghost Bat (*Macroderma gigas*), Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia*) and Peregrine Falcon (*Falco peregrinus*), as well as potential direct impacts to fauna utilising the application area during the time of clearing,
- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values for conservation significant flora and fauna, and riparian communities.

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 is unlikely to have long-term adverse impacts on the persistence of priority flora at the regional, and species level. The proposed clearing is also unlikely to result in significant adverse impacts to fauna habitat 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
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- to ensure the clearing of *Eremophila pusilliflora* and *Goodenia* sp. East Pilbara (A.A. Mitchell PRP) is limited to the individual plants recorded within the application area during the local flora survey.

1.5. Site map

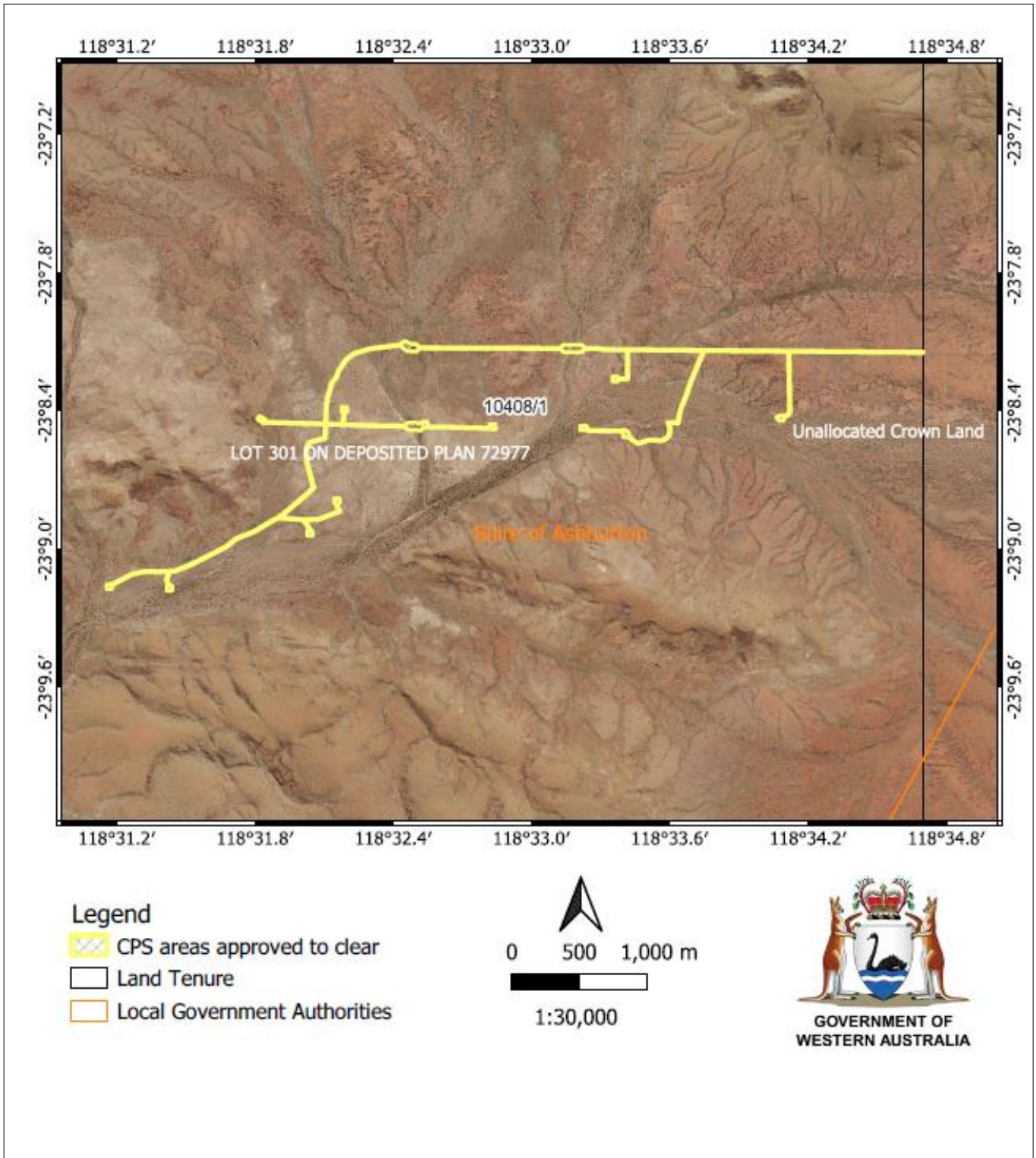


Figure 1 Map of the application area

The area cross-hatched yellow indicates the area authorised to be cleared 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)*

The key guidance documents which inform this assessment are:

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

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Applicant has reduced and amended the application area from 8 hectares to 7.4 hectares to align with the section 101 licence footprint and avoid any unnecessary clearing. Further avoidance and mitigation measures proposed by the applicant include:

- using existing tracks where possible. Works will only occur within existing windows. Additionally, no drive around of obstacles is permitted and no driving off track
- progressive rehabilitation shall occur as soon as practicable at the end of drilling activities with consideration given to timing of rehabilitation due to seasonality changes.
- rehabilitation material (including topsoil) removed by clearing is collected and stored.
- where tracks remain open for access, it is anticipated that all remaining rehabilitation of these areas to occur no later than 6 months of section 101 licence expiry.
- rehabilitation of abstraction bores or bores that intersect more than one aquifer will be backfilled using packers and cement grout, or bentonite seal to prevent contamination or mixing of water between aquifers. Drill holes within confined aquifers will be sealed to prevent uncontrolled discharge to the surface.
- remedial earthworks will be undertaken if monitoring determines that regeneration of disturbed areas is unlikely to achieve the species composition, structure, and density comparable to adjacent undisturbed reference areas.
