



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3343/2
Permit type: Purpose Permit

1.2. Proponent details

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

1.3. Property details

Property: *Iron Ore (Hamersley Range) Agreement Act 1963*
Mineral Lease 4SA (AML70/4)
Local Government Area: Ashburton
Colloquial name: Nammuldi Lens EF Waste Dump

1.4. Application

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

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>Vegetation Description</p> <p>Beard Vegetation Associations have been mapped at a 1:250,000 scale for the whole of Western Australia. Two 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> (Kendrick, 2001).</p> <p>175: Short bunched grassland - savannah/grass plain (Pilbara) (Kendrick, 2001).</p> <p>Rio Tinto (2009) conducted a vegetation survey over the application area and surrounding vegetation between the 18 to the 21 March, 2009. Sixteen vegetation types have been identified within the application area (Rio Tinto, 2009). These are:</p> <p>Vegetation of the Stony Footslopes</p> <p>1) Mixed Acacia open shrubland over <i>Triodia wiseana</i> hummock grassland.</p> <p>2) <i>Corymbia deserticola</i> low open woodland, over mixed Acacia tall open shrubland / shrubland / low open shrubland, over <i>Triodia wiseana</i> open hummock grassland.</p> <p>Vegetation of the Gravelly Transition from Footslopes to Flat Plain</p> <p>3) Scattered mixed low trees and tall shrubs, over mixed Malvaceae and Acacia spp shrubland to low open shrubland over <i>Triodia epactia</i> hummock grassland.</p> <p>4) Mixed Acacia open shrubland, over <i>Triodia epactia</i> hummock grassland.</p> <p>Vegetation of the Internally Draining Clay Plain</p> <p><i>Triodia epactia</i> Hummock Grassland / Mixed Tussock Grassland</p>	<p>Hamersley Iron Pty Ltd is proposing to clear up to 88.06 hectares of native vegetation within a boundary of 88.16 hectares (Rio Tinto, 2009). The application area is located approximately 46 kilometres north-west of Tom Price (GIS Database). The proposed clearing is for the purpose of mineral production, which will involve the relocation of a waste dump due to the presence of high grade detrital deposits in the previously designed waste dump area (Rio Tinto, 2009).</p> <p>Clearing will be done using a dozer, blade down. Vegetation and topsoil will be stockpiled and used in rehabilitation (Rio Tinto, 2009).</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).</p> <p>To</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>	<p>The vegetation descriptions were derived from descriptions by Rio Tinto (2009).</p> <p>Clearing permit CPS 3343/1 was granted by the Department of Mines and Petroleum (DMP) on 24 December 2009 and authorised the clearing of up to 87.9 hectares of native vegetation within an area totalling approximately 88 hectares. Hamersley Iron Pty Ltd applied to DMP on 30 March 2010 to amend clearing permit CPS 3343/1 to increase the total area authorised to clear by 0.16 hectares and to increase the permit boundary to 88.16 hectares.</p> <p>The proposed increase to the size of the clearing area is due to a heritage site excluded from the original application now being subject to a Section 18 approval under the <i>Aboriginal Heritage Act 1972</i>. This area (totalling approximately 0.16 hectares) is now required for waste dump construction.</p>

5) *Corymbia deserticola*, *Hakea lorea*, open woodland, over mixed open shrubland, over *Triodia epactia* hummock grassland / mixed tussock grassland.

6) Scattered *Hakea lorea* low trees over *Chrysopogon fallax* / *Triodia epactia*, mixed tussock / hummock grassland.

7) *Eucalyptus xerothermica* low open woodland, over mixed Acacia and Malvaceae spp. open shrubland / low open shrubland over *Triodia epactia* and *Chrysopogon fallax* mixed tussock grassland.

Eremophila lanceolata Shrubland / Tussock Grassland

8) *Acacia aneura* low woodland, over *Eremophila lanceolata* and mixed Malvaceae spp. low shrubland, over mixed tussock grassland.

