



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6898/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Channar Mining Pty Ltd

1.3. Property details

Property: Iron Ore (Channar Joint Venture) Agreement Act 1987, Mining Lease 265SA (AM 70/265)
Local Government Area: Shire of Ashburton
Colloquial name: Stoney Creek Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
10		Mechanical Removal	Mineral exploration, hydrogeological and geotechnical investigations and associated activities.

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 18 February 2016

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description

The application area has been mapped as the following Beard vegetation association:

82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*.

A Level 1 Flora and Vegetation Survey of the application area was undertaken by Eco Logical Australia in May and August 2015 over the broader Doggers Gorge survey area (survey area approximately 272 hectares) (Rio Tinto, 2016). The proposal is located in a small area of the Doggers Gorge survey area (Rio Tinto, 2015). The flora survey identified the following seven vegetation associations in the application area:

Vegetation of Low Hills, Rises and Valleys:

- **Unit 2** - Low woodland of *Acacia aptaneura*, *Acacia citrinoviridis* and *Corymbia ferritcola* over open shrubland of *Eremophila latrobei* subsp. *latrobei*, *Eremophila fraseri* subsp. *fraseri* and *Hibiscus* sp. Canga over low open shrubland of *Ptilotus obovatus* over very open hummock grassland of *Triodia epactia* over very open tussock grassland of *Eriachne mucronata*.
- **Unit 5** - Open hummock grassland of *Triodia epactia* with occasional emergent scattered shrubs of *Acacia tetragonophylla*, *Acacia aptaneura*, *Acacia pruinocarpa* and *Senna glutinosa* subsp. *glutinosa*.
- **Unit 6** - Low open woodland of *Acacia aptaneura*, *Acacia fuscaneura*, *Acacia rhodophloia*, *Grevillea berryana*, *Acacia pruinocarpa* and *Acacia ayersiana* over open shrubland of *Acacia tetragonophylla*, *Senna glutinosa* subsp. *x luerksenii*, *Senna glutinosa* subsp. *glutinosa*, *Eremophila latrobei* subsp. *latrobei*, *Senna stricta* over low open shrubland of *Eremophila jucunda*, *Ptilotus obovatus*, *Eremophila phyllopoda* subsp. *phyllopoda* over very open hummock grassland of *Triodia epactia*.
- **Unit 8** - Scattered low trees of *Acacia xiphophylla* and *Acacia fuscaneura* over tall open shrubland of *Acacia xiphophylla* over open shrubland of *Senna stricta*, *Acacia tetragonophylla*, *Eremophila phyllopoda*, *Scaevola spinescens*, *Senna glutinosa* subsp. *glutinosa*, *Senna glutinosa* subsp. *x luerksenii* over low open shrubland of *Eremophila cuneifolia*, *Tribulus suberosus*, *Enchylaena tomentosa* var. *tomentosa* and *Ptilotus obovatus* over very open hummock grassland of *Triodia epactia*.

Vegetation of Drainage Lines:

- **Unit 7** - Tall shrubland of *Acacia citrinoviridis* and *Acacia tetragonophylla* over open shrubland of *Ptilotus obovatus* and *Senna artemisioides* subsp. *helmsii* over scattered tussock grasses of *Cenchrus ciliaris*.
- **Unit 9** - Woodland to open woodland of *Eucalyptus victrix* (with pockets of *Eucalyptus camaldulensis*) over tall shrubland to tall open shrubland of *Acacia citrinoviridis* and *Melaleuca linophylla* over mixed low open shrubland over tussock grassland of *Cenchrus ciliaris* and *Cenchrus setiger*.