- rehabilitation of tracks and other disturbances shall be conducted in accordance with the Environmental Management Plan (EMP).

In situations where the applicant anticipates that there may be a potential need to overcome issues such as washouts, creek crossing degradation or obstacles that prevent use of existing access tracks, DBCA will be consulted and the best option to overcome the issue will be discussed and agreed with DBCA (Rio Tinto, 2024).

Considering the above, the Delegated Officer was satisfied that the applicant has committed to reasonable measures to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) 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 (see Appendix C) identified that the impacts of the proposed clearing present a risk to biological values (fauna habitat and adjacent flora), conservation areas, and water resources. 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 - Clearing Principles (a), (b) and (c)

Assessment

Fauna habitat

The desktop assessment identified that there are 17 conservation significant fauna species within a 50-kilometre radius of the application area.

A fauna habitat survey was undertaken simultaneously with the flora and vegetation survey (AECOM, 2023). A fauna habitat assessment was completed within each of the defined fauna habitats as informed by on-ground observations and vegetation community mapping. The survey focused on confirming habitat suitability for conservation significant fauna species identified during the desktop assessment, predominantly cave systems and significant landforms.

Three fauna habitat types (excluding areas of cleared land) have been mapped during AECOM's survey (2023). These fauna habitats include:

- Hummock Grassland: grasslands on rocky undulating terrain with sparse litter and open to sparse shrub and tree cover. Minimal to no logs present. Includes areas with calcrete and quartz. Soils are skeletal to clay loam with rocks on surface.
- Major and Minor Drainage: Ephemeral creeks that intersect existing railway. Includes mature trees in varying densities with some hollows, some logs of moderate size, and moderate density groundcover of tussock grasses, herbs, and shrubs. Soils are grey to red and include river stones and pebbles. Leaf litter is medium to high on banks, and sparse in the riverbed.
- Mulga on Clay Flats: Red clay flats with stands of Mulga and open bare ground often with a gravelly surface. Understorey density includes tussock and hummock grasses at varying densities. Leaf litter medium to high under Mulga, interspersed with sparse open ground.

