



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3906/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Process Minerals International Pty Ltd

1.3. Property details

Property: Mining Lease 46/81
Mining Lease 46/121
Local Government Area: Shire of East Pilbara
Colloquial name: Balfour Downs Manganese Project

1.4. Application

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

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 18 November 2010

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia. One Beard vegetation association has been mapped within the application area (GIS Database; Shepherd, 2007).

29: Sparse low woodland; mulga and *Acacia victoriae* in scattered groups (GIS Database; Shepherd, 2007).

The application area was surveyed by Pilbara Flora staff on the 8 - 12 July 2008 (Pilbara Flora, 2008). The following vegetation types were identified within the application area;

Hilltop Spinifex Grassland: *Acacia melleodora* high open shrubland over *Acacia maitlandii* and *Acacia pruinocarpa* open shrublands over *Triodia basedowii* hummock grassland (84.93ha);

Hilltop Creekline: *Acacia aneura* var *aneura* and *Eucalyptus leucophloia* subsp *leucophloia* low open forest over *Grevillea berryana*, *Dodonaea petiolaris*, *Dodonaea viscosa* open scrub over *Eriachne* and *mucronata* and *Triodia epactia* open tussock/hummock grasslands (14.65ha);

Hilltop Tall Shrubland: *Acacia aneura* var *aneura*, *Acacia paraneura* low open woodland over *Eremophila exillifolia*, *Eremophila latrobei* subsp *latrobei* and *Senna glutinosa* subsp. x *luerssenii* open scrub and *Triodia basedowii* hummock grassland (11.90ha);

Hillside Mulga Groves: *Acacia aneura* var *aneura* low open forest over *Ptilotus obovatus* var *obovatus*, *Dodonaea viscosa*, *Eremophila latrobei* subsp *glabra* over *Eriachne mucronata* and *Triodia epactia*, *Triodia longiceps* tussock / hummock grassland (19.38ha);

Hillside Drainage Line: *Acacia maitlandii* and *Acacia monticola* closed scrub over *Triodia basedowii*, *Triodia epactia* and *Triodia longiceps* hummock grassland (2.65ha);

Hillside Spinifex Woodland: *Acacia aneura* var *aneura* low open woodland over *Acacia arrecta*, *Acacia bivenosa*, *Acacia maitlandii*, *Acacia melleodora* high shrubland over *Triodia basedowii*, *Triodia epactia* and *Triodia longiceps* hummock grassland (33.33ha);

Plains Mulga Groves: *Acacia aneura* spp. low open woodland over *Eremophila cuneifolia*, *Eremophila pensilis*, *Sida* sp spiciform panicles (E. Leyland s.n. 14.8.90) and *Zygophyllum eichleri* open scrubland over *Aristida contorta* and *Triodia longiceps* very open tussock / hummock grasslands (151.63ha);

Plains Spinifex Grassland: *Acacia pruinocarpa* and *Acacia aneura* var *aneura* over *Eremophila pensilis*, *Abutilon lepidum* and *Senna glutinosa* subsp x *luerssenii* open shrubland over *Triodia basedowii*, *Triodia epactia* and *Triodia longiceps* hummock grassland (56.14ha);

Gibber Plains: *Triodia longiceps* very open hummock grassland over *Cleome oxalidea*, *Euphorbia australis* and *Heliotropium heteranthum* scattered forbs (25.54ha);

Low Hills Spinifex Shrubland: *Acacia aneura* var *aneura* and *Acacia paraneura* low open woodland over

Eremophila cuneifolia, *Eremophila forrestii* subsp *forrestii* and *Eremophila pensilis* open shrubland over *Triodia basedowii* closed hummock grassland (41.28ha);

Mulga Drainage Line: *Acacia aneura* spp and *Acacia pruinocarpa* low open forest over *Acacia tetragonophylla*, *Eremophila forrestii* subsp *forrestii*, *Eremophila latrobei* subsp *latrobei*, *Eremophila pensilis* high open shrubland over *Chrysopogon fallax* and *Triodia epactia* tussock / hummock grassland (14.29ha); and

Breakaway Gravelly Scree: *Acacia aneura* var *aneura* high open shrubland over *Eremophila latrobei* subsp *latrobei*, *Acacia maitlandii* and *Senna artemisioides* subsp *helmsii* scattered shrubs over *Triodia basedowii* very open hummock grassland (5.13ha) (Pilbara Flora, 2008).