	<ul style="list-style-type: none"> Unit 10 - Scattered low trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over tall open shrubland of <i>Acacia citrinoviridis</i> over open shrubland of <i>Senna glutinosa</i> subsp. <i>glutinosa</i>, <i>Acacia pyrifolia</i>, <i>Hibiscus</i> sp. Canga (P.J.H. Hurter & J. Naaykens 11013), <i>Dodonaea pachyneura</i> over low open shrubland of <i>Ptilotus obovatus</i> over open hummock grassland of <i>Triodia epactia</i> over very open tussock grassland of <i>Cymbopogon ambiguus</i> and <i>Eriachne mucronata</i>.
Clearing Description	Stoney Creek Project Channar Mining Pty Ltd proposes to clear 10 hectares within an application area of 70 hectares for the purposes of mineral exploration, hydrogeological and geotechnical investigations and associated activities. The project is located 11 kilometres south-east of Paraburdoo in the Shire of Ashburton.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994);
	to
Comment	Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994). The majority of remnant vegetation located within the application area was described as excellent in condition. A small portion (0.8 hectares) of the application area was described as completely degraded and this area was associated with tracks and previously cleared areas (Rio Tinto, 2015). Where possible, low impact clearing methods such as dozer blade up clearing will be used. Blade down clearing may be required in areas of steep or tough terrain to provide a safe working environment (Rio Tinto, 2015).

3. Assessment of application against clearing principles

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

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The application area is located within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (Rio Tinto, 2015; GIS Database). The Hamersley sub-region is located in the southern section of the Pilbara craton. This area comprises mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite). Mulga low woodland occur over bunch grasses on fine textured soils in valley floors, and <i>Eucalyptus leucophloia</i> over <i>Triodia brizoides</i> on skeletal soils of the ranges (CALM, 2002). The vegetation of the Pilbara bioregion is well represented in Western Australia and is considered to be of least concern with regards to conservation status (Department of Natural Resources and Environment, 2002; Government of Western Australia, 2014).</p> <p>A flora survey was undertaken by Eco Logical Australia in 2015 which identified seven vegetation associations within the application area. A total of 263 species from 111 genera and 46 families were recorded during the broader flora survey undertaken of Dogger's Gorge (survey area approximately 272 hectares) (Rio Tinto, 2016). However, within the smaller Stoney Creek application area (70 hectares) a reduced number of taxa would be present. No species of Threatened flora were recorded during the flora survey (Rio Tinto, 2015). Four Priority flora species were recorded during the survey including <i>Hibiscus</i> sp. Canga (P1), <i>Eremophila coacta</i> (P3), <i>Grevillea saxicola</i> (P3) and <i>Ptilotus trichocephalus</i> (P4) (Rio Tinto, 2015). Large numbers of Priority flora species were recorded either within or in the surrounding local area. The Priority flora species <i>Hibiscus</i> sp. Canga recorded 225 individuals (from 15 locations within the application area) and <i>Grevillea saxicola</i> recorded approximately 50-100 individuals (from 19 locations within the application area) (Rio Tinto, 2015). Rio Tinto (2015) recorded 16 individuals of <i>E. coacta</i> at two locations within the application area and approximately 20 individuals of <i>P. trichocephalus</i> at one location in the application area. The total population size of these two Priority flora species is large with 3,252 individuals (from 384 records) and 4,422 individuals (from 382 records) for <i>E. coacta</i> and <i>P. trichocephalus</i> reported by Rio Tinto (2015). The proposal is not considered to have a significant impact on either of these species or habitat that is critical to their continued existence.</p> <p>One unknown flora species of interest was recorded during the survey and is temporarily known as <i>Abutilon</i> sp. (Dog-J135). Rio Tinto (2015) confirmed an Environmental Restriction Zone will be placed around the two areas where this species was recorded in the application area, until the species is identified by the WA Herbarium. Potential impacts to this species may be avoided by the implementation of a flora condition.</p> <p>There are no Threatened Ecological Communities (TEC's) or Priority Ecological Communities (PEC's) occurring within or near the application area (GIS Database). The flora survey also did not identify TEC's or PEC's within the survey area (Rio Tinto, 2015).</p> <p>A search of available biological databases was undertaken (using a 20 kilometre search area) and reported a total of 241 fauna species comprising two amphibian, 86 bird, 6 fish, 69 invertebrate, 21 mammal and 57 reptile species from 801 records within the area (GIS Database). A desktop survey of fauna species potentially occurring in the region was also undertaken prior to the on-site fauna survey (Rio Tinto, 2015). The desktop survey identified 17 fauna species of conservation significance potentially occurring in the broader Doggers Gorge fauna survey area, indicating the area is low in fauna species diversity. Five of the fauna species had the potential to occur in the area and two were considered likely to occur in the application area. No Threatened fauna were recorded in the application area as part of the fauna survey (Rio Tinto, 2015).</p> <p>The majority of the application area consists of rocky hills and slopes (43 hectares or 62% of the application area) (Rio Tinto, 2015). The rocky hills and slopes comprise hill tops, upper and lower slopes; occasionally steep scree slopes; rocky ironstone outcrops with skeletal soils (Rio Tinto, 2015). This habitat type does not support a diversity of fauna species. For this reason the application area does not support a high level of faunal diversity or contain significant fauna habitat for indigenous fauna (GIS Database).</p>
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The biological surveys confirm the application area does not contain a high level of biological diversity. The proposed clearing is small (10 hectares), temporary, of low impact and the vegetation proposed to be cleared is well represented in the surrounding area. For these reasons it is unlikely the proposal will result in the clearing of native vegetation that has higher biodiversity values than the surrounding, undisturbed vegetation.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology CALM (2002)
Department of Natural Resources and Environment (2002)
Government of Western Australia (2014)
Rio Tinto (2015)
Rio Tinto (2016)