9) *Eremophila lanceolata*, *Sida platycalyx* and *Sida fibulifera* low shrubland, over mixed tussock grassland.

10) *Eremophila lanceolata*, *Sida platycalyx* and *Sida fibulifera* low shrubland over open mixed tussock grassland.

Chrysopogon fallax Tussock Grassland

11) *Eucalyptus xerothermica* and *Hakea lorea* scattered low trees, over mixed low open shrubland, over *Chrysopogon fallax* tussock grassland.

12) Scattered low trees, over mixed low open shrubland, over *Aristida inaequiglumis* and *Chrysopogon fallax* mixed tussock grassland.

Acacia aneura Woodland

13) *Acacia aneura* low open forest, over Malvaceae spp. mixed low shrubland, over *Panicum laevinode* and *Setaria dielsii* mixed tussock grassland.

14) *Acacia aneura* low woodland / tall open shrubland, over Malvaceae spp. mixed low shrubland, over mixed *Chrysopogon fallax* grassland

Vegetation of the Minor Creek Lines / Minor Drainage Lines

15) Mixed Acacia shrubland / open heath, over *Triodia epactia* open hummock grassland.

16) *Eucalyptus gamophylla* mallee over *Triodia epactia* open hummock grassland.

Disturbed Vegetation Types

1) Typically mixed tussock grasses and scattered mixed shrubs - Track in area still in use.

2) Typically mixed tussock grasses and scattered mixed shrubs - Track in area has been disused for quite some time, and as a result only minimal evidence remains.

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 is located within the Hamersley subregion of the Pilbara Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion is characterised by sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite), with 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 (Kendrick, 2001).

The vegetation within the application area consists of Beard Vegetation Associations 82 and 175, which are both common and widespread throughout the Pilbara region, with approximately 100% of these pre-European vegetation types remaining (GIS Database; Shepherd 2007).

Rio Tinto have identified and described 16 vegetation types for the application area and recorded a total of 176 flora species, from 86 genera belonging to 36 families (Rio Tinto, 2009). The total number of flora species recorded from the application area is within the expected range for an area of this size in the locality, and is not considered to represent high species richness (Rio Tinto, 2009). The condition of the vegetation was deemed to be Good to Excellent on the Keighery scale (1994) due to the lack of disturbance in the application area.

No Declared Rare Flora, Threatened Ecological Communities or Threatened Fauna Species were noted across the application area (GIS Database; Rio Tinto, 2009). One Priority flora species was identified within the application area: *Rhagodia* sp. Hamersley (P3). This species is generally found on rocky hillsides, coastal areas over limestone, along rivers and creeks, or on alluvial plains (Rio Tinto, 2009). This species is quickly becoming better known in the Pilbara, with the distribution and number of known locations and population sizes growing at a fast pace (Rio Tinto, 2009).

Five introduced flora species have been identified within the application area: *Cenchrus ciliaris* (Buffel Grass); *Bidens bipinnata* (Beggars Tick); *Malvastum americanum* (Spiked Malvastrum); *Cucumis melo* (Ulcardo Melon); and *Portulaca oleracea* (Purslane) (Rio Tinto, 2009). Care must be taken to ensure that the proposed clearing activities do not spread or introduce the above listed introduced species to non infested areas. Potential spread of introduced flora species may be minimised by the implementation of a weed condition.

From a fauna perspective, no detailed surveys have been undertaken to measure the species richness of the application area. It is acknowledged that the Pilbara bioregion is known to support a diversity of arid zone reptiles. However, based on assessment of fauna habitat it is not likely that the area applied to clear would support a higher level of fauna species diversity than any other area in the local area or region (GIS Database; Rio Tinto, 2009).