Clearing Description	Process Minerals International Pty Ltd (PMI) is proposing to clear up to 110 hectares of native vegetation within a 344 hectare area (Process Minerals International, 2010). PMI intend to clear for the development and operation of the Balfour Downs Manganese Project, which will include a conventional open pit mine with onsite processing of ore and tailings discharge into a tailings storage facility (Process Minerals International, 2010). The proposed ancillary facilities will include a workshop, office, laydown area, mobile plant parking bay, laboratory and explosives magazine (Process Minerals International, 2010).
Vegetation Condition	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994); To Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).
Comment	The application area is located in the Pilbara region, approximately 134 kilometres north-east of Newman (GIS Database). The vegetation condition was derived from a vegetation survey conducted by Pilbara Flora (2008).

3. Assessment of application against clearing principles

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

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The application area occurs within the Fortescue Plains (PIL2) subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Fortescue Plains subregion is characterised by alluvial plains and river frontage (CALM, 2002). The eastern portion of the subregion is comprised of extensive salt marsh, mulga-bunch grass and short grass communities on alluvial plains, while deeply incised gorge systems comprise the western part of the drainage (CALM, 2002). An extensive calcrete aquifer feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and Cadjeput <i>Melaleuca</i> woodlands (CALM, 2002).</p> <p>The vegetation within the application area consists of Beard vegetation association 29 which is common and widespread throughout the Pilbara bioregion, with approximately 100% of the pre-European vegetation extent remaining (Shepherd, 2007; GIS Database). Pilbara Flora (2008) recorded 146 plant taxa from 67 genera and 31 families during the vegetation survey of the application area. This is considered to be consistent with the high species diversity of the Pilbara region. No Declared Rare Flora or Priority flora species were recorded within the application area (Pilbara Flora, 2008).</p> <p>Five broad habitat types were recorded as occurring within the application area;</p> <ol style="list-style-type: none">1. Hill;2. Gorge;3. Gully;4. Plain; and5. Major Drainage (Rapallo, 2008). <p>The habitat types at the Balfour Downs Mine are not unique or restricted and occur widely throughout the Pilbara (Process Mineral International, 2010). Whilst the proposed clearing of 110 hectares for the Balfour Downs Mine may impact on the availability of suitable habitat for fauna in a local context, it is unlikely to have a significant impact in a regional context.</p> <p>Five alien weed species were recorded within the application area (Pilbara Flora, 2008). These were: Buffel Grass (<i>Cenchrus ciliaris</i>), Birdwood Grass (<i>Cenchrus setiger</i>), Spiked Malvastrum (<i>Malvastrum americanum</i>), Whorled Pigeon Grass (<i>Setaria verticillata</i>) and Bipinnate Beggartick (<i>Bidens bipinnata</i>) (Pilbara Flora, 2008). 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. None of these species are listed as a 'Declared Plant' species under the <i>Agriculture and Related Resources Protection Act 1976</i> by the Department of Agriculture and Food (DAFWA). Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.</p> <p>Based on the above, the proposed clearing is not likely to be at variance to this Principle.</p>
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Methodology	CALM (2002) Pilbara Flora (2008) Process Minerals International (2010) Rapallo (2008)
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Shepherd (2007)
GIS Database:
- IBRA WA (regions - subregions)
- Pre-European vegetation

(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

According to Shepherd (2007) approximately 100% of the pre-European vegetation remains within the Pilbara bioregion. Given the extent of native vegetation remaining in the local area and bioregion, the vegetation to be cleared does not represent a significant ecological linkage.

In 2008, a fauna survey of the Balfour Downs Project Area was undertaken by Rapallo Consulting and Contracting Engineers (Rapallo) (2008). The field survey was conducted on 8 to 14 July 2008 (Rapallo, 2008).

