



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3939/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: **Hamersley Iron Pty Ltd**

1.3. Property details

Property: *Iron Ore (Rhodes Ridge) Agreement Authorisation Act 1972, Temporary Reserve 70/4193*
Local Government Area: Shire of East Pilbara
Colloquial name: Evaluation Drilling at Ophthalmia North

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
2.3		Mechanical Removal	Mineral Exploration

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 9 December 2010

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
<p>Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia and are useful to look at vegetation in a regional context.</p> <p>The following Beard Vegetation Associations have been mapped within the application area (GIS Database):</p> <p>82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>; and</p> <p>18: Low woodland; Mulga (<i>Acacia aneura</i>).</p> <p>A flora and vegetation survey of the application area was conducted on the 23rd May 2010 by Rio Tinto Iron Ore (Rio Tinto Iron Ore, 2010). Eleven vegetation communities were identified and grouped into the following categories:</p> <p>1. Vegetation from Slight Slopes</p> <p>SS1: <i>Eucalyptus leucophloia</i>, <i>Corymbia deserticola</i> low woodland over <i>Acacia tenuissima</i>, <i>Acacia bivenosa</i> open shrubland over <i>Keraudrenia velutina</i> low open shrubland over <i>Triodia basedowii</i>, <i>Triodia pungens</i> hummock grassland.</p> <p>SS2: <i>Eucalyptus leucophloia</i>, <i>Eucalyptus gamophylla</i>, <i>Corymbia deserticola</i> low woodland over <i>Acacia sibirica</i> high open shrubland over <i>Acacia adsurgens</i> open shrubland over <i>Tribulus suberosus</i>, <i>Ptilotus rotundifolius</i>, <i>Keraudrenia velutina</i> low open shrubland over <i>Triodia basedowii</i>, <i>Triodia pungens</i> hummock grassland.</p> <p>2. Vegetation from the Flats</p> <p>F1: <i>Acacia pachyacra</i>, <i>Acacia pruinocarpa</i> high shrubland over <i>Ptilotus obovatus</i>, <i>Keraudrenia velutina</i> shrubland over <i>Triodia melvillei</i> very open hummock grassland over <i>Paraneurachne muelleri</i>, <i>Aristida latifolia</i> very open tussock</p>	<p>Hamersley Iron Pty Ltd has applied to clear up to 2.3 hectares of native vegetation within an application area of approximately 28.6 hectares. The application area is located approximately 47 kilometres north west of the township of Newman within the Pilbara region of Western Australia (GIS Database).</p> <p>The clearing is required for an exploration drilling program. This will include clearing for drill lines, drill pads, and access tracks.</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p> <p>To</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>	<p>The vegetation condition is based on the flora and vegetation survey carried out by Rio Tinto Iron Ore (2010). This was assessed utilising the vegetation condition scale used for the Pilbara and was converted to the Keighery scale for consistency.</p>

grassland.

F2: *Acacia aneura* high open shrubland over *Solanum lasiophyllum*, *Eremophila caespitosa* low open shrubland over *Aristida contorta* very open bunch grass.

F3: *Corymbia candida* subsp. *dipsodes*, *Acacia aneura* low woodland over *Acacia pachyacra* high open shrubland over *Senna pleurocarpa*, *Keraudrenia velutina* low open shrubland over *Chrysopogon fallax*, *Themeda triandra* tussock grassland.

F4: *Acacia aneura*, *Acacia pruinocarpa* low woodland over *Acacia sibirica*, *Acacia rhodophloia* open shrubland over *Eremophila forrestii* low shrubland over *Triodia wiseana*, *Triodia basedowii* open hummock grassland.

3. Vegetation from Mulga Flats

MF1: *Acacia aneura*, *Acacia catenulata*, *Corymbia deserticola* low open forest over *Rulingia luteiflora* high open shrubland over *Eremophila forrestii*, *Senna glaucifolia* open shrubland over *Triodia wiseana*, *Triodia basedowii*, *Triodia pungens* hummock grassland.

MF2: *Acacia aneura*, *Acacia pruinocarpa*, *Corymbia deserticola* low open forest over *Acacia pachyacra*, *Rhagodia* sp. Hamersley open shrubland over *Eremophila forrestii* low scattered shrubs over *Triodia pungens* very open hummock grassland over *Bidens bipinnata* (Bippinate beggartick) scattered herbs.

