



1. Application details

1.1. Permit application details

Permit application No.: 2565/1
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: Shire Of Ashburton
Colloquial name: Brockman 4

1.4. Application

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

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. One Beard vegetation association is located within the application area:</p> <p>82: Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i> (GIS Database).</p> <p>A vegetation survey of the application area and surrounding region was conducted by Biota Environmental Sciences in 2004 and a survey of an area immediately adjacent to the application area was performed by Pilbara Iron staff in 2007. The vegetation types found during the 2007 survey are expected to be representative of the vegetation types within the application area due to the close proximity of the survey area to the application area, as well as the similarity of landforms between the survey area and application area. Pilbara Iron (2007) have identified the following vegetation types within the survey area:</p> <p>Vegetation of Stony Hills:</p> <p>H2: <i>Eucalyptus leucophloia</i> scattered low trees over <i>Acacia atkinsiana</i> open shrubland over <i>Triodia wiseana</i> mid-dense hummock grassland. Other associated species include <i>Acacia aneura</i>, <i>Senna glutinosa</i>, <i>Hakea chordophylla</i>, <i>Paraneurachne muelleri</i>, <i>Paspalidium clementii</i>, <i>Ptilotus calostachyus</i> var. <i>calostachyus</i> and <i>Solanum lasiophyllum</i>.</p> <p>H3: <i>Eucalyptus leucophloia</i> scattered low trees over <i>Acacia maitlandii</i> shrubland to open heath over <i>Triodia wiseana</i> mid-dense hummock grassland. Other associated species include <i>Acacia atkinsiana</i>, <i>Acacia hamersleyensis</i>, <i>Dampiera candicans</i>, <i>Eriachne mucronata</i>, <i>Indigofera monphylla</i>, <i>Keraudrenia</i></p>	<p>Hamersley Iron Pty Ltd have applied to clear up to 2.8ha of native vegetation within an application area of approximately 31ha for the purpose of mineral exploration. The project will include maintaining and establishing tracks, creation of drill pads (20m x 20m) and the drilling of 45 holes (Hamersley Iron, 2008).</p> <p>The site is located approximately 60km west of Tom Price (GIS Database). The application area is located within a broad valley and lies immediately adjacent to another area that has been previously cleared for mineral exploration (GIS Database). Clearing will be performed using dozer, blade down technique (Hamersley Iron, 2008).</p>	<p>Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994).</p>	<p>No rating of vegetation condition was supplied by the applicant. Vegetation condition has been determined from analysis of aerial photography, which reveals the presence of several tracks within the application area. In addition the application is located within a pastoral lease and so would be expected to have suffered from grazing disturbance. It is likely that the vegetation is in very good condition apart from cleared tracks and weeds.</p>

nephrosperma and *Triodia epactia*.

H8: *Acacia ancistrocarpa* open heath to tall open shrubland over *Triodia wiseana* mid-dense to closed hummock grassland. Other associated species include *A. bivenosa*, *A. marramamba*, *A. pruinocarpa*, *A. synchronicia*, *Senna pruinosa*, *Indigofera monophylla*, and *Ptilotus calostachyus* var. *clostachyus*.

H10: *Eucalyptus leucopholia* low open woodland over *Acacia bivenosa* open shrubland over *Triodia brizoides*, *T. epactia* hummock grassland and *Themeda* sp. Mt Barricade, *Cymbopogon ambiguus* open tussock grassland. Other associated species include *Acacia pyrifolia*, *Eriachne tenuiculmis*, *Gossypium robinsonii*, *Indigofera monophylla*, *Petalostylis labicheoides* and *Triodia wiseana*.

H14: *Eucalyptus leucophloia* scattered low trees over *Triodia wiseana* mid-dense hummock grassland. Other associated species include *Acacia pruinocarpa*, *Hakea chordophylla* and *Solanum lasiophyllum*.

H15: *Eucalyptus leucophloia* scattered low trees over *Triodia epactia* mid-dense hummock grassland. Other associated species include *Acacia pruinocarpa*, *Goodenia stobbsiana*, *Indigofera monophylla* and *Ptilotus calostachyus* var. *calostachyus*.