Fauna occurrence likelihood

Based on the AECOM survey information and DWER's assessment, the following fauna species are likely to utilise the following habitats:

The Ghost Bat, *Macroderma gigas* (Vulnerable), is known from the local area, with 172 DBCA records and more than 7,000 Rio Tinto records known from within 50 kilometres. The species distribution is discontinuous, with populations occurring in the Pilbara, Kimberley, northern Northern Territory, the Gulf of Carpentaria coastal and near coastal eastern Queensland, and Western Queensland (DAWE, 2016). Several records are less than 10 kilometres away from the application area including direct sightings and indirect evidence (scats) (AECOM, 2023). Given the proximity of the survey area to suitable roosting habitat (caves, rock crevices), all habitat within and surrounding the survey area is considered suitable foraging habitat but not critical to the survival of the species.

The Pilbara Leaf-nosed Bat, *Rhinonictis aurantia*, (Vulnerable) is considered to have a high likelihood of occurrence as there are 87 DBCA records in the vicinity of the application area, including records within 20 kilometres and the previous 20 years. The Pilbara Leaf-nosed Bat roosts in caves and old mine shafts which were not recorded within the survey area. However, given the proximity of the survey area to known roosting sites it is likely to forage in the survey area (AECOM, 2023). Habitat in the survey area is homogenous with the adjacent habitat. The species is unlikely to rely on habitat in the survey area for its survival.

The Western Pebble-mound Mouse, *Pseudomys chapmani*, is a Priority 4 mammal which is endemic to the Pilbara region. Habitat for this species can be found on stony hillsides with hummock grasslands in the survey area. AECOM survey (2023) did not record pebble mounds, however, given the significant number of records in the vicinity (298 DBCA records, 80 Rio Tinto records), it is still considered likely to occur.

The Grey Falcon, *Falco hypoleucos*, is listed as Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act). Grey falcons are limited to the arid and semi-arid zones of Australia, west or north of the Great Dividing Range from Queensland to Victoria, northern South Australia, and the northern regions of Western Australia (BirdLife International, 2024). The Grey Falcon has suitable foraging habitat within all three fauna habitats located within the application area. As the fauna habitats are well represented within the surrounding areas of the application area, it is not expected that the proposed clearing will result in a significant residual impact to the Grey Falcon on a local or regional scale.

The Peregrine Falcon (*Falco peregrinus*) and Fork-tailed Swift (*Apus pacificus*) are known migratory birds recorded within the local area of the application area, each with multiple known records. These migratory species have quite a broad habitat range and have habitat suitability across all three fauna habitats located within the survey area (AECOM, 2023). These bird species are expected to fly over and forage within the survey area habitats. These fauna habitats are well represented within the surrounding areas and as such these species are unlikely to rely on this habitat as critical habitat. Therefore, it is unlikely that the proposed clearing will result in a significant residual impact on Peregrine Falcon or Fork-tailed swift populations at a local or regional scale.

Flora assessment

The desktop assessment recorded 51 conservation significant flora species within the local area (50-km from the centre of the application area).

A reconnaissance flora and vegetation survey was conducted by AECOM (2023) between 21 to 24 March 2022. The application area lies within the study area. Two conservation significant flora species were identified during the survey:

- *Eremophila pusilliflora*
- *Goodenia* sp. East Pilbara (A.A. Mitchell PRP)

Eremophila pusilliflora is a priority 2 (P2) flora species which was identified extensively throughout the survey area and surrounds during the biological survey (AECOM, 2023). It is a low-growing, open shrub to 50 centimetres high, found on seasonally inundated alluvial plains between Turee Creek, Pingandy Creek and drainage systems leading into the Ashburton River. This species grows in association with drainage lines therefore may be impacted by dewatering associated with mining activities. *E. pusilliflora* grows in red-brown sandy loam soils in open low shrubland with *Acacia aneura*, *Ptilotus nobilis*, *Goodenia* and *Triodia* species.