Rapallo (2008) recorded five broad habitat types and 15 micro habitat types as occurring within the survey area:

1. **Hill**
 - 1.1. Eastern Hill Slope Microhabitat;
 - 1.2. Northern Hill Slope Microhabitat;
 - 1.3. South Eastern Aspect-Hill Lower Slopes Microhabitat;
 - 1.4. South Eastern Aspect-Hill Top Slopes Microhabitat;
 - 1.5. Hill Top Gully Microhabitat; and
 - 1.6. Hill Top Microhabitat.
2. **Gorge**
 - 2.1. Gorge Habitat.
3. **Gully**
 - 3.1. Gully Microhabitat 1; and
 - 3.2. Gully Microhabitat 2.
4. **Plain**
 - 4.1. *Triodia* Hummock Grassland of *Triodia epactia* and *Triodia basedowii* with Open *Acacia* Shrubland Microhabitat;
 - 4.2. Low hills of *Triodia wiseana* Hummock Grasslands with Siltstone Microhabitat;
 - 4.3. *Triodia wiseana* Dominated Hummock Grassland Microhabitat;
 - 4.4. Gibber Plain Microhabitat; and
 - 4.5. Sparse Open *Acacia* shrubland over *Triodia basedowii* Microhabitat.
5. **Major Drainage**
 - 5.1. Floodplain (Rapallo, 2008).

Rapallo (2008) undertook a risk assessment on the likelihood of occurrence based on habitat for fauna species of conservation significance. According to this risk assessment, the Bilby, Night Parrot, Princess Parrot, Oriental Plover and Fork-tailed Swift have a medium likelihood of occurring within the application area. While the Grey Falcon, Bush Stone-Curlew, Rainbow Bee-eater and *Lerista macropisthopus remota* have a high likelihood of occurring within the application area (Rapallo, 2008). Only the Rainbow Bee-eater was observed during the survey undertaken by Rapallo (2008).

Rapallo (2008) determined that the vegetation communities and fauna habitats are not likely to be restricted to the application area. Aerial imagery confirms the presence of similar landforms and hydrological features outside of the application area which are likely to support similar fauna habitats. These areas will not be disturbed by the proposed clearing activities. The vegetation is not likely to support restricted or significant habitat for fauna species.

The vegetation under application does not form part of a remnant of native vegetation, and does not represent an important ecological linkage.

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

Methodology Rapallo (2008)
Shepherd (2007)
GIS Database:
- Balfour Downs 1.4m Orthomosaic - Landgate 2003
- Hydrography, linear
- 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

According to available GIS databases there are no known records of Declared Rare Flora (DRF) within the application area (GIS Database).

A flora survey was conducted over the application area by staff from Pilbara Flora on 8-12 July 2008 (Pilbara Flora, 2008). No DRF or Priority flora species were recorded within the application area (Botanica Consulting, 2010).

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

Methodology Pilbara Flora (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

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest TEC is located approximately 108 kilometres south-west of the application area (Ethel George) (DEC, 2006). At this distance there is little likelihood of any impact to the TEC from the proposed clearing.

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

Methodology DEC (2006)
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 falls within the Pilbara IBRA bioregion (GIS Database). Shepherd (2007) reports that approximately 99.95% of the pre-European vegetation remains in this bioregion.

The vegetation within the application area is recorded as Beard vegetation association:

29: Sparse low woodland; mulga and *Acacia victoriae* in scattered groups (GIS Database; Shepherd, 2007).

According to Shepherd (2007) approximately 100% of these Beard vegetation associations remain within the Pilbara bioregion (see table below).

	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 vegetation associations - State					
29	7,903,991	7,903,991	~100%	Least Concern	~0.3%
Beard vegetation associations - Bioregion					
29	1,133,219	1,133,219	~100%	Least Concern	~1.9%

* Shepherd (2007)

** 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 (2007)
GIS Database:
- IBRA WA (regions - subregions)
- 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

According to available GIS Databases, there are no permanent wetlands or watercourses within the application area (GIS Database). The Oakover River is the main regional river and is located approximately 17 kilometres

east of the application area (GIS Database; Pilbara Flora, 2008).

Based on vegetation mapping conducted by Pilbara Flora (2008) three of the twelve vegetation associations found within the application area are associated with drainage areas.