Vegetation of Plains:

P1: *Acacia aff aneura* (narrow fine veined), *A. ayersiana*, *A. tetragonophylla* tall shrubland over *Eremophila forrestii*, *Acacia bivenosa* shrubland over *Triodia epactia* mid-dense hummock grassland. Other associated species include *A. synchronicia*, *Corymbia hamersleyana* and *Petalostylis labicheoides*.

P3: *Eucalyptus leucophloia* scattered low trees over *Acacia aneura* (various forms), *A. ayersiana*, tall open shrubland over *Triodia epactia*, *T. wiseana* mid-dense hummock grassland. Three forms of mulga were present as dominants in the overstorey strata - *Acacia aff. aneura* (narrow fine veined), *A. aff aneura* (scythe shaped) and *A. aneura* var. *longicarpa*. Other associated species include *A. bivenosa*, *A. stowardii*, *A. synchronicia*, *Ptilotus exaltatus* var. *exaltatus* and *P. polystachyus* var. *polystachyus*.

P4: *Acacia xiphophylla*, *A. aneura* (flat curved) low woodland to tall open shrubland over *Eremophila cuneifolia*, *Rhagodia eremaea* low open shrubland over *Triodia wiseana* open to mid-dense hummock grassland. Other associated species include *A. bivenosa*, *A. synchronicia*, *Senna oligophylla*, *Senna stricta*, *Enchylaena tomentosa*, *Maireana georgei*, *Ptilotus obovatus* var. *obovatus*, *Salsola tragus* and *Solanum lasiophyllum*.

P5: *Acacia xiphophylla*, *A. aff aneura* (narrow fine veined) tall shrubland over *Triodia brizoides*, *T. epactia* open hummock grassland. Other associated species include *A. synchronicia*, *Senna stricta*, *Eucalyptus leucophloia* ssp. *leucophloia*, *ptilotus schwartzii* and *Triodia longiceps*.

P11: *Acacia synchronicia* scattered shrubs over mid-

dense hummock grassland. Other associated species include *A. bivenosa*, *Eucalyptus socialis*, *Maireana georgei*, *Pluchea dentex*, *Triodia brizoides* and *T. longiceps*.

P12: *Acacia synchronicia*, *A. bivenosa*, *Senna pruinosa*, *S. luerssenii* mixed shrubland over *Triodia brizoides* closed hummock grassland. Other associated species include *A. exilis*, *S. oligophylla*, *Solanum lasiophyllum*, *Triodia epactia* and *T. longiceps*.

P15: *Acacia bivenosa*, *A. exilis*, *A. ancistrocarpa* tall open shrubland over *Triodia wiseana* mid-dense hummock grassland. Other associated species include *Petalostylis labicheoides*.

Vegetation of Drainage Areas:

C11: *Acacia citrinoviridis*, *A. ancistrocarpa* tall open shrubland to tall closed scrub over *Triodia epactia* mid-dense hummock grassland. Other associated species include *A. bivenosa*, *A. maitlandii*, *A. synchronicia*, *Bidens bipinnata* (weed), *Senna oligophylla*, *Eriachne tenuiculmis*, *Ptilotus obovatus* var. *obovatus* and *Scaevola spinescens*.

C12: *Acacia monticola*, *A. maitlandii*, *A. atkinsiana* tall open shrubland over *Triodia epactia*, *T. wiseana* mid-dense to open hummock grassland. Other associated species include *A. bivenosa*, *A. citrinoviridis*, *Gossypium robinsonii*, *Grevillea wickhamii* ssp. *hispidula*, *Petalostylis labicheoides*, *Porana commixta*, *Rulingia luteifolia* and *Themeda triandra*.

C16: *Corymbia hamersleyana* scattered low trees over *Acacia bivenosa*, *Petalostylis labicheoides* shrubland over *Triodia epactia* hummock grassland. Other associated species include *A. tetragonophylla*, *Amaranthus pallidiflorus*, *Eriachne mucronata*, *E. tenuiculmis*, *Rhagodia eremaea* and *Santalum lanceolatum*.

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 Interim Biogeographic Regionalisation for Australia (IBRA) subregion (GIS Database). This subregion is generally a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite) (CALM, 2002). The Hamersley subregion consists primarily of 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).