MF3: *Acacia aneura*, *Corymbia deserticola* low open forest over *Eremophila fraseri* open shrubland over *Triodia melvillei* hummock grassland.

4. Flowline Vegetation

FL1: *Corymbia hamersleyana*, *Acacia aneura* low woodland over *Rulingia luteiflora*, *Gossypium robinsonii* open scrub over *Triodia pungens*, *Triodia melvillei* very open hummock grassland over *Themeda triandra*, *Aristida latifolia* open tussock grassland.

FL2: *Corymbia hamersleyana*, *Acacia aneura* low woodland over *Acacia pyrifolia*, *Eremophila longifolia* open heath over *Tephrosia rosea* low open shrubland over *Triodia pungens* very open hummock grassland over *Themeda triandra*, *Eriachne tenuiculmis* tussock grassland.

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The application area falls within the Hamersley sub-region of the IBRA Pilbara Bioregion. The vegetation within this sub-region is characterised as Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (CALM 2002). Shepherd (2007) reported that approximately 100% of the pre-European vegetation still exists in the Hamersley sub-region.

The vegetation of the application area is broadly mapped as Beard Vegetation Associations; 18: Low woodland; Mulga (*Acacia aneura*) and 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; (GIS Database). The application area lies approximately 85 kilometres south of the Fortescue Marsh, an important arid zone wetland system in the Pilbara, and approximately 70 kilometres east of Karijini National Park (GIS Database).

The application area falls within an area identified by Department of Environment and Conservation (DEC) as potentially having conservation significance for Mulga (Rio Tinto Iron Ore, 2010). Mulga communities are repositories of significant productivity and biodiversity, they are resource hotspots because of their ability to capture, retain and cycle precious sediments, nutrients and water. Therefore, the effective management of

Mulga is critically important for sustainable land use planning and natural resource management, particularly in areas where land use interests (such as pastoral and mining) may compete with biodiversity interests (DEC, 2009).

A flora and vegetation survey of the Hamersley Iron Pty Ltd application area was undertaken by Rio Tinto Iron Ore (2010). This involved both a desktop study and a site survey. The desktop study of the application area interrogated both the DEC and Rio Tinto Iron Ore databases. This showed that no Declared Rare Flora (DRF), Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) are likely to occur within the application area (Rio Tinto Iron Ore, 2010).

The closest TEC to the application area is the Ethel Gorge aquifer stygofauna community, which lies approximately 57 kilometres to the south-east of the application area. The closest PEC which comprises Weeli Weeli Spring Community occurs approximately 28 kilometres north of the application area (GIS Database). No PECs or TECs are likely to be directly or indirectly impacted by the proposed clearing and none were recorded during the survey. The desktop study also revealed that twenty Priority flora species, were recorded within 40 kilometres of the application area (Rio Tinto Iron Ore, 2010).

The application area provides suitable habitat for the Priority species *Goodenia nuda*, *Goodenia* sp. East Pilbara, *Isotropis parviflora*, *Rhagodia* sp. Hamersley (M. Trudgen 17794), *Brachyscome* sp. Wanna Munna Flats, *Brunonia* sp. Long hairs, *Aristida lazaridis*, *Aristida jerichoensis* var. *subspinulifera* and *Themeda* sp. Hamersley Station (ME Trudgen 11431). Of these species, only one Priority 3 species, *Rhagodia* sp. Hamersley (M. Trudgen 17794) was recorded during the survey. It is considered that some of the Priority species may have been overlooked due to their short-lived, annual growth, or their un-identifiable state due to the dry conditions at the time of the survey (Rio Tinto Iron Ore, 2010).

The survey of the application area recorded a total of 136 vascular plant taxa from 27 families and 63 genera. In addition, two introduced flora species *Cenchrus ciliaris* (Buffel Grass) and *Bidens bipinnata* (Bipinnate Beggartick) were recorded throughout the application area (Rio Tinto Iron Ore, 2010). Neither of these weeds are listed as Declared Plants for the Pilbara under the *Agriculture and Related Resources Protection Act 1976*; however both species are considered to be serious environmental weeds. The presence of weeds has the potential to reduce the biodiversity of an area, and care should be taken to ensure that weeds are not spread as a result of the proposed clearing. Potential impacts may be minimised by the implementation of a weed management condition.