This species is known from approximately 14 locations in a relatively narrow geographic range (estimated extent of occurrence is approximately 7,300 square kilometres). There are three records within Karijini National Park. The total number of plants is unknown as many records do not have verified quantitative data (DBCA, 2024).

The flora survey (AECOM, 2023) recorded 58 individuals of this species within the proposed application area (i.e. approximately 2 per cent of the plants recorded in the study area). Given the reported abundance of this species within and around the study area, the impacts of the clearing are unlikely to be significant at the local scale or impact the conservation of this species (DBCA, 2024).

Goodenia sp. East Pilbara (A.A. Mitchell PRP) is a Priority 3 species listed under the BC Act. It is open, erect annual or biennial, herb, to 0.2 metres high. This species is found on red-brown clay soil and calcrete pebbles on low undulating plain. It was tentatively identified in two locations throughout the survey (AECOM, 2023), but was not able to be confidently identified in the field due to lacking suitable flowering material. The flowering period of this species is unknown and is expected to coincide with rainfall events. The date of the field survey appeared to be inadequate to record this species. Due to the limited information on this flora species and the inability to confidentially identify this species from material in the field, expert advice on the probability of the field records being of *Goodenia* sp. East Pilbara (A.A. Mitchell PRP) was sought. The two collections were made on calcrete and therefore considered likely to represent the Priority 3 species.

Goodenia sp. East Pilbara (A.A. Mitchell PRP) is known from populations within the Shires of Ashburton, East Pilbara and Meekatharra. DBCA (2024) has advised that the population records are estimated to be over 3,600 plants. Given the linear nature of the survey and its location within the known distribution of this species, any potential impact is unlikely to be significant to the conservation of this species (DBCA, 2024). The proposed works within the application area are to be contained within existing windrows, on previously disturbed ground and the potential impact to the species is therefore considered to be low to negligible (AECOM, 2023).

It is unlikely that any of the taxa listed with 'potential' to occur within the survey area, would solely rely on the habitats within the application area for survival. Due to the small size of the application area relative to the surrounding intact vegetation which is in excellent (Trudgen, 1991) condition, it is considered unlikely that the proposal clearing will negatively impact any of these conservation significant species, on either a local or regional scale.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on adjacent fauna habitats and Priority flora occurrences can be managed by taking steps to minimise the risk of the introduction and spread of weeds and conducting slow, directional clearing to allow fauna to move into adjacent vegetation. Implementation of these management measures would ensure that the clearing does not constitute a significant residual impact.

Conditions

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

- Fauna management - slow, progressive, directional clearing to be undertaken to allow fauna to move into adjacent vegetation ahead of the clearing activity to minimise impact to individuals.
- Flora management –demarcation of the clearing area prior to clearing to ensure that the clearing of *Goodenia* sp. East Pilbara (A.A. Mitchell PRP) and *Eremophila pusilliflora* is limited to the individual plants recorded within the defined clearing boundary during the flora survey, and
- Weed control, which ensures protocols are put in place to limit the introduction and transportation of weed affected material.

3.2.2. Conservation areas - Clearing Principle (h)

Assessment

The proposed application area is mapped within Karijini National Park. Due to the small, localised scale of the application area and low impact of the proposed works in an existing infrastructure corridor, it is considered unlikely the clearing will negatively impact this conservation area. The proposed works within the application area are to be contained within existing windrows and largely the existing disturbance footprints and impact is therefore considered to be low to negligible (AECOM, 2023).

Ecological linkages of vegetation between larger areas of conservation value will not be impacted by the clearing noting the continuous and large patches of remnant vegetation adjacent to the application area.

Applicant has prepared an Environmental Management Plan (EMP) in accordance with the section 101 licence conditions which aims to reduce the environmental impact of the proposed works within the important conservation area (Rio Tinto, 2023). The EMP addresses impacts such as

- ground disturbance and land clearing
- hydrocarbon and chemical management
- non-mineral waste management
- weed management
- discharge management
- rehabilitation

A full description of the management of risks is provided in Section 3.1 of the Decision Report.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on the conservation values of Karijini National Park can be managed to an environmentally acceptable standard through proper management techniques as outlined in the EMP (Rio Tinto, 2023).