The application area is located within a broad valley towards the centre of the Hamersley Ranges subregion (Biota Environmental Sciences, 2005). The Hamersley Ranges are generally known to have high flora and fauna species diversity and high levels of endemism (Biota Environmental Sciences, 2005). There is very high bird diversity across most of the Pilbara, including the Hamersley Ranges (CALM, 2002).

The application area would be expected to have suffered previous disturbance from grazing, as it is located within the Rocklea and Wyloo pastoral leases (GIS Database). In addition, sites of previous clearing and drilling activities are located immediately adjacent to the application area (GIS Database). As a consequence of these previous disturbances, flora surveys of the application area have recorded the occurrence of several weed species.

Flora surveys of the application area and surrounding region were conducted in 2004 and 2007. The 2007 survey identified 224 flora species from 49 families (Pilbara Iron, 2007). Within the survey area the Grass family (*Poaceae*), Hibiscus family (*Malvaceae*), Wattle family (*Mimosaceae*), Pea family (*Papilionaceae*) and Amaranth family (*Amaranthaceae*) are particularly diverse (Pilbara Iron, 2007), which is typical of the floristics of the

Pilbara IBRA Region (CALM, 2002).

Within the Brockman survey area six weed species were recorded; Ruby Dock (*Acetosa vesicaria*), Buffel Grass (*Cenchrus ciliaris*), Birdwood Grass (*Cenchrus setigerus*), Whorled Pigeon Grass (*Setaria verticillata*), Bipinnate Beggar Tick (*Bidens bipinnata*) and Spiked Malvastrum (*Malvastrum americanum*) (Biota Environmental Sciences, 2005). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. No major infestations were observed (Biota Environmental Sciences, 2005). However, it is recommended that should a permit be granted, conditions be imposed on the permit with regards to weed management.

The assessing officer has searched the Western Australian Museum Fauna Database for fauna occurring within a 50km radius around the application area. The database search found a total of 6 amphibian species, 57 bird species, 23 mammal species and 78 reptile species that may potentially occur within the survey area (Western Australian Museum, 2008). The results of this search suggest that the area is diverse in bird and reptile species, particularly Skinks (23) and Geckos (15) (Western Australian Museum, 2008).

The landforms, vegetation types and fauna habitats in the application area are well represented locally and within the Pilbara region generally (Hamersley Iron, 2008). The proposed clearing of 2.8ha of vegetation within a 31ha application area, will occur in gridlines for the construction of an access track and drill pads (Hamersley Iron, 2008). Therefore, the sparse nature of the proposed clearing is unlikely to have a significant impact upon the biological diversity of the region.

Based on the above, the proposed clearing is not likely to be at variance to this Principle. It is recommended that should a permit be granted, conditions be imposed on the permit with regard to rehabilitation. All cleared topsoil and vegetation, should be stockpiled and rehabilitation should take place within six months of the completion of the activity for which the clearing took place. Rehabilitation should involve re-shaping the surface of each cleared area using the stockpiled topsoil and vegetation.

Methodology Biota Environmental Sciences (2005)
CALM (2002)
Hamersley Iron (2008)
Pilbara Iron (2007)
Western Australian Museum (2008)
GIS Database
- Pre-European Vegetation
- Interim Biogeographic Regionalisation of Australia (subregions)

(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

The assessing officer has conducted a search of the Western Australian Museum's online fauna database for an area representative of a 50km radius around the application area.

This search identified the following species of conservation significance that have the potential to occur within the search area: Long-tailed Dunnart (*Sminthopsis longicaudata*), Lakeland Downs Mouse (*Leggadina lakedownensis*), Pebble-mound Mouse (*Pseudomys chapmani*), Ghost Bat (*Macroderma gigas*), Star Finch (*Neochima ruficauda clarescens*), Partridge Pigeon (*Geophaps smithi smithi*) and a skink (*Notoscincus butleri*) (Western Australian Museum, 2008).

Hamersley Iron requested that the Department of Environment and Conservation (DEC) conduct a search of its threatened fauna database to identify species of conservation significance that have been previously recorded within a 10km radius around the application area. In addition to the species listed above, the following fauna species of conservation significance were identified through this database search: Australian Bustard (*Ardeotis australis*), Bush Stone-curlew (*Burhinus grallarius*) and Striated Grasswren (*Amytornis striatus striatus*) (DEC, 2008).