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

Methodology Keighery (1994)
Kendrick (2001)
Rio Tinto (2009)
Shepherd (2007)
GIS Database:
-Declared Rare and Priority Flora List
-Interim Biogeographic Regionalisation of Australia
-Interim Biogeographic Regionalisation of Australia (Subregions)
-Pre European Vegetation
-Threatened Fauna

(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

Three broad terrestrial fauna habitat types have been described within the application area (Rio Tinto, 2009). These are:

- *Acacia* shrubland with scattered *Corymbia deserticola* low trees over *Triodia wiseana* / *Triodia epactia* hummock grassland on stony undulating footslopes with a loamy substrate;
- *Eucalyptus xerothermica*, *Corymbia deserticola*, and *Hakea lorea* Low open woodland / over Mixed open shrubland / low open shrubland, over *Triodia epactia* hummock grassland / Mixed tussock grassland on internally draining clay pan plain;
- *Acacia aneura* low open forest / low woodland, over mixed Malvaceae low open shrubland, over mixed tussock grassland on internally draining clay pan plain.

The internally draining clay pan plain is a landscape unit that is not widespread in the Pilbara, but which contains habitats and vegetation types that are relatively widespread (Rio Tinto, 2009). A small portion of the application area is likely to be inundated following rain while generally moist conditions are likely to persist in other sections of the application area (Rio Tinto, 2009). This fact combined with the clay substrates, means the application area may provide some locally uncommon fauna habitats.

The assessing officer has conducted a search of the Western Australian Museum's online fauna database, centred on the coordinate 22°25'21"S, 117°26'21"E, with a radius of 25 kilometres. One Amphibian, 25 Avian, 17 Mammalian and 62 Reptile species have been identified as potentially occurring in the search area (Western Australian Museum, 2009). Rio Tinto (2009) also conducted a desktop search of the Department of Environment and Conservation's (DEC) Threatened Fauna Database over the application area with a 50 kilometre radius. Listed below are the Schedule and Priority fauna that could potentially utilise the application area:

Schedule 1 - Fauna that is rare or likely to become extinct, Wildlife Conservation (Specially Protected Fauna) Notice, 2010: *Dasyurus hallucatus* (Northern Quoll) - Endangered; *Rhinonicteris aurantius* (Orange Leaf-nosed Bat) - Vulnerable; *Liasis olivaceus barroni* (Pilbara Olive Python) - Vulnerable;

Schedule 4 - Other specially protected fauna, Wildlife Conservation (Specially Protected Fauna) Notice, 2010: *Falco peregrines* (Peregrine Falcon);

P3 - DEC Priority Fauna List: *Lagorchestes conspicillatus leichardti* (Spectacled Hare-wallaby);

P4 - DEC Priority Fauna List: *Sminthopsis longicaudatus* (Long-tailed Dunnart); *Macroderma gigas* (Ghost Bat); *Leggadina Lakedownensis* (Short-tailed Mouse); *Pseudomys chapmani* (Western Pebble-mound Mouse); *Ardeotis australis* (Australian Bustard); *Burhinus grallarius* (Bush Stone-curlew); *Amytornis striatus striatus* (Striated Grass Wren (Sandplain)); and *Notoscincus butleri* (lined soil-crevice skinks).

Of the above threatened fauna species, *Lagorchestes conspicillatus leichardti* (Spectacled Hare-wallaby) was the only fauna species that has a preferred habitat similar to that of the tussock/hummock grasslands of the flat internally draining plain of the application area (Rio Tinto, 2009). Despite the similarity of the habitat types, this species has never been recorded within the Brockman / Nammuldi area and is mainly known from Barrow Island (Rio Tinto, 2009).

Seven threatened migratory bird species, listed under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*, were identified as potentially utilising the application area (Rio Tinto, 2009). All of the migratory bird species are either coastal, migratory, wetland inhabitants or aerial feeders that are unlikely to have any general habitat specificity for the application area (Rio Tinto, 2009).