GIS Database:
- Threatened Fauna
- Threatened and Priority Flora
- TEC/PEC – Buffer
- TEC/PEC – Boundaries

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

Comments **Proposal is not likely to be at variance to this Principle**

A Level 1 fauna survey was conducted over the application area. Based on the results of this survey the following four broad habitat types have been identified in the application area (Rio Tinto, 2015):

1. Rocky hills and slopes;
2. Undulating plains;
3. Minor gullies and creeks; and
4. Moderate drainage.

The most widespread fauna habitat type was rocky hills and slopes (62% of the application area) and the least widespread fauna habitat was minor gullies and creeks (2% of the application area). No Threatened fauna were recorded in the application area as part of the fauna survey (Rio Tinto, 2015).

A search of available biological databases was undertaken and no Threatened fauna were located in the application area (GIS Database). A desktop survey of fauna species potentially occurring in the region was undertaken prior to the fauna survey (Rio Tinto, 2015). The desktop survey identified 17 fauna species of conservation significance potentially occurring within the application area. Ten of the 17 conservation listed species identified were deemed unlikely to occur in the application area as the area did not support suitable fauna habitat for the species. Five of the fauna species had the potential to occur in the area and two were considered likely to occur in the application area.

Threatened fauna species that were identified in the desktop survey as potentially occurring in the application area include; Northern Quoll (*Dasyurus hallucatus* – Endangered), Pilbara Olive Python (*Liasis olivaceus* subsp. *barroni* – Vulnerable), Ghost Bat (*Macroderma gigas* – Vulnerable); Fork-tailed Swift (*Apus pacificus* – Migratory) and the Long-tailed Dunnart (*Sminthopsis longicaudata* – Priority 4). The fauna survey report confirms these species have either a large home range, utilise a range of habitat types or suitable habitat is located outside the application area. None of the habitat types are considered to be core habitats for any of the fauna species and none of the species would rely on the area (Rio Tinto, 2015). Therefore, it is unlikely that the habitat is significant for these fauna species.

The fauna survey report confirms the Pilbara Leaf-nosed Bat (*Rhoinicteris aurantia* - Vulnerable) is likely to utilise some of the available habitats for foraging and dispersal. Vegetation Unit 9 (drainage line) is likely to be used for foraging by the Pilbara Leaf-nosed Bat and this habitat type consists of a small portion (16.2%) of the application area (Rio Tinto, 2015). Recent, targeted fauna analysis of the Pilbara Leaf-nosed Bat habitat undertaken by Rio Tinto, reported local roost sites for the species occur west of the application area. No suitable roost sites were located in the broader Doggers Gorge fauna survey area (Rio Tinto, 2015). The small amount of clearing required (10 hectares), temporary and low impacts associated with the proposal are not likely to impact Pilbara Leaf-nosed Bat habitat.

