



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 4990/1  
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 (AML 70/4)  
Local Government Area: Shire of Ashburton  
Colloquial name: Vivash Drilling Programme

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
30		Mechanical Removal	Mineral Exploration and Access Tracks

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 14 June 2012

## 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 for the whole of Western Australia and are useful to look at vegetation in a regional context. The following Beard vegetation associations have been mapped within the application area:

Beard vegetation association 82: Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and  
Beard vegetation association 567: Hummock grasslands, shrub steppe; mulga and kanji over soft spinifex & *Triodia basedowii* (GIS Database; Government of Western Australia, 2011).

A flora and vegetation survey of the application area was conducted by a botanist from Rio Tinto Iron Ore Pty Ltd (Rio Tinto) on 20 and 22 to 27 October 2011. The following 32 vegetation units were recorded within the application area (Rio Tinto, 2012):

#### Hill Slope Vegetation

HS1: *Hakea lorea* low open woodland over *Acacia maitlandii*, *Senna glutinosa*, *S. ferraria*, *Gossypium robinsonii* shrubland over *Acacia spondylophylla* low open heath over *Triodia wiseana* hummock grassland;  
HS2: *Eucalyptus leucophloia*, *Ficus brachypoda* low woodland over *Senna pruinosa*, *S. glutinosa* shrubland over *Triodia pungens*, *T. wiseana* hummock grassland over *Eriachne mucronata* very open tussock grassland;  
HS3: *Eucalyptus gamophylla*, *E. leucophloia* low open forest over *Acacia maitlandii*, *Senna glutinosa* open shrubland over *Acacia spondylophylla* low open shrubland over *Triodia wiseana* hummock grassland;  
HS4: *Eucalyptus leucophloia* low woodland over *Acacia atkinsiana*, *A. pruinocarpa* open scrub over *Triodia wiseana* hummock grassland;  
HS5: *Eucalyptus leucophloia*, *Corymbia ferriticola*, *Ficus brachypoda* low open forest over *Acacia maitlandii* shrubland over *Triodia wiseana* hummock grassland;  
HS6: *Eucalyptus leucophloia* low open woodland over *Acacia pruinocarpa*, *A. atkinsiana* open shrubland over *Acacia maitlandii* low open heath over *Triodia pungens*, *T. wiseana* hummock grassland;  
HS7: *Eucalyptus leucophloia*, *Hakea lorea* low woodland over *Senna glutinosa* open shrubland over *Triodia wiseana* hummock grassland;  
HS8: *Eucalyptus leucophloia*, *E. pilbarensis* low woodland over *Acacia atkinsiana*, *A. exilis* shrubland over *Triodia pungens*, *T. wiseana* hummock grassland over *Amphipogon carcinus* very open tussock grassland;  
HS9: *Eucalyptus leucophloia* low open woodland over *Acacia inaequilatera*, *A. aneura* high open shrubland over *Acacia maitlandii*, *A. synchronicia*, *A. bivenosa* open scrub over *Triodia wiseana* hummock grassland;  
HS10: *Eucalyptus leucophloia* low open woodland over *Acacia bivenosa*, *Senna pruinosa* open shrubland over *Triodia wiseana* hummock grassland;  
HS11: *Corymbia hamersleyana* scattered low trees over *Acacia arida* low open heath over *Triodia wiseana* hummock grassland; and  
HS12: *Acacia inaequilatera* open scrub over *Acacia synchronicia*, *A. bivenosa*, *Senna pruinosa* open shrubland over *Triodia pungens* hummock grassland.

#### Cliff and Breakaway Vegetation

CB1: *Eucalyptus leucophloia*, *Ficus brachypoda* low open woodland over *Acacia pruinocarpa*, *A. citrinoviridis* high open shrubland over *Senna glutinosa* open shrubland over *Triodia pungens*, *T. wiseana* hummock

grassland;  
**CB2:** *Eucalyptus leucophloia*, *Corymbia ferritcola* low woodland over *Astrotricha hamptonii* high open shrubland over *Senna glutinosa* open shrubland over *Triodia wiseana*, *T. pungens* hummock grassland over *Themeda triandra*, *Cymbopogon ambiguus*, *Eriachne mucronata* open tussock grassland; and  
**CB3:** *Eucalyptus leucophloia*, *Corymbia ferritcola* low open woodland over *Acacia hamersleyensis*, high shrubland over *Triodia wiseana* hummock grassland over *Eriachne mucronata* very open tussock grassland.

**Low Areas Vegetation**

**L1:** *Eucalyptus leucophloia* low open woodland *Acacia kempeana*, *A. bivenosa* open scrub over *Triodia pungens* hummock grassland;  
**L2:** *Corymbia hamersleyana* low open woodland over *Acacia inaequilatera* high shrubland over *Acacia bivenosa* shrubland over *Triodia pungens* hummock grassland; and  
**L3:** *Acacia citrinoviridis*, *A. bivenosa* open scrub over *Triodia pungens* hummock grassland.