Conditions

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

- Weed management.

3.2.3. Land and water resources - Clearing Principles (f)

Assessment

The application area is mapped within the proclaimed Pilbara Groundwater, Pilbara Surface Water Area. Several minor ephemeral drainage lines transect the application area.

Applicant has proposed management measures to minimise any impacts to the quality and quantity of the surface water, and to minimise any unnecessary disturbances to natural surface drainages. These measures include:

- a licensed water bore driller, utilising appropriate drilling equipment and techniques will be utilised to construct bores.
- approved biodegradable drilling fluids will be utilised.
- all discharge, including cuttings, to be contained within sumps (where practicable) during bore construction.
- in the absence of any regulatory/licenses discharge limits, all discharge is to comply with section 4.3 of the Australian and New Zealand guidelines for fresh and marine water quality.
- test pumping will be conducted as per program specific Discharge Management Plans.
- erosion control measures will be implemented at the discharge point.
- water bores that require disinfection will be disinfected in line with Section 14 of 'Minimum Construction Requirements for Water Bores in Australia'.

The applicant has also proposed rehabilitation of abstraction bores, with bores that intersect more than one aquifer to be backfilled using packers and cement grout or bentonite seal to prevent contamination or mixing of water between aquifers. Drill holes within confined aquifers will be sealed to prevent uncontrolled discharge to the surface (Rio Tinto, 2023).

Noting the above management measures, the purpose and the extent of the clearing is not likely to impact the groundwater-dependent ecosystems.

Conclusion

Based on the above, the proposed clearing will not result in a significant residual impact to watercourses provided the best practice management measures detailed above are adhered to.

Conditions

No management conditions required.

3.3. Relevant planning instruments and other matters

The Shire of Ashburton (the Shire) advised DWER that local government approvals are not required, and that the proposed clearing is exempt from the need for development approval under the Shire's Local Planning Scheme No. 7 by virtue of section 120 of *the Mining Act 1978*. The Shire did not have any objections to the proposed clearing (Shire of Ashburton, 2024).

The Department of Biodiversity, Conservation and Attractions (DBCA) granted a section 101 Licence to Rio Tinto Iron Ore on behalf of Robe River Mining Company Ltd, under the *Conservation and Land Management Act 1984* to undertake access track maintenance and bore refurbishment works within Karijini National Park. The proposed clearing will only be conducted within the section 101 licence boundary.

The Department's North West Region considers the permit proposal unlikely to impact on the quality of water resources, provided clearing activities are undertaken in accordance with the Department's water quality protection notes and guidelines and all environmental management plans relevant to the proposed monitoring activities (DWER, 2024).

No Aboriginal sites of significance have been mapped within the application area. Applicant will be conducting detailed heritage surveys over the application area prior to a ground disturbance activity taking place (Rio Tinto, 2023). The applicant has confirmed its requirements under the *Aboriginal Heritage Act 1972* (WA).

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Response to request for more information included changes to application area and application purpose (Rio Tinto, 2024)	Section 1.2 and Section 1.4