Hilltop Creekline: *Acacia aneura* var *aneura* and *Eucalyptus leucophloia* subsp *leucophloia* low open forest over *Grevillea berryana*, *Dodonaea petiolaris*, *Dodonaea viscosa* open scrub over *Eriachne mucronata* and *Triodia epactia* open tussock/hummock grasslands (14.65ha);

Hillside Drainage Line: *Acacia maitlandii* and *Acacia monticola* closed scrub over *Triodia basedowii*, *Triodia epactia* and *Triodia longiceps* hummock grassland (2.65ha); and

Mulga Drainage Line: *Acacia aneura* spp and *Acacia pruinocarpa* low open forest over *Acacia tetragonophylla*, *Eremophila forrestii* subsp *forrestii*, *Eremophila latrobei* subsp *latrobei*, *Eremophila pensilis* high open shrubland over *Chrysopogon fallax* and *Triodia epactia* tussock / hummock grassland (14.29ha) (Pilbara Flora, 2008).

There are several minor non-perennial watercourses located within the application area, which are all tributaries of the Oakover River (GIS Database; Pilbara Flora, 2008). Analysis of aerial photography and imagery indicates that similar flowlines are common in the surrounding region. The habitat within the study area would therefore not be considered to support a unique or restricted wetland habitat requiring special consideration.

Based on the above, the proposed clearing may be at variance to this Principle. However, the proposed clearing is not likely to significantly impact on the conservation of vegetation growing in association with permanent watercourses or wetlands due to the absence of these features within the application area. The proposed clearing of native vegetation is unlikely to significantly impact on vegetation communities growing in association with drainage channels, as they are common and widespread within the region. Should any watercourses be disturbed the proponent should liaise with the Department of Water to determine whether a Bed and Banks permit is necessary for the proposed works.

Methodology Pilbara Flora (2008)
GIS Database:
- Balfour Downs 1.4m Orthomosaic - Landgate 2003
- Geodata - Lakes
- Hydrography - Linear
- NATMAP 250K series mapping

(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

The application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al., 2004). According to available datasets the application area intersects the Balfour, Billygoat and Robertson land systems (GIS Database).

The Balfour land system consists of shale, gravel and clay plains supporting *Eremophila-Cassia* shrublands, tussock grasslands and halophytic shrublands (Van Vreeswyk et al., 2004). Some parts of this land system (gilgai plains, gravelly plains and alluvial plains) are slightly to moderately susceptible to erosion if vegetative cover is lost (Van Vreeswyk et al., 2004).

The Billygoat land system is comprised of dissected plains and slopes supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). The Robertson land system consists of hills and ranges of sedimentary rocks supporting hard spinifex grasslands (Van Vreeswyk et al., 2004). Neither of these land systems are susceptible to erosion.

Based on the above, the proposed clearing may be at variance to this Principle. Potential erosion impacts as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition to ensure large areas are not void of vegetative cover for extended periods.

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 proposed clearing is not located within a conservation reserve (GIS Database). The nearest known conservation reserve is Karlamilyi National Park, located approximately 75.5 kilometres east of the application area (GIS Database).

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**

There are no permanent wetlands or watercourses within the application area (GIS Database). The Oakover River is the main regional river and is located approximately 17 kilometres east of the application area (GIS Database; Pilbara Flora, 2008). There are several minor non-perennial watercourses located within the application area, which are all tributaries of the Oakover River (GIS Database; Pilbara Flora, 2008).

Given that the application area receives approximately 310.2 millimetres of rainfall per year and experiences a mean annual evaporation of approximately 3,800 millimetres (BoM, 2010; GIS Database), surface water flows within the Balfour Downs Project Area generally only occur during intense cyclonic events, and in response to surface runoff from exposed rock surfaces. However, as there are no permanent or semi-permanent surface water features within the application area, the proposed clearing activities are not likely to cause deterioration in the quality of surface water.

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database). The nearest PDWSA is the Newman Water Reserve which is located approximately 97 kilometres south-west of the application area. Given the distance separating the application area and the Newman Water Reserve, the proposed clearing is unlikely to impact on the water quality of the Newman Water Reserve.

The application area is located within the proclaimed Pilbara groundwater area under the *Rights in Water and Irrigation Act 1994* (RIWI) (Process Minerals International, 2010; GIS Database). Any groundwater extraction and/or taking or diversion of surface water for the purposes other than domestic and/or stock watering is subject to licence by the Department of Water.

The application area is characterised by the Oakover River hydrographic catchment area (GIS Database). The application area, which includes the proposed open pit, processing facilities, offices and workshops, laydown areas, parking bays, laboratory and explosives magazine, is situated within the Oakover River catchment which covers a total area of approximately 2,001,756 hectares (GIS Database).