Eleven intact vegetation communities were recorded within the survey area, all of which are well-represented in this section of the Hamersley sub-region (Rio Tinto Iron Ore, 2010). The vegetation condition was considered to be Very Good to Excellent (Rio Tinto Iron Ore, 2010). No Declared Rare Flora (DRF) or *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened flora were observed within the application area, however one Priority 3 species; *Rhagodia* sp. Hamersley (M. Trudgen 17794) was recorded in twelve locations. It is considered that this species is not uncommon in Snakewood (*Acacia xiphophylla*) and Mulga vegetation in the Hamersley sub-region and its priority status is likely to be a result of poor historic collections rather than inherent rarity or susceptibility to threatening processes such as clearing (Rio Tinto Iron Ore, 2010).

The survey recorded one Western Pebble-Mound Mouse mound within the application area. Rio Tinto Iron Ore (2010) have stated that this mound will be avoided to mitigate any impact on this species.

The vegetation communities recorded within the application area are well represented within the broader region (Shepherd, 2007).

The total number of flora species recorded from the Hamersley Iron Pty Ltd application area was deemed to be within the expected range for an area of this size in the locality (Rio Tinto Iron Ore, 2010). Additionally the dominant families and genera, and assortment of species present, are typical of the local area and are also representative of the greater Pilbara region. Thus, the application area is not likely to have greater diversity than similar areas within the region (Rio Tinto Iron Ore, 2010).

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

Methodology CALM (2002)
DEC (2009)
Rio Tinto Iron Ore (2010)
Shepherd (2007)
GIS Database:
- DEC tenure
- Declared Rare and Priority Flora List
- Ramsar Wetlands
- Threatened Ecological Sites buffered

(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 desktop survey using databases maintained by the Department of Environment and Conservation (DEC) was conducted by the assessor. This identified that 280 fauna species could potentially occur within a 40 kilometre radius of the application area (NatureMap, 2010). The DEC and WA Museum databases identified that thirteen conservation significant fauna species were recorded within a 40 kilometre radius of the application area (Rio Tinto Iron Ore, 2010).

The following three primary fauna habitats were identified within the application area:

1. Flats dominated by *Acacia* spp. & Eucalypts;
2. Lower foot slopes dominated by Eucalypts over Spinifex (*Triodia* spp.); and
3. Minor flowlines.

No significant fauna habitats such as caves, waterholes, significant creek lines, wetlands or gorges were observed in the survey area (Rio Tinto Iron Ore, 2010).

On the basis of habitat favourable to the conservation significant species, Rio Tinto Iron Ore (2010) considered that the following seven conservation significant fauna species could potentially occur within the application area:

The Northern Quoll (*Dasyurus hallucatus*) (Schedule 1) occurs in a range of habitats including open forest, monsoon rainforest, and savannah woodlands and is most abundant in rocky environments (Rio Tinto Iron Ore, 2010). The application area may provide foraging habitat for this species, however the proposed clearing of 2.3 hectares is unlikely to impact this species, which is known to maintain home ranges of 100 hectares (Rio Tinto Iron Ore, 2010).

The Western Pebble-Mound Mouse (*Pseudomys chapmani*) (Priority 4) is found on stony hillsides with hummock grasslands within the Hamersley and Chichester sub-regions of the Pilbara bioregion (Rio Tinto Iron Ore, 2010). One Pebble Mouse mound was observed within the application area (Rio Tinto Iron Ore, 2010). Avoidance of this mound and any others potentially in the area, will mitigate any residual impact on this species or its conservation status.

The Australian Bustard (*Ardeotis australis*) (Priority 4) prefers open or lightly wooded grassland including *Triodia* sand plains and is considered scarce to common depending on season and habitat (Rio Tinto Iron Ore, 2010). The Australian Bustard may potentially occur within the application area; however the loss of 2.3 hectares of fragmented vegetation is unlikely to affect the conservation status of this species.

The desktop study showed that three highly mobile bird species: Rainbow Bee-eater (*Merops ornatus*), Fork-tailed Swift (*Apus pacificus*), Oriental Plover (*Charadrius veredus*) may temporarily utilise the habitats within the application area. These habitats are widely represented within the greater Rhodes Ridge area, and are not considered core habitat for these fauna species (Rio Tinto Iron Ore, 2010). The proposed clearing is unlikely to affect the conservation status of these species.