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. The application area lies within the southeast corner of Karijini National Park, approximately 126 km west of Newman in the Shire of East Pilbara.</p> <p>Aerial imagery indicates the local area (50-kilometre radius from the centre of the area proposed to be cleared) retains approximately 99.5 per cent of the original native vegetation cover.</p>
Ecological linkage	The application area is not within any mapped ecological linkage. Given the excellent vegetation condition, the application may contribute to informal ecological linkage function.
Conservation areas	The application area is mapped within DBCA legislated tenure, Karijini National Park.
Vegetation description	<p>A vegetation survey (AECOM, 2023) indicates the vegetation within the proposed clearing area to consist of five vegetation types:</p> <ul style="list-style-type: none"> • AcPIEa - <i>Acacia citrinoviridis</i>, <i>Eucalyptus victrix</i> and <i>Eucalyptus camaldulensis</i> low open woodland over <i>Petalostylis labicheoides</i>, <i>Acacia pyrifolia</i> and <i>Acacia bivenosa</i> tall open shrubland over <i>Eulalia aurea</i>, <i>Eriachne helmsii</i> and <i>Enneapogon lindleyanus</i> low open tussock grassland. • EtAbTw - <i>Eucalyptus trivalva</i>, <i>Acacia macraneura</i> and <i>Acacia pruinocarpa</i> isolated low trees over <i>Acacia bivenosa</i>, <i>Senna artemisioides</i> subsp. <i>oligophylla</i> and <i>Capparis lasiantha</i> mid sparse shrubland over <i>Triodia wiseana</i> and <i>Triodia longiceps</i> low hummock grassland. • SaTw - <i>Senna artemisioides</i> subsp. <i>helmsii</i> x <i>oligophylla/oligophylla</i>, <i>Acacia bivenosa</i> and <i>Acacia sp.</i> mid to low isolated shrubs over <i>Triodia wiseana</i> and occasional <i>Triodia longiceps</i> low hummock grassland. • ApAbTe - <i>Acacia pruinocarpa</i>, <i>Acacia aptaneura</i> and <i>Codonocarpus cotinifolius</i> low open to sparse trees over <i>Acacia bivenosa</i>, <i>Ptilotus obovatus</i> and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> mid to low sparse shrubland over <i>Triodia epactia</i> low hummock grassland. • AmReTI - <i>Acacia macraneura</i> and <i>Acacia pruinocarpa</i> mid isolated trees over <i>Rhagodia eremaea</i> and <i>Acacia tetragonophylla</i> mid to low sparse shrubs over <i>Triodia longiceps</i>, <i>Enneapogon lindleyanus</i> and <i>Themeda triandra</i> low isolated clumps of tussock and hummock grasses. <p>Representative photos and vegetation descriptions are available in Appendix E.</p> <p>This is consistent with the mapped vegetation types:</p> <ul style="list-style-type: none"> • Hammersley 18, which is described as 'low woodland, open low woodland, or sparse woodland. Mulga <i>Acacia aneura</i> and associated species'.

Characteristic	Details
	<ul style="list-style-type: none"> Hammersley 82, which is described as 'low tree-steppe. Hummock grassland with scattered bloodwoods & snappy gum <i>Triodia</i> spp., <i>Corymbia dichromophloia</i>, <i>Eucalyptus leucophloia</i>'
Vegetation condition	<p>Vegetation survey (AECOM, 2023) indicate the vegetation within the proposed clearing area is in excellent (Trudgen, 1991) condition, described as:</p> <ul style="list-style-type: none"> Excellent – pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. <p>The full Trudgen (1991) condition rating scale is provided in D. Representative photos are available in Appendix E.</p>
Climate and landform	<p>The survey area is located in the Shire of Ashburton which experiences a semi-desert climate. On average, the area receives between 250 to 400 millimetres of rain per year (AECOM, 2023).</p>
Soil description	<p>The soils are mapped as:</p> <ul style="list-style-type: none"> Boolgeeda System (285Bg) – stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.\ Table System (285Ta) – low calcrete plateaux, mesas and lower plains supporting mulga and cassia shrublands and minor spinifex grasslands. Platform System (285PI) – Dissected slopes and raised plains supporting shrubby hard spinifex grasslands. Newman System (285Ne) – Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.
Land degradation risk	<p>The mapped soils within the application area are not recorded as being susceptible to land degradation risks.</p>
Waterbodies	<p>The desktop assessment and aerial imagery indicated that the application area proposed to be cleared intersects a minor, non-perennial river, recorded as the Ashburton River.</p>
Hydrogeography	<p>The proposed application area is mapped within the Pilbara Surface Water Area and the Pilbara Groundwater Area. The proposed clearing area is not mapped as being susceptible to flood risk.</p>
Flora	<p>The desktop assessment recorded 51 conservation significant flora species within the local area (50-km radius from the centre of the application centre). Of the recorded species, 44 flora species were recorded within the same soil type, and 46 within the same vegetation type, as that found within the application area. A survey conducted by AECOM (2023) identified two conservation significant flora species within the application area.</p>
Ecological communities	<p>The application area is not mapped within any threatened ecological communities (TEC). The closest TEC is recorded approximately five kilometres North-East of the application area, recorded as Priority 1 (P1) Brockman Iron cracking clay communities of the Hamersley Range.</p>
Fauna	<p>The desktop assessment recorded 17 conservation significant fauna species within the local area. Of the recorded species, eight were listed as priority (P), five were listed as vulnerable (VU), one listed as endangered (EN), and two listed as migratory (MI). The closest mapped fauna species was the Pilbara leaf-nosed bat, approximately 2.2 kilometres from the application area.</p>