**Gorge Vegetation**

**G1:** *Corymbia ferritcola* low woodland over *Acacia hamersleyensis*, *Dodonaea pachyneura*, *D. viscosa* high shrubland over *Corchorus lasiocarpus* low open shrubland over *Triodia wiseana*, *T. pungens* hummock grassland over *Eriachne mucronata*, *Themeda triandra* open tussock grassland.

**Ephemeral Watercourse Vegetation**

**EW1:** *Corymbia hamersleyana*, *Clerodendrum floribundum* var. *angustifolium* low open woodland over *Acacia monticola*, *Gossypium robinsonii* high shrubland over *Acacia bivenosa*, *A. pyrifolia*, *A. maitlandii*, *Indigofera bungarensis*, *Gastrolobium grandiflorum* shrubland over *Tephrosia rosea* low open shrubland over *Triodia pungens* open hummock grassland over *Eriachne tenuiculmis*, *Themeda triandra* very open tussock grassland;  
**EW2:** *Eucalyptus victrix*, *E. camaldulensis* open forest over *Acacia citrinoviridis*, *A. coriacea*, *Melaleuca glomerata* high shrubland over *Acacia pyrifolia*, *A. bivenosa*, *A. maitlandii* open shrubland over *Triodia pungens* open hummock grassland over *Eriachne tenuiculmis* open tussock grassland;  
**EW3:** *Acacia citrinoviridis*, *A. pyrifolia*, *Petalostylis labicheoides*, *Stylobasium spathulatum* open scrub over *Acacia bivenosa* open shrubland over *Triodia pungens* very open hummock grassland over *Eriachne tenuiculmis*, *Dichanthium sericeum* open tussock grassland; and  
**EW4:** *Eucalyptus camaldulensis* woodland over *Acacia pyrifolia*, *Indigofera* sp. Bungaroo Creek, *Tephrosia rosea* low open shrubland over *Argemone ochroleuca* very open herbs.

**Drainage line Vegetation**

**D1:** *Rulingia luteiflora*, *Gastrolobium grandiflorum*, *Acacia monticola* closed scrub over *Triodia pungens* scattered hummock grass over *Cenchrus ciliaris* scattered tussock grass;  
**D2:** *Eucalyptus leucophloia* low open woodland over *Acacia bivenosa*, *A. monticola*, *A. pruinocarpa* high shrubland over *Triodia wiseana* hummock grassland; and  
**D3:** *Eucalyptus leucophloia* low open woodland over *Acacia citrinoviridis*, *Stylobasium spathulatum*, *Gossypium robinsonii* high shrubland over *Acacia bivenosa*, *A. maitlandii* shrubland over *Triodia pungens* open hummock grassland.

**Hilltop Vegetation**

**HT1:** *Eucalyptus leucophloia* low open woodland over *Acacia inaequilatera*, *A. pruinocarpa* high open shrubland over *Acacia maitlandii*, *A. bivenosa*, *Senna glutinosa* shrubland over *Triodia wiseana* hummock grassland over *Eriachne mucronata* very open tussock grassland;  
**HT2:** *Eucalyptus leucophloia* low open woodland over *Acacia aneura*, *A. pruinocarpa*, *A. atkinsiana* open scrub over *Triodia wiseana* hummock grassland; and  
**HT3:** *Eucalyptus leucophloia* low open woodland over *Acacia maitlandii* shrubland over *Acacia arida* low shrubland over *Triodia wiseana* hummock grassland.

**Floodplain Vegetation**

**FP1:** *Corymbia hamersleyana* low open woodland over *Acacia pyrifolia*, *A. citrinoviridis* open scrub over *Scaevola spinescens* low open shrubland over *Triodia pungens* very open hummock grassland over *Cenchrus ciliaris* very open tussock grassland; and  
**FP2:** *Acacia pyrifolia*, *A. citrinoviridis* open scrub over *Cenchrus ciliaris* closed tussock grassland.

**Plains Vegetation**

**P1:** *Acacia xiphophylla* open shrub over *Acacia synchronicia* open shrubland over *Maireana pyramidata* low open shrubland over *Triodia pungens* very open hummock grassland.

**Clearing Description**

Hamersley Iron Pty Ltd is proposing to clear up to 30 hectares of native vegetation within a 171 hectare application area, for the purpose of mineral exploration and access tracks.

The vegetation will be cleared using a blade down technique where practicable or scrub rake in level terrain. Where already cleared tracks require maintenance, the track may be graded using blade down technique.

**Vegetation Condition**

Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery, 1994);

To:

Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

**Comment**

The application area is located in the Hamersley subregion of Western Australia and is situated approximately 75 kilometres west of the Tom Price town site (GIS Database).

### 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 Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). This subregion is characterised by alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, *Sporobolus* and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite (CALM, 2002).