The fauna survey identified the Rainbow Bee-Eater (*Merops ornatus* – Migratory) is likely to occur in the application area. However, no permanent or semi-permanent water holes were recorded during the fauna survey (Rio Tinto, 2015). It is unlikely Rainbow Bee-eater individuals would rely on the application area as this species require suitable habitat for foraging (shrublands and woodland) and often require close proximity to a permanent water source (DotE, 2016). Rainbow Bee-Eaters are highly mobile and widely distributed around Australia, therefore the application area is not considered to be significant habitat for the species (DotE, 2016).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology DotE (2016)
Rio Tinto (2015)

GIS Database:
- Threatened Fauna

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

Comments **Proposal is not likely to be at variance to this Principle**
A search of available databases was undertaken and no Threatened flora were located in the application area (GIS Database). A flora survey was also undertaken by Eco Logical Australia in 2015 which identified seven native vegetation associations within the application area (Rio Tinto, 2015). Rio Tinto (2015) report no species of Threatened flora were recorded in the application area. The native vegetation proposed to be cleared is not likely to contain or is not necessary for the continued existence of rare flora.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Rio Tinto (2015)

GIS Database:
- Threatened and Priority 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.

Comments **Proposal is not likely to be at variance to this Principle**
According to available databases, there are no Threatened Ecological Communities (TEC's) occurring within or near the application area (GIS Database). Rio Tinto (2015) reported no vegetation communities considered to be a TEC within or near the application area as a result of the flora survey (Rio Tinto, 2015).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Rio Tinto (2015)

GIS Database:
- TEC/PEC - Buffers
- TEC/PEC - Boundaries

(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.

Comments **Proposal is not at variance to this Principle**
The application area falls within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.58% of the pre-European extent of vegetation remains in Western Australia (refer to table) (Government of Western Australia, 2014; GIS Database) As large areas of the pre-European extent of native vegetation remain within the Pilbara IBRA region, the vegetation is considered to be of least concern with regards to conservation status (Department of Natural Resources and Environment, 2002).

The native vegetation located in the application area has been mapped as Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database). This vegetation association has not been extensively cleared as over 99% of the vegetation association remains at the State level and bioregional levels (refer to table) (Government of Western Australia, 2014).

The clearing of vegetation as part of the proposal is not part of a significant ecological linkage. The area proposed to be cleared is also not considered to be significant as a remnant in an area that has been extensively cleared (GIS Database). The majority of the vegetation is also considered to be in excellent to good condition and for these reasons the clearing of native vegetation is not at variance to this Principle (Rio Tinto, 2015).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in All DPaW Managed Land
IBRA Bioregion – Pilbara	17,808,657.06	17,733,583.95	99.58	Least Concern	8.40
Beard veg assoc. – State					
82	2,565,901.27	2,553,217.03	99.51	Least Concern	10.52
Beard veg assoc. – Bioregion					
82	2,563,583.23	2,550,898.98	99.51	Least Concern	10.53

* Government of Western Australia (2014).

** Department of Natural Resources and Environment (2002).

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Department of Natural Resources and Environment (2002)
Government of Western Australia (2014)

GIS Database:

- IBRA WA (Regions - Sub Regions)
- Pre-European Vegetation

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

Comments Proposal is at variance to this Principle

There are two, ephemeral watercourses located within the southern and western part of the application area (GIS Database). These watercourses are known as Stoney and Geode Creeks (Rio Tinto, 2015). Both watercourses drain into Turee Creek, a major ephemeral drainage line located approximately 4.5 km south of the application area (GIS Database). Turee Creek is likely to flow after large rainfall events in the region.

The application area supports riparian vegetation that is growing in, or in association with the two ephemeral watercourses including the flora species; *Acacia citrinoviridis*, *Eucalyptus victrix*, *Eucalyptus camaldulensis*, *Melaleuca linophylla*, *Acacia pyrifolia*, *Triodia epactia*, *Cymbopogon ambiguus*, and *Eriachne mucronata* (DPaW, 2016; Rio Tinto, 2015). These species all occur in rocky creeks, creek lines, river (or creek) beds, floodplains, flats, billabongs or along watercourses (DPaW, 2016). These riparian flora species form part of vegetation associations 7, 9 and 10 which are growing in association with drainage lines in the application area (Rio Tinto, 2015). The introduced (weed) species *Cenchrus setiger* is also known to occur in floodplains and is located in vegetation association 9 within the application area (DPaW, 2016). The potential impacts to riparian vegetation may be minimised through the implementation of a vegetation management condition.