B.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information (AECOM, 2023), impacts to the following conservation significant flora required further consideration.

Species name	Conser- vation status	Suitable habitat features ? [Y/N]	Suita- ble veg- etation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]	Number of records identified during the survey (AECOM, 2023)
<i>Eremophila pusilliflora</i>	P2	Y	Y	Y	0	15	Y	58
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	P3	Y	Y	Y	29.5	4	N	2

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

B.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Apus pacificus</i> (Fork-tailed swift)	MI	Y	Y	6.19	40	Y
<i>Falco hypoleucos</i> (Grey falcon)	VU	Y	Y	12.8	n/a	Y
<i>Falco peregrinus</i> (Peregrine falcon)	MI	Y	Y	14.18	n/a	Y
<i>Macroderma gigas</i> (Ghost bat)	VU	Y	Y	10.38	172	Y
<i>Pseudomys chapmani</i> (Western Pebble-mound mouse)	P4	Y	Y	4.10	298	Y
<i>Rhinonicteris aurantia</i> (Pilbara form) (Pilbara Leaf-nose bat)	VU	Y	Y	2.27	87	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p>Principle (a): "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The application area is in very good condition and may provide habitat for conservation significant fauna and is located within a conservation area.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u> The application area may provide habitat for conservation significant fauna. However, noting it is supported by extensive, intact vegetation in excellent (Trudgen, 1991) condition, the proposed clearing of native vegetation will not have a significant impact on habitat for species which are well distributed throughout the Pilbara.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared is unlikely to contain flora species listed as threatened under the BC Act.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u> The area proposed to be cleared does not comprise species that are indicative of a threatened ecological community.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u> The extent of the mapped vegetation type is consistent with the national objectives and targets for biodiversity conservation in Australia. The proposed clearing is not likely to be at variance to this principle.</p>	Not at variance	No
<p><u>Principle (h):</u> <i>“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></p> <p><u>Assessment:</u> Given the application area is located within the Karijini National Park, the proposed clearing will have an impact on the environmental values of a conservation area. However, considering the small, localised scale of the application area and low impact of the proposed clearing in an existing infrastructure corridor, the proposed activities are considered unlikely to negatively impact Karijini National Park.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u> Given a watercourse intersects at several points in the application area, the proposed clearing will impact vegetation growing in association with a watercourse.</p>	At variance	Yes <i>Refer to Section 3.2.3, above.</i>

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</p> <p><u>Assessment:</u></p> <p>The mapped soils are not susceptible to land degradation risks. Noting the location of the application area and the condition of the vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	No
<p><u>Principle (i):</u> “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.”</p> <p><u>Assessment:</u></p> <p>A number of non-perennial watercourses intersect the application area at several points, however, noting the extent and the purpose of clearing, it is unlikely to substantially alter existing water regimes and cause degradation of groundwater-dependent ecosystems. The proposed clearing is unlikely to impact surface or ground water quality.</p>	Not likely to be at variance	No.
<p><u>Principle (j):</u> “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment:</u></p> <p>The mapped soils are not susceptible to flooding (Vreeswyk et al., 2004). Additionally, the scale and purpose of clearing is not expected to exacerbate the incidence or intensity of flooding in the area.</p>	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.