The primary habitats present within the application area are relatively common within the Hamersley (PIL3) subregion. While some Schedule or Priority fauna species may potentially utilise these habitats, neither the landforms nor vegetation types present, represent core habitat for any of these species of conservation significance (Rio Tinto, 2009). The close proximity of the application area to the Brockman / Nammuldi mine infrastructure means that the associated human and mechanical activity combined with previous vegetation disturbance within and surrounding the application area, greatly reduces the likelihood that any of these species would frequent the area (Rio Tinto, 2009).

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

Methodology Rio Tinto (2009)
Western Australian Museum (2009)
GIS Database:
Jeerinah 50cm Orthomosaic

(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

According to available datasets, there are no known records of Declared Rare Flora (DRF) or Priority Flora species within the application area (GIS Database).

A Declared Rare Flora and Priority Flora survey was undertaken by a botanist and an environmental scientist from Rio Tinto in March, 2009. No species of DRF or *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* listed threatened flora were recorded within the application area (Rio Tinto, 2009). Based on the known information, the proposed clearing is not likely to impact on any DRF species.

One Priority Flora species was recorded within the application area at one location: *Rhagodia* sp. Hamersley. This species is generally found on rocky hillsides, coastal areas over limestone, along rivers and creeks, or on alluvial plains (Rio Tinto, 2009). *Rhagodia* sp. Hamersley's known distribution and population size is continually increasing due to increases in knowledge as a result of the many surveys being conducted throughout the Pilbara (Rio Tinto, 2009). Consequently the disturbance of a few individuals is not considered to be of significance, nor would it be regarded as potentially impacting the conservation status of this species.

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

Methodology Rio Tinto (2009)
GIS Database:
-Declared Rare and Priority Flora List
-Threatened Plants

(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

There are no known Threatened Ecological Communities (TEC's) within the application area (GIS Database; Rio Tinto, 2009). The nearest known TEC is located approximately 15 kilometres to the north of the application area (Rio Tinto, 2009). Given the distance between the proposal and the nearest known TEC, the proposed clearing is not likely to impact on the conservation of that TEC.

It is suggested by Landsystem mapping for the Nammuldi Lens EF Waste Dump (NLEFWD) study area that the Priority Ecological Community (PEC) Coolabah-Lignum flats (*Eucalyptus victrix* over *Muehlenbeckia* community) could potentially occur within the internally draining plain that traverses the application area (Rio Tinto, 2009). A supplementary assessment by Rio Tinto (2009) of the aerial photography of the application area and its surrounding vegetation, and the aerial photography of known Coolabah-Lignum flats PEC's, suggests that this site does not support such a community. However, if such a community did exist it would most likely be small patches (approximately 20x20 metres) of more variable (mulga woodland with scattered coolabah type association) vegetation, with sufficient separation present between the application area and any areas where such vegetation could exist (Rio Tinto, 2009). Therefore it is unlikely that the development of the NLEFWD application area would directly impact on the potential PEC.

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

Methodology Rio Tinto (2009)
GIS Database:
-DEC Tenure

(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 is located within the Pilbara Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Shepherd (2007) report that approximately 99.95% of the pre-European vegetation still exists in the Pilbara Bioregion. The vegetation in the application area is broadly mapped as Beard Vegetation Associations 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and 175: Short bunch grassland - savannah/grass plain (Pilbara) (GIS Database; Kendrick, 2001). According to Shepherd (2007) there is approximately 100% of these vegetation types remaining in the Pilbara Bioregion and the State (see table below).

According to the Bioregional Conservation Status of Ecological Vegetation Classes the conservation status for the Pilbara Bioregion and Beard Vegetation Associations 82 and 175, is of 'Least Concern' (Department of Natural Resources and Environment, 2002).