The vegetation of the application area is not expected to represent significant habitat for the Australian Bustard or the Bush Stone-curlew as these species have wide distributions. In addition the Partridge Pigeon is usually found in the Kimberley and Northern Territory and there is only one record of it occurring as far south as the application area. Therefore, the proposed clearing is unlikely to have any significant impacts on the habitats for these species.

The Long-tailed Dunnart (DEC Priority 4) occurs in rugged rocky landscapes that support low open woodland or shrubland of Acacia's with an understorey of spinifex hummocks, and occasionally perennial grasses (DNREA, 2007). Based on habitat type, this species could potentially occur within the application area. However, given the large amount of suitable vegetation that surrounds the application area, and the sparse nature of the proposed clearing, the clearing of 2.8ha is not expected to have any significant impact on habitat for this species.

The Lakeland Downs Mouse (DEC - Priority 4) is known to occur on sandy soils and cracking clays that support native grasses (DEC, 2006). It is known that this species experiences great fluctuations in population size depending on seasonal factors, reaching plague proportions in good years (DEC, 2006). This species could potentially occur within the application area, however, given the broad distribution of this species and the large amount of suitable vegetation that surrounds the application area, it is unlikely that the proposed clearing will impact on the conservation status of this species.

The skink (DEC - Priority 4) is restricted to the arid north-west of Western Australia (DEC, 2008) and is known to inhabit spinifex dominated areas adjacent to riparian habitats (Wilson and Swann, 2003). Based on habitat type, this species has the potential to occur within the application area. However, due to the small scale of clearing of vegetation types associated with watercourses it is unlikely that the proposed clearing will have any significant impact on habitat for this species.

Western Pebble-mound Mouse (DEC - Priority 4) colonies generally occur on gentler slopes of rocky ranges where the ground is covered by a stony mulch and vegetated by hard Spinifex, often with an overstorey of eucalypts and scattered shrubs (Van Dyck and Strahan, 2008). Mounds are often sited close to narrow ribbons of Acacia-dominated scrub that grow along incised drainage lines (Van Dyck and Strahan, 2008). No mounds have previously been recorded within the application area, however 27 active Pebble-mound Mouse mounds have been recorded in nearby areas (Pilbara Iron, 2007). Therefore, this species has a high chance of occurring within the application area. However, this species is relatively widespread in the Pilbara and given the large amount of suitable habitat that surrounds the application area, it is not likely that the vegetation within the application area is significant habitat for this species on a regional scale.

Striated Grasswrens (DEC - Priority 4) live on sandplains dominated by mature *Triodia* hummock grassland with an over-storey of shrubs (Garnett and Crowley, 2000). The major threat throughout the subspecies' range is fire, especially extensive fires that destroy mature hummock grassland over large areas. There are vast amounts of *Triodia* hummock grassland locally and within the Pilbara region generally, and therefore, the proposed clearing is unlikely to have any significant impact on habitat for this species.

None of the above species are likely to be restricted to the application area. The proposed clearing of 2.8ha within an application area of approximately 31ha is unlikely to have any significant impact on the conservation status of any of these species.

The habitat types found within the application area are well represented locally and within the Pilbara region generally and no fauna species are likely to be restricted to the application area. The sparse nature of the proposed clearing is unlikely to have any significant impacts on fauna habitats within the application area and in addition, disturbance to any habitat types will be temporary as the application area will be rehabilitated upon completion of the project (Hammersley Iron, 2008).

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

Methodology DEC (2006)
DEC (2008)
DNREA (2007)
Garnett and Crowley (2000)
Pilbara Iron (2007)
Van Dyck and Strahan (2008)
Western Australian Museum (2008)
Wilson and Swann (2003)

(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 databases, no Declared Rare or Priority flora species occur within 50km of the application area (GIS Database).

Vegetation surveys of the Brockman project area were conducted in 2004 and 2007 (Hammersley Iron, 2008). No Declared Rare Flora were recorded during the surveys (Hammersley Iron, 2008). At the time of the surveys five Priority flora species were recorded within the survey area, however, two of these species have since been removed from the Priority flora list; *Abutilon trudgeni* ms. and *Sida arsinata*. The other three Priority species were recorded within the entire Brockman project area; *Ptilotus* sp. Brockman (Priority 1), *Phyllanthus aridus* (Priority 3) and *Eremophila magnifica* subsp. *magnifica* (Priority 4) (Hammersley Iron, 2008). It is unlikely that the clearing within gridlines of 2.8ha of native vegetation, will have any significant impact upon any Priority flora.