Condition	Description
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

Description	Additional Detail	Photograph
<p>AcPIEa W1</p> <p><i>Acacia citrinoviridis</i>, <i>Eucalyptus victrix</i> and <i>Eucalyptus camaldulensis</i> low open woodland over <i>Petalostylis labicheoides</i>, <i>Acacia pyrifolia</i> and <i>Acacia bivenosa</i> tall open shrubland over <i>Eulalia aurea</i>, <i>Eriachne helmsii</i> and <i>Enneapogon lindleyanus</i> low open tussock grassland.</p> <p>Represents major drainage line and tributaries thereof. Includes patches of *<i>Cenchrus ciliaris</i>. Density of trees varies along creek.</p>	<p>Survey effort: five relevés CGR2, CGR7, CGR8, CGR11, CGR15</p> <p>Species richness: 56 native and 2 weed species</p>	
<p>ETAbTw G1</p> <p><i>Eucalyptus trivalva</i>, <i>Acacia macraneura</i> and <i>Acacia pruinocarpa</i> isolated low trees over <i>Acacia bivenosa</i>, <i>Senna artemisioides</i> subsp. <i>oligophylla</i> and <i>Capparis lasiantha</i> mid sparse shrubland over <i>Triodia wiseana</i> and <i>Triodia longiceps</i> low hummock grassland.</p> <p>On lower slopes and undulating terrain. Soils are rocky and include some calcrete on surface in places.</p>	<p>Survey effort: six relevés CGR3, CGR4, CGR5, CGR9, CGR14, JH02</p> <p>Species richness: 45 native and 1 weed species</p>	

Description	Additional Detail	Photograph
<p>SaTw G2</p> <p><i>Senna artemisioides</i> subsp. <i>helmsii</i> x <i>oligophylla/oligophylla</i>, <i>Acacia bivenosa</i> and <i>Acacia</i> sp. mid to low isolated shrubs over <i>Triodia wiseana</i> and occasional <i>Triodia longiceps</i> low hummock grassland.</p> <p>Recorded on flat to undulating terrain with red clay loam with rocks on surface.</p>	<p>Survey effort: three relevés FDW01, FDW02, JH01</p> <p>Species richness: 26 native species</p>	
<p>ApAbTe G3</p> <p><i>Acacia pruinocarpa</i>, <i>Acacia aptaneura</i> and <i>Codonocarpus cotinifolius</i> low open to sparse trees over <i>Acacia bivenosa</i>, <i>Ptilotus obovatus</i> and <i>Senna artemisioides</i> subsp. <i>oligophylla</i> mid to low sparse shrubland over <i>Triodia epactia</i> low hummock grassland.</p> <p>Associated with floodplains and terraces next to major drainage. Includes gravel surface on red clay loams.</p>	<p>Survey effort: two relevés CGR1, CGR6, CGR10, CGR12 and CGR13</p> <p>Species richness: 53 native species</p>	

Description	Additional Detail	Photograph
<p>AmReTI M1</p> <p><i>Acacia macraneura</i> and <i>Acacia pruinocarpa</i> mid isolated trees over <i>Rhagodia eremaea</i> and <i>Acacia tetragonophylla</i> mid to low sparse shrubs over <i>Triodia longiceps</i>, <i>Enneapogon lindleyanus</i> and <i>Themeda triandra</i> low isolated clumps of tussock and hummock grasses.</p> <p>This community occurs intermittently with open bare areas on red clay loam flats with some small rocks on surface. Includes population(s) of <i>Eremophila pusilliflora</i> (P2).</p>	<p>Survey effort: one relevé FDW3</p> <p>Species richness: 35 native and one weed species</p>	

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)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- 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)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery

- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- 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
- Soil Landscape Mapping – Systems

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)

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