Although several large scale mining operations are located within a 50 kilometre radius of the application area, the Pilbara Bioregion remains largely uncleared (GIS Database). As a result, the conservation of the vegetation associations within the bioregion is not likely to be impacted upon by the proposal.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion – Pilbara	17,804,188	17,794,647	~99.95	Least Concern	6.32
Beard veg assoc. – State					
82	2,565,901	2,565,901	~100	Least Concern	10.2
175	562,206	524,861	~99.7	Least Concern	4.2
Beard veg assoc. – Bioregion					
82	2,563,583	2,563,583	~100	Least Concern	10.2
175	507,036	507,006	~100	Least Concern	4.4

* Shepherd (2007)

** Department of Natural Resources and Environment (2002)

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

Methodology Shepherd (2007)
GIS Database:
-Interim Biogeographic Regionalisation of Australia

(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

According to available GIS Databases there are no permanent wetlands or watercourses within the application area (GIS Database). The Department of Water has advised that the vegetation to be cleared does not appear as a water way in the hydrography dataset, or as a significant wetland under the directory of important wetlands dataset (DoW, 2009).

Several ephemeral drainage lines traverse the application area as well as an internally draining basin which is periodically supplied with enough runoff, that the resultant drainage pools up in certain places and the vegetation communities within thrive as a result of the excess moisture (GIS Database; Rio Tinto, 2009). Rio Tinto (2009) has advised that the area would be better described as a type of floodplain, as it does not appear to hold significant amounts of water for extended periods of time at any significant frequency, such that it might warrant the description of wetland.

As there are watercourses within the application area, the proposed clearing is at variance to this Principle. However, the vegetation communities growing in association with the watercourses are not unique and are considered common and widespread in the Pilbara bioregion (GIS Database; Rio Tinto, 2009; Shepherd, 2007). Large representations of similar vegetation types occur in areas such as the Hamersley Station floodplain, and also further abroad, with the application area's floodplain being considered insignificant in a wider more regional context (Rio Tinto, 2009).

Methodology DoW (2009)
Rio Tinto (2009)
Shepherd (2007)
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 may be at variance to this Principle

According to the Department of Agriculture's Technical Bulletin No. 92 'An inventory and condition survey of the rangelands of the Pilbara region, Western Australia', the application area is comprised of the Wannamunna Land System, Newman Land System and the Boolgeeda Land System (GIS Database; Van Vreeswyk et al., 2004).

The Boolgeeda Land System consists of stony lower slopes and plains below hill systems supporting hard and soft Spinifex grasslands and mulga shrublands (Van Vreeswyk et al., 2004). It has been advised by the Department of Agriculture and Food (DAFWA, 2009) that approximately 30% of the application area is made up of the Boolgeeda Land System's "stony lower plains" land unit. Vegetation of the Boolgeeda Land System is generally not prone to degradation and the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Newman Land System consists of rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands which typify much of the Pilbara (Van Vreeswyk et al., 2004). An analysis of aerial photography for the application area reveals it is most likely to occur on the landform unit "lower slopes" which is not considered part of the erosional surfaces of the Newman Land System (GIS Database; Van Vreeswyk et al., 2004).

The Wannamunna Land System consists of hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (and occasionally eucalypt woodlands) (Van Vreeswyk et al., 2004). The largest portion of the proposed clearing is inferred to be the Wannamunna Land System's "hardpan plains" land unit with a small section of the "internal drainage plains" land unit along the north-east boundary of the application area (DAFWA, 2009). Generally the system has low susceptibility to erosion, however disturbances to surface hydrology, or if run off is concentrated, may cause erosion to occur (DAFWA, 2009; Van Vreeswyk et al., 2004). These disturbances could occur if access tracks or the proposed waste dump discharge concentrated flows onto adjacent land.

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

It is recommended the following sediment controls be implemented to minimise any potential land degradation:

- A windrow being created along the eastern extent of the Nammuldi Lens EF Waste Dump (NLEFWD) following clearing to minimise sediment transport from the cleared study area into the adjacent drainage basin (Rio Tinto, 2009);
- Wherever possible no new tracks be constructed over the Nammuldi polygon of Wannamunna Land System to the east of the NLEFWD study area (Rio Tinto, 2009);
- Where flows are concentrated, energy dissipaters and level sill structures may be needed to re-establish safe velocities and sheet flow conditions downstream (DAFWA, 2009).