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

Methodology Hammersley Iron (2008)
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

There are no known Threatened Ecological Communities (TEC's) within the application area (GIS Database). The nearest known TEC is located approximately 35km north of the application area (GIS Database). At such distance from the application area these ecosystems are unlikely to be affected by the proposed clearing.

Hammersley Iron (2008) report that no TEC's have been identified during the flora surveys.

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

Methodology Hammersley Iron (2008)
GIS Database
- Threatened Ecological Communities

(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 IBRA Pilbara Bioregion (GIS Database). Shepherd et al. (2001) report that approximately 99.9% of the pre-European vegetation still exists in this Bioregion (see table). The vegetation in the application area is recorded as Beard Vegetation Association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana* (GIS Database; Shepherd et al., 2001). According to Shepherd et al. (2001) approximately 100% of this vegetation association remains within the Bioregion (see table below).

Therefore, the vegetation within the application area is not a significant remnant of native vegetation within an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	% of Pre-European area in IUCN Class I-IV Reserves (and current %)
IBRA Bioregion – Pilbara	17,804,164	17,794,651	~99.9	Least Concern	6.3
Beard veg assoc. – State					
82	2,565,930	2,565,930	~100.00	Least Concern	10.24
Beard veg assoc. – Bioregion					
82	2,563,610	2,563,610	~100.00	Least Concern	10.2

* Shepherd et al. (2001) updated 2005

** 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)
Shepherd et al. (2001)
GIS Database
- 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

The application area is located in a broad valley within the Hamersley Ranges and is in a semi-desert-tropical region. This region has an average annual rainfall of approximately 300mm falling mainly during the summer months, and an annual average evaporation rate of approximately 2,500mm (ANRA, 2007). Hence the presence of surface water resulting from significant rain events is relatively short-lived.

The application area is located within a *Rights in Water Irrigation Act, 1914 (RIWI Act)* Surface Water Management Area (DoW, 2008). The proponent is required to obtain a Beds and Banks Permit in order to disturb any watercourse. According to available databases, there are no permanent watercourses or wetlands within the application area, however, there are many minor, non-perennial drainage lines within the application

area (GIS Database). Based on the above, these drainage lines are expected to be dry except following heavy rainfall which is usually associated with tropical cyclone events (ANRA, 2007). The access track within the application area will intersect a few minor ephemeral drainage lines and minor creek beds (Hamersley Iron, 2008). If crossings are required for vehicle access, the crossings will be constructed to follow the natural creek bed surfaces and therefore avoid upstream ponding and ensure banks and drainage flow are not significantly altered or interfered with (Hamersley Iron, 2008).

Based on the above, the proposed clearing is at variance to this Principle. However, the proposed clearing is not likely to have any significant impact on any watercourse or wetland due to the small scale of clearing of vegetation types associated with watercourses.

Methodology ANRA (2007)
Hamersley Iron (2008)
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 is broadly mapped as falling within the Newman and Robe Land Systems (GIS Database).

The Newman Land System is described as rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands (Van Vreeswyk et al, 2004). An analysis of aerial photography and topography for the application area reveals that the application area is relatively flat and is most likely to fall within the 'Lower Slope' land unit with some minor areas of 'Stony plains' and 'Narrow drainage floors with channels' (Van Vreeswyk et al., 2004; GIS Database). The soil types within these land units (stony soils, red shallow loams, red loamy earths and red shallow sands) are not susceptible to erosion due to the presence of a stony mantle (Van Vreeswyk et al., 2004).

The Robe Land System consists of erosional surfaces; dissected plateaux and long lines of low mesas along river valleys and steep slopes with gravelly mantles, restricted gravelly lower slopes and closely to moderately spaced narrow tributary drainage floors (Van Vreeswyk et al, 2004). This system is not generally susceptible to erosion or vegetation degradation (Van Vreeswyk et al, 2004). An analysis of aerial photography and topography for the application area reveals the application area is relatively flat and most likely to fall within the 'Lower Slopes', 'Gravelly Plains' and 'Drainage Floors and Channels' (Van Vreeswyk et al., 2004; GIS Database). The soil types within this land unit (red loamy earths, and red shallow loams and minor calcareous shallow loams) are not generally susceptible to erosion (Van Vreeswyk et al., 2004).