The ecology of the Priority 1 species *Ramphotyphlops ganei* (a type of blind snake) is poorly known however individuals are likely to inhabit topsoil in moist gorges and gullies and may also frequent termitaria and ant nests. The proposed clearing will not significantly impact major gorges, gullies or termitaria and as a result, is unlikely to affect *R. ganei*.

While, some of the conservation significant fauna species listed (Rio Tinto Iron Ore, 2010) may utilise the available habitats in the application area, the relatively small scale low impact of the proposed drilling program and the lack of specialised habitat suggests that the proposal represents a low risk of significant impact to any conservation significant fauna. No field observations of any of the above species were made at the time of the survey.

The vegetation communities recorded within the application area are well represented within the broader region (GIS Database) and the Pilbara bioregion remains largely uncleared (Shepherd, 2007). Therefore it is not expected that any disturbance localised to the specific survey area will have a significant effect on fauna habitats on a broader scale.

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

Methodology NatureMap (2010)
Rio Tinto Iron Ore (2010)
Shepherd (2007)
GIS Database:
- Pre-European Vegetation

(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

There are no known records of Declared Rare Flora (DRF) within close proximity to the application area (GIS Database). Suitable habitat exists within the application area for *Lepidium catapycnon* (stony plains and hills), and the species has been recorded in the Rhodes Ridge locality (nearest known location is 9 kilometres north of the application area).

No DRF were recorded during the flora and vegetation survey of the application area (Rio Tinto Iron Ore, 2010). Given that *Lepidium catapycnon* has a perennial growth form and a distinctive zig zag stem it is unlikely that it was overlooked during the and vegetation survey.

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

Methodology Rio Tinto Iron Ore (2010)
GIS Database:
- Declared Rare and Priority Flora List

(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

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) have been recorded within the application area (GIS Database). The nearest TEC is the Ethel Gorge aquifer stygofauna community, which occurs approximately 57 kilometres to the south-east of the application area (GIS Database).

The flora and vegetation survey conducted by Rio Tinto Iron Ore (2010) also indicated that none of the vegetation communities recorded within the application area represented a TEC or PEC.

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

Methodology Rio Tinto Iron Ore (2010)
GIS Database:
-Threatened Ecological Sites Buffered

(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 Hamersley sub-region of the Pilbara Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). According to Shepherd (2007), approximately 99.95% of the Pre-European vegetation remains within the Pilbara bioregion (see table).

The vegetation of the application area has been broadly mapped as Beard vegetation associations:
18: Low woodland; Mulga; and
82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS database).

According to Shepherd (2007) approximately 100% of these Beard vegetation associations remain at both a state and bioregional level. Therefore the area proposed to be cleared does not represent a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,187	17,794,647	~99.95	Least Concern	6.32
Beard vegetation associations - State					
18	19,892,305	19,890,195	~99.9	Least Concern	2.1
82	2,565,901	2,565,901	~100	Least Concern	10.2
Beard vegetation associations - Bioregion					
18	676,557	676,557	~100	Least Concern	16.8
82	2,563,583	2,563,583	~100	Least Concern	10.2

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

Options to select from: Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment 2002)	
Presumed extinct	Probably no longer present in the bioregion
Endangered*	<10% of pre-European extent remains
Vulnerable*	10-30% of pre-European extent exists
Depleted*	>30% and up to 50% of pre-European extent exists
Least concern	>50% pre-European extent exists and subject to little or no degradation over a majority of this area
* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status	

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

Methodology Department of Natural Resources and Environment (2002)
Shepherd (2007)
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 may be at variance to this Principle

There are several minor ephemeral watercourses that pass through the application area (GIS Database). It is expected that these watercourses will only flow during significant rainfall.

Two riparian vegetation habitats were described during the flora and vegetation survey (Rio Tinto Iron Ore, 2010). The watercourses fall outside of the proposed drill lines except one which crosses through one minor ephemeral watercourse. The proposed clearing is unlikely to result in any significant impact to any watercourse provided the natural surface water flow patterns are not disturbed.