Methodology DAFWA (2009)
Rio Tinto (2009)
Van Vreeswyk et al. (2004)
GIS Database:
-Jeerinah 50cm Othomosaic
-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 situated within a Department of Environment and Conservation managed conservation area (GIS Database). The nearest conservation estate is Karijini National Park, which is situated approximately 51 kilometres south-east of the application area (GIS Database). Based on the distance between the proposal and the nearest conservation area, the proposed clearing is not likely to impact on the conservation value of Karijini National Park.

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 may be at variance to this Principle

There are no permanent watercourses or wetlands within the application area (GIS Database). The application area is positioned within an internally draining basin which is periodically supplied with enough runoff that the resultant drainage pools up in certain places. Rio Tinto (2009) has advised that the area would be better described as a type of floodplain, as it does not appear to hold significant amounts of water for extended periods of time at any significant frequency, such that it might warrant the description of a wetland.

The land systems associated with the application area are regarded as being generally resistant to soil erosion (Van Vreeswyk et al., 2004), thereby reducing the risk of sediment export which may result in sedimentation and turbidity in any nearby watercourses. However, if the red brown loams and duplex soils of the Wannamunna Land System have their surface hydrology disturbed and run off is concentrated, erosion may occur.

The application area is not situated within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Millstream Water Reserve which is located approximately 15 kilometres north of the application area (GIS Database). Given the distance separating the application area and the nearest water supply area, the proposed clearing is unlikely to impact on the quality of the Millstream Water Reserve.

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

It is recommended the following sediment controls be implemented to minimise any potential effects on water quality (Rio Tinto, 2009):

- A windrow being created along the eastern extent of the Nammuldi Lens EF Waste Dump (NLEFWD) following clearing to minimise sediment transport from the cleared application area into the adjacent drainage basin (Rio Tinto, 2009);
- Wherever possible no new tracks be constructed over the Nammuldi polygon of Wannamunna Land System to the east of the NLEFWD study area (Rio Tinto, 2009);
- Where flows are concentrated, energy dissipaters and level sill structures may be needed to re-establish safe velocities and sheet flow conditions downstream (DAFWA, 2009).

Methodology DAFWA (2009)
Rio Tinto (2009)
Van Vreeswyk (2004)
GIS Database:
-Hydrography, Linear
-Public Drinking Water Source Area (PDWSA)

(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 not associated with any permanent wetlands or watercourses (GIS Database). The application area is, however, located within the north western extent of an internally draining basin, with several ephemeral drainage lines entering this area (GIS Database). Rio Tinto (2009) has advised that the area would

be better described as a type of floodplain, as it does not appear to hold significant amounts of water for extended periods of time at any significant frequency.

Hydrogeological studies indicate that similar floodplain surfaces can have fast infiltration rates of 10 millimetres per hour, but which can extend to as fast as 25 millimetres per hour (Tongway, 1995). Consequently surface water from significant rainfall events tends to infiltrate very quickly, delivering any surface water expressions to the groundwater table below in a matter of days or weeks (Rio Tinto, 2009).

The application area experiences average annual rainfall of approximately 400 millimetres (GIS Database; BoM, 2009). The majority of rainfall is received between December and March, continuing through until June, with a pronounced dry period between August and November (ANRA, 2007). Local flooding can be expected to occur in the Pilbara region as a result of heavy rainfall triggered by cyclonic activity and sporadic thunderstorms. With an annual pan evaporation rate of approximately 3400 millimetres (GIS Database), surface flows during normal seasonal rains are short lived (ANRA, 2007). Consequently the clearing of native vegetation within the application area is unlikely to cause or exacerbate the incidence of flooding.