In addition, Rio Tinto (2015) reported the Priority 1 flora species *Hibiscus* sp. Canga has been recorded in rocky creeklines and occurs in vegetation association 6 of the application area. *Eremophila coacta* (P3), *Grevillea saxicola* (P3) and *Ptilotus trichophalus* (P4) are also reported by Rio Tinto (2015) as growing within the application area. These Priority flora species are associated with creeklines, drainage systems or floodplains (Rio Tinto, 2015).

The application area contains riparian vegetation which will be cleared as part of the proposal. The majority of riparian flora species are located in vegetation association 9. The condition of vegetation in vegetation association 9 is described as variable, (ranging from Poor to Very Good) due to the presence of a large number of introduced species. Rio Tinto (2015) report disturbance to riparian vegetation should be minimised or avoided where possible as part of clearing activities. Given the relatively low impacts associated with mineral exploration, hydrogeological and geotechnical investigations and the small disturbance footprint (10 hectares), clearing activities are unlikely to significantly impact riparian vegetation. The vegetation associations within the drainage lines are also considered to be a small part (25.8 hectares) of the larger application area (70 hectares) (Rio Tinto, 2015). Native vegetation clearing will not have a detrimental impact on vegetation associations located in the area.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology DPaW (2016)
Rio Tinto (2015)

GIS Database:

- Hydrography, linear

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

Comments Proposal is not likely to be variance to this Principle

The majority of the application area is mapped as occurring on the Newman land system (61.8 hectares) while a small portion of the southern application area is mapped as occurring on the Platform land system (8 hectares) (Rio Tinto, 2015; GIS Database). The Newman land system consists of rugged high mountains, ridges and plateaux with near vertical escarpments of jaspilite, chert and shale and supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The Platform land system consists of narrow, raised plains and highly dissected slopes on partly consolidated colluvium below the footslopes of hill systems such as the Newman land system and supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The Newman and Platform land systems are very well vegetated, dominated by spinifex and not susceptible to degradation or soil erosion (Rio Tinto, 2015; Van Vreeswyk et al., 2004).

Northcote, et al. (1960-68) describe soils in the application area as shallow, stony earthy loams, without soil cover in steep hills and steeply dissected pediments or ranges on areas of banded jaspilite and chert along

with shales, dolomite, and iron ore formations (GIS Database). This soil type does not readily erode and is not susceptible to wind erosion. It is also unlikely that the small amount of clearing required for the proposal (10 hectares) within a 70 hectare boundary area and method of clearing (retention of vegetation using raised blade) will cause land degradation.

As the proposal requires a relatively small amount of native vegetation clearing, it is unlikely the proposal will change salinity levels or impact nutrient export. It is also unlikely the small amount of clearing proposed will affect the present or future use of land at this location.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Northcote, et al. (1960-68)
Rio Tinto (2015)
Van Vreeswyk et al., (2004)

GIS Database:
- Hydrography, linear
- Rangeland Land System Mapping

(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.

Comments Proposal is not at variance to this Principle

The application area does not lie within any conservation areas or Department of Parks and Wildlife managed lands (Rio Tinto, 2015; GIS Database). The nearest conservation area is Karijini National Park which is located approximately 27 kilometres north-east of the application area (GIS Database). As this conservation area is located a considerable distance from the application area, the proposed clearing is not likely to have any impacts on the environmental values of adjacent or nearby conservation areas.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Rio Tinto (2015)

GIS Database:
- DPaW Tenure

(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.

Comments Proposal is not likely to be at variance to this Principle

No Public Drinking Water Source Areas (PDWSA's) are located within or in the vicinity of the application area (GIS Database). There are no permanent watercourses or wetlands located within the application area (Rio Tinto, 2015; GIS Database). Two minor, ephemeral watercourses (Stoney Creek and Geode Creek) are located within the application area. Clearing activities undertaken for the proposal are not expected to adversely impact either of these creeks. Therefore, the clearing of native vegetation required for the proposal will not cause deterioration in the quality of surface water, including sedimentation, erosion, turbidity or eutrophication of water bodies on-site or off-site.