Based on the above, the application area is likely to have a reduced soil erosion risk due to the flat topography of the application area and because the land systems are not generally susceptible to erosion.

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 System Mapping
- Topographic Countours, Statewide

(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 nearest conservation area is Karajini National Park located approximately 70km east of the application area (GIS Database). Given the distance of the application area from any conservation areas, the removal of 2.8ha of native vegetation is not expected to have an impact on the environmental values of any conservation areas.

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

Methodology GIS Database
- CALM Managed Land and Waters

(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 located within a *Rights in Water Irrigation Act, 1914 (RIWI Act)* Surface Water Management Area (DoW, 2008). The area is located in a *RIWI Act* Groundwater area. The proponent is required to obtain permits to extract groundwater in this area (DoW, 2008).

There are no permanent waterbodies or watercourses within, or in association with the application area, however, there are numerous small ephemeral drainage lines crossing the application area (GIS Database). Rainfall in this area is mainly restricted to a wet summer season, where precipitation can be variable. Rain can be either intense falls associated with cyclonic events, or scattered falls associated with local thunderstorms. The application area receives average annual rainfall of approximately 300mm and experiences an average annual evaporation rate of approximately 2500mm (ANRA, 2007). Therefore, during normal rainfall events, surface water within the application area is likely to evaporate or be utilised by vegetation quickly.

During normal rainfall events, the proposed clearing would not be expected to lead to an increase in sedimentation of waterbodies on or off site.

The application area is located within the Pilbara Groundwater Area (DoW, 2008). Any extraction of groundwater in this area will require a groundwater licence. The groundwater salinity within the application area is approximately 500 - 1000 milligrams/litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water, however, given the size of the area to be cleared (2.8ha) compared to the size of the Hamersley groundwater province (101,668km) (GIS Database), the proposed clearing is not likely to cause groundwater levels or salinity levels within the application area to alter significantly.

The proposed clearing of 2.8ha of native vegetation, for the purposes of mineral exploration, is not likely to have any significant impact on surface or ground water quality, or groundwater levels.

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

Methodology ANRA (2007)
DoW (2008)
GIS Database
- Groundwater Salinity, Statewide
- Hydrography, Linear

(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 in a broad valley and floodplain associated with numerous minor, ephemeral creeklines (GIS Database). The region is subject to cyclones and natural flooding of the floodplain would occur during extreme rainfall events (Hamersley Iron, 2008). However the clearing of 2.8ha of vegetation, in relation to the size of the Ashburton River catchment area (approximately 7,877,743ha; GIS Database) 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 Hamersley Iron (2008)
GIS Database
- Hydrographic Catchments - Catchments

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

Comments

There is one native title claim (WC01/005) over the application area (GIS Database). This claim has been registered with the National Native Title 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 that 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 several Aboriginal Sites of Significance within the application area (GIS Database). Hamersley Iron have undertaken a heritage survey of the application area and will avoid any Sites of Significance (Hamersley Iron, 2008). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Sites of Significance are damaged through the clearing process.

The application area is located within a *Rights in Water Irrigation Act, 1914 (RIWI Act)* Surface Water Management Area (GIS Database). The proponent is required to obtain a Beds and Banks Permit in order to disturb any watercourse (DoW, 2008). The application area is located in a *RIWI Act* Groundwater Area. The proponent is required to obtain permits to extract groundwater in this area. 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, or any other licences or approvals are required for the proposed works.

There were no public submissions received during the public comments period.

Methodology DoW (2008)

Hamersley Iron (2008)
GIS Database
- Aboriginal Sites of Significance
- Native Title Claims

4. Assessor's comments

Comment

The proposal has been assessed against the Clearing Principles, and is not at variance to Principle (e), is not likely to be at variance to Principles (a), (b), (c), (d), (g), (h), (i) and (j) and is at variance to Principle (f).

Should the permit be granted it is recommended that conditions be imposed on the permit for the purposes of weed management, rehabilitation, record keeping and permit reporting.

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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.
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 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.