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

Methodology ANRA (2007)
BoM (2009)
Rio Tinto (2009)
Tongway (1995)
GIS Database:
-Hydrography, Linear
-Rainfall, Mean Annual

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

Comments

There is one native title claim over the area under application: WC97/089. This claim has been registered with the National Native Tribunal on behalf of the claimant group. However, the tenement has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (ie. 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 is one known site of Aboriginal significance within the application area, which is now subject to a Section 18 approval under the *Aboriginal Heritage Act 1972* (GIS Database; Rio Tinto, 2009). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no other Sites of Aboriginal Significance are damaged through the clearing process.

The clearing permit amendment was advertised on 12 April 2010 by the Department of Mines and Petroleum (DMP) inviting submissions from the public. No submissions were received during the public comment period.

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.

Clearing permit CPS 3343/1 was granted by the DMP on 24 December 2009 and authorised the clearing of up to 87.9 hectares of native vegetation within an area totalling approximately 88 hectares. Hamersley Iron Pty Ltd applied to DMP on 30 March 2010 to amend clearing permit CPS 3343/1 to increase the total area authorised to clear by 0.16 hectares to 88.06 hectares and to increase the permit boundary to 88.16 hectares.

The proposed increase to the size of the clearing area is due to a heritage site excluded from the original application now being subject to a Section 18 approval under the *Aboriginal Heritage Act 1972*. This area (totalling approximately 0.16 hectares) is now required for waste dump construction.

Methodology GIS Database:
-Aboriginal Sites of Significance
-Native Title Claims

4. Assessor's comments

Comment

The amended proposal has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the Environmental Protection Act 1986, and the proposed clearing is at variance to Principle (f), may be at variance to Principles (g), and (i), is not likely to be at variance to Principles (a), (b), (c), (d), (h) and (j), and is not at variance to Principle (e).

5. References

- ANRA (2007) Australian Natural Resources Atlas: Rangelands Overview; Pilbara. Available online from: <http://www.anra.gov.au/topics/rangelands/overview/wa/ibra-pil.html> Accessed 24 November 2009.
- BoM (2009) Bureau of Meteorology. Climate statistics for Australian locations, Summary statistics for TOM PRICE. http://reg.bom.gov.au/climate/averages/tables/cw_005072.shtml Accessed 02 November, 2009.
- DAFWA (2009) Potential land degradation advice. Advice to assessing officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP) (received 19 November 2009). Department of Agriculture and Food, Western Australia.
- Department of Conservation and Land Management (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions.
- DoW (2009) Potential wetland impact and water quality advice. Advice to assessing officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP) (received 3 December 2009). Department of Water, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Kendrick, P. (2001) Pilbara (PIL3 - Hamersley subregion). In a Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Department of Conservation and Land Management, pp 568-580.
- Rio Tinto (2009) Flora and Vegetation Assessment for the Proposed Brockman 2 Landfill (B2L) site and Nammuldi Waste dump for Pit LEF (NLEFWD) & Supporting Documentation for the Native Vegetation Clearing Permit Application (Purpose Permit). Rio Tinto, Western Australia.
- 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. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Tongway, D. (1995) Monitoring Soil Productive Potential. Commonwealth Scientific and Industrial Research Organisation (CSIRO), National Rangelands Program, Division of Wildlife and Ecology. CSIRO Publishing, Canberra.
- 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, Western Australia.
- Western Australian Museum (2009) NatureMap - Mapping Western Australia's Biodiversity - Department of Environment and Conservation. Available online from: <http://naturemap.dec.wa.gov.au/default.aspx> Accessed 21 November 2009.

6. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government.
CALM	Department of Conservation and Land Management, Western Australia.
DAFWA	Department of Agriculture and Food, Western Australia.
DA	Department of Agriculture, Western Australia.
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DoE), 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, Western Australia.
DoIR	Department of Industry and Resources, Western Australia.
DOLA	Department of Land Administration, Western Australia.
DoW	Department of Water
EP Act	Environment Protection Act 1986, Western Australia.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System.
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	Rights in Water and Irrigation Act 1914, Western Australia.
s.17	Section 17 of the Environment Protection Act 1986, Western Australia.
TECs	Threatened Ecological Communities.

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
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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.