The groundwater within the application area is between 500 – 1000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). It is not expected that the proposed clearing of 10 hectares within a permit boundary of 70 hectares would adversely alter salinity levels within the application or surrounding area. Due to the small amount of clearing required within a large application area, no changes to pH are expected. Additionally, the proposed clearing is not likely to have an impact on the quality of groundwater either on-site or off-site of the application area.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Rio Tinto (2015)

GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas

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

Comments Proposal is not likely to be at variance to this Principle

Annual total rainfall for the nearest weather station located at Paraburdoo Aero recorded 441.8 millimetres in 2015 and total average annual evaporation for the area is 3,200 millimetres (BoM, 2016). For this reason, there is likely to be little surface flow during normal seasonal rains (BoM, 2016). Two minor, ephemeral watercourses (Stoney Creek and Geode Creek) are located within the application area and may be subject to seasonal

flooding. However, it is unlikely that the proposed clearing will cause or exacerbate the incidence or intensity of flooding.

The small amount of native vegetation clearing (10 hectares) within a large application area (70 hectares) for the purpose of exploration is unlikely to increase flooding of the application area. In addition, the low impact method of raised blade clearing will be used for the proposal (Rio Tinto, 2015). This method minimises impacts to the existing vegetation and promotes rapid regrowth. As this method of clearing does not expose large areas of soil and retains the roots of vegetation, it is highly unlikely that the clearing associated with the proposal will cause, or exacerbate the incidence or intensity of flooding. The application area is well vegetated further reducing the likelihood of or intensity of flooding (GIS Database).

The soils of the application area are described as stony earthy loams, without soil cover in steep hills and steeply dissected pediments or ranges on areas of banded jaspilite and chert along with shales, dolomite, and iron ore formations (GIS Database; Northcote, et al. 1960-68). This soil type does not readily erode, is not susceptible to wind erosion or surface water run-off. It is likely that surface water run-off may occur over short distances following heavy and intense falls of rain. The application area receives low annual rainfall. The total annual rainfall for 2015 was 441.8 millimetres at Paraburdoo Aero weather station (BoM, 2016).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BoM (2016)
Northcote, et al. (1960-68)

Rio Tinto (2015)
GIS Database:
- Hydrography, linear

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments There is one native title claim (WC2010/016) over the application area (DAA, 2016). This claim has been registered with the National Native Title Tribunal on behalf of the claimant groups (DAA, 2016). However, the 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 no registered Aboriginal sites of significance within the application area (DAA, 2016). 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 Environment Regulation, Department of Parks and Wildlife and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 18 January 2016 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology DAA (2016)

4. References

- BoM (2016) Bureau of Meteorology Website - Climate Data Online, Paraburdoo Aero. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/index.shtml>. (Accessed 2 February 2016).
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- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 – Hamersley subregion) Department of Conservation and Land Management, Perth, Western Australia.
- DAA (2016) Aboriginal Heritage Inquiry System. Department of Aboriginal Affairs. <http://maps.dia.wa.gov.au/AHIS2> (Accessed 5 February 2016).
- DotE (2016) *Merops ornatus* in Species Profile and Threats Database. Department of the Environment. <http://www.environment.gov.au/sprat>. Department of the Environment. (Accessed 5 February 2016).
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Western Australian Department of Parks and Wildlife, Perth, Western Australia.
- Keighery B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of Western Australia (Inc.). Nedlands, Western Australia.
- Northcote, K. H. with Beckmann G. G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- Rio Tinto (2015) Desktop Flora, Vegetation and Fauna Habitat Assessment for an Area Within AM70/00265 at Stoney Creek,

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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2015) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia}:-

T	<p>Threatened species: Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).</p> <p>Threatened fauna is that subset of ‘Specially Protected Fauna’ declared to be ‘likely to become extinct’ pursuant to section 14(4) of the Wildlife Conservation Act.</p> <p>Threatened flora is flora that has been declared to be ‘likely to become extinct or is rare, or otherwise in need of special protection’, pursuant to section 23F(2) of the Wildlife Conservation Act.</p> <p>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.</p>
CR	<p>Critically endangered species Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
EN	<p>Endangered species Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
VU	<p>Vulnerable species Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>

- EX Presumed extinct species**
Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
- IA Migratory birds protected under an international agreement**
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 the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- CD Conservation dependent fauna**
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- OS Other specially protected fauna**
Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- P Priority species**
Species which are poorly known; or
Species that are adequately known, are rare but not threatened, and 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.