There are no swamps, major watercourses, local wetlands, Wetlands of Regional Significance or Wetlands of National Significance occurring within or in close proximity to the application area.

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

Methodology 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 at variance to this Principle

The application area falls within the Boolgeeda and Newman land systems (GIS Database). The Boolgeeda land system accounts for the majority of the application area (GIS Database).

The Boolgeeda land system is characterised by stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands and mulga shrublands. The Newman land system consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. Both land systems are generally not prone to degradation or erosion (Van Vreeswyk et al, 2004)

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

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- 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 likely to be at variance to this Principle

The application area is not located within any conservation areas or Department of Environment and Conservation managed lands (GIS Database).

The application area is approximately 85 kilometres south of the Fortescue Marsh, an important arid zone wetland system in the Pilbara, and approximately 70 kilometres east of Karijini National Park (GIS Database). At this distance, it is not likely that the vegetation within the application area would act as a buffer to these conservation areas, or is important as an ecological linkage to these conservation areas.

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

Methodology GIS Database:
- DEC 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

The application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The area is located in a *Rights In Water and Irrigation Act 1914* Groundwater Area and a permit to abstract groundwater in this area will be required. The groundwater salinity within the application area is between 500-1000 milligrams per litre (mg/L) of Total Dissolved Solids (TDS) (GIS Database) and is not expected to be altered as a result of the proposed clearing.

There are no permanent water bodies or watercourses within the application area. There are several minor, ephemeral drainage lines located within the application area (GIS Database). It is expected that these would only flow after or during significant seasonal rainfall events, or substantial localised falls.

Rainfall in the Pilbara tends to be unpredictable and erratic, and the rocky-sloping topography of much of the upper catchments often produces considerable runoff (Van Vreeswyk et al., 2004). As such, ephemeral watercourses tend to have high levels of sedimentation and turbidity after rainfall events (Van Vreeswyk et al., 2004). The relatively small amount of clearing associated with the application area is unlikely to increase the sediment load of surface water significantly compared to surrounding uncleared areas.

The clearing of 2.3 hectares of vegetation within the application area is not likely to have a significant impact on the quality of groundwater or surface water in the local area.

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

Methodology Van Vreeswyk et al. (2004)
GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas (PDWSA's)

(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

The application area is located within the upper Fortescue River Catchment Area which covers a total area of approximately 2, 975,192 hectares (GIS database). With an average annual rainfall of approximately 400 millimetres and an average annual evaporation rate of 3600 millimetres there is likely to be little surface flow during normal seasonal rains (GIS Database). Clearing will occur in a reasonably small area and there are only minor ephemeral drainage lines within the application area.

Local flooding occurs seasonally in the Pilbara region as a result of cyclonic activity and sporadic thunderstorm

activity. It is likely the ephemeral drainage lines within the application area would experience natural seasonal flooding during times of intense rainfall. However, the small area to be cleared (2.3 hectares) is not likely to lead to an increase in flood height or duration.

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

Methodology GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments-Catchments

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

Comments

There is one Native Title Claim (WC05/6) over the area under application (GIS Database). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. 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 (GIS Database). 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.

The clearing permit application was advertised on 13 September 2010 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the application.

It is the proponent's responsibility to liaise with the Department of Environment and Conservation 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.

Methodology GIS Database:
- Native Title Determined
- Native Title Federal
- Native Title NNTT
- Sites of Aboriginal Significance

4. References

- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Sub-regions in 2002 Pilbara Bioregion: Hamersley Sub-region (PIL3). Department of Conservation and Land Management, Perth.
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- 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.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
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- Rio Tinto Iron Ore (2010) Flora and Vegetation Survey of the Proposed Evaluation Drilling at Ophthalmia North. Native Vegetation Clearing Permit Supporting Report. August 2010.
- Shepherd, D.P. (2007) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Van Vreeswyk A.M.E., Payne A.L., Leighton K.A. and Hennig P. (2004) Technical Bulletin - An inventory and condition survey of rangelands in Pilbara Region, Western Australia, No 92, Department of Agriculture, Government of Western Australia, Perth, Western Australia.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
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
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
s.17	Section 17 of the <i>Environment Protection Act 1986</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [*Wildlife Conservation Act 1950*] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.

Schedule 4 **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.