The application area is dominated by a north-east - south-west trending hill surrounded by a plain (Rapallo, 2008). The hill is dominated by open Acacia shrubland over several species of *Triodia*. The surrounding plains are also dominated by open Acacia shrubland over *Triodia* (Rapallo, 2008).

PMI report that groundwater levels within the application area occur at depths greater than 40 metres below the surface (Process Minerals International, 2010). The groundwater salinity within the application area is approximately 1,000-3,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). Given the depth to groundwater and low rainfall to high evaporation rate, the proposed clearing of 110 hectares of native vegetation is not likely to significantly increase groundwater recharge which could otherwise lead to significant rises in ground water levels. The proposed clearing is not likely to cause deterioration in the quality of groundwater in the local area.

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

Methodology BoM (2010)
Pilbara Flora (2008)
Process Minerals International (2010)
Rapallo (2008)
GIS Database:
- Evaporation Isopleths
- Groundwater Salinity, Statewide
- Hydrographic Catchments - Catchments
- Public Drinking Water Source Areas
- RIWI Groundwater Areas
- 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 experiences a tropical semi-desert climate (CALM, 2002). The average annual rainfall of Newman, which is situated approximately 134 kilometres south-west of the application area is 310.2 millimetres and the area experiences a mean annual evaporation of approximately 3,800 millimetres (BoM, 2010; GIS Database). Newman climate statistics indicate that rainfall in the region is mainly during summer and is typically experienced as cyclonic events (BoM, 2010; CALM, 2002).

Shepherd (2007) vegetation statistics indicate that approximately 100% of the pre-European vegetation extent remains within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) region. The proposed clearing of up to 110 hectares of native vegetation constitutes only a very small proportion of the size of the Oakover River catchment (less than approximately 0.006% of the total catchment area) which remains largely uncleared (GIS Database; Shepherd, 2007). Vegetation is considered an important ground cover as it slows surface water flows, and enables rainwater to infiltrate the soil to depths where it can be utilised by vegetation. Given that the Pilbara bioregion, as well as the surrounding regions, remain largely uncleared (Shepherd, 2007), the proposed clearing is not likely to impact on the drainage characteristics of the Oakover River catchment area.

Given that there are no watercourses, wetlands or flood generating water catchments within the application area (GIS Database; Process Mineral International, 2010), the proposed clearing of 110 hectares of native vegetation is not expected to increase the incidence or intensity of flooding. PMI have also advised that all runoff from site will be contained to ensure that there is no flood impact from rainfall occurring within the mining footprint (Process Minerals International, 2010).

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

Methodology BoM (2010)
CALM (2002)
Shepherd (2007)
Process Minerals International (2010)
GIS Database:
- Evaporation Isopleths
- Hydrographic Catchments - Catchments
- Towns

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

Comments

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

It is noted that the proposed clearing may impact on a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of the Environment, Water, Heritage and the Arts (DEWHA) for environmental impact assessment under the EPBC Act. The proponent is advised to contact the DEWHA for further information regarding notification and referral responsibilities under the EPBC Act.

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.

The clearing permit application was advertised on 4 October 2010 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this proposal.

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

4. References

- BoM (2010) Bureau of Meteorology Website - Climate Averages by Number, Averages for NEWMAN. www.bom.gov.au/climate/averages/tables/cw_007151.shtml (Accessed 11 November 2010).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 2 (PIL2-Fortescue Plains subregion) Department of Conservation and Land Management, Western Australia.
- DEC (2006) List of Threatened Ecological Communities on the Department of Environment and Conservation's Threatened Ecological Community (TEC) Database endorsed by the Minister for the Environment. Species and Communities Branch, Department of Environment and Conservation.
- 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.
- Pilbara Flora (2008) Flora and Vegetation Survey-Balfour Downs Manganese Project. Unpublished report prepared for Process Mineral International Pty Ltd, September 2008.
- Process Minerals International (2010) Supporting information for a Native Vegetation Clearing Permit Application-Purpose Permit-Balfour Downs Manganese Project M46/81 and M46/121. Process Mineral International Pty Ltd, July 2010.
- Rapallo (2008) Balfour Downs Project Fauna Reconnaissance Survey. Unpublished report prepared for Process Minerals International, September 2008.
- 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., Hennig, P., and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia, Department of Agriculture, 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	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (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	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, 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.