A flora and vegetation survey was undertaken by Rio Tinto (2012) during October 2011 over the application area and surrounding region totalling 822 hectares. The flora and vegetation survey of the application area identified 32 different vegetation units (Rio Tinto, 2012). Of these, the vegetation units of the Bungaroo Creek recorded by Rio Tinto (2012) are considered to have elevated conservation significance. The riparian vegetation of the Bungaroo Creek includes the vegetation units EW1, EW2, EW3 and EW4. The remaining vegetation types present within the application area are widely distributed within the Hamersley subregion (Rio Tinto, 2012). None of the vegetation communities recorded is considered to be a Threatened or Priority Ecological Community (Rio Tinto, 2012). The flora and vegetation survey of the application area recorded a total of 129 native flora taxa from 63 genera and 28 families (Rio Tinto, 2012). The number of native species recorded was within the expected range for the size and locality of the survey and is considered to represent average species richness (Rio Tinto, 2012). The condition of the vegetation was determined to be 'very good' with some areas affected by introduced species in a 'degraded' condition (Rio Tinto, 2012; Keighery, 1994).

A search of the Department of Environment and Conservations Threatened and Priority Flora databases revealed that one Threatened Flora species and four Priority species may potentially occur within a 20 kilometre radius of the application area (DEC, 2012). There were five species of Priority Flora recorded within the application area (Rio Tinto, 2012): - *Spartothamnella puberula* (Priority 2); - *Indigofera* sp. Bungaroo Creek (Priority 3); - *Eremophila magnifica* subsp. *velutina* (Priority 3); - *Acacia bromilowiana* (Priority 4) and *Rhynchosia bungarensis* (Priority 4). Hamersley Iron Pty Ltd have committed to placing a restriction zone around the populations where feasible (Rio Tinto, 2012). These priority species have been recorded more widely throughout the Hamersley subregion (DEC, 2012) and the proposed clearing is not expected to significantly impact these species. No Threatened Flora species were recorded (Rio Tinto, 2012).

Three fauna habitat types were identified by Rio Tinto (2012) within the application area (GIS Database). These habitats are considered to be common and widespread within the subregion and faunal assemblages are unlikely to be different to that found in similar habitat located elsewhere in the region (Rio Tinto, 2012; GIS Database). There were two small shallow caves found within the application area along the western boundary of the application area (GIS Database). The nature of the project and the clearing of 30 hectare of native vegetation within an application area of 171 hectares is unlikely to have a significant impact on these faunal assemblages.

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

##### Methodology

DEC (2012)  
CALM (2002)  
Keighery (1994)  
Rio Tinto (2012)  
GIS Database:  
- IBRA WA (Regions - Subregions)  
- Pre-European vegetation  
- Threatened Ecological Sites Buffered

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

##### Comments

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

A desktop review of the potential fauna species occurring within the application area was conducted by Rio Tinto (2012). During the flora and vegetation survey by Rio Tinto (2012), opportunistic and incidental sightings of fauna and faunal habitats were also made. Rio Tinto (2012) identified three primary fauna habitats within the application area:

1. Hill tops and slopes;
2. Flats and low areas; and
3. Drainage and creek line areas.

Two small shallow caves were also identified along the western boundary of the application area (Rio Tinto, 2012). The nature of the project and the clearing of 30 hectare of native vegetation within an application area of 171 hectares is unlikely to have a significant impact on these caves. The primary habitats present within the application area are reasonably widespread in the locality and none were identified as being of conservation

significance (Rio Tinto, 2012).

There are 16 species of fauna listed as Threatened Species under the *Environment Protection and Biodiversity Conservation Act 1999* or protected under Western Australian legislation (*Wildlife Conservation Act, 1950*), which may potentially occur within the application area based on habitat type and vegetation mapping associated with the tenement. The majority of the conservation significant fauna identified are unlikely to occur within the application area due to lack of suitable habitat (Rio Tinto, 2012). There was one Australian Bustard (*Ardeotis australis*) sighted and one Western Pebble-mound Mouse (*Pseudomys chapmani*) mounds located within the application area (Rio Tinto, 2012). Both of these species are highly mobile and/or have a wide distribution so the clearing is unlikely to significantly impact on these species (Rio Tinto, 2012; DEC, 2012). Rio Tinto (2012) have committed to avoiding the Western Pebble-mound Mouse mound where feasible.

The nature of the project and the clearing of 30 hectare of native vegetation within an application area of 171 hectares is unlikely to have a significant impact on these faunal assemblages.

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

**Methodology** DEC (2012)  
Rio Tinto (2012)  
GIS Database:  
- Rocklea 50cm Orthomosaic - Landgate 2004  
- Pre-European Vegetation  
- IBRA WA (regions - subregions)

**(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, there are no records of Threatened Flora within the application area (GIS Database). A search of the Department of Environment and Conservation's Threatened and Priority Flora databases identified no Threatened Flora species as occurring within a 20 kilometre radius of the application area (DEC, 2012).

Rio Tinto (2012) conducted a vegetation and flora survey of the application area on 20 and 22 to 27 October 2011. No Threatened Flora species were recorded within the survey area.

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

**Methodology** DEC (2012)  
Rio Tinto (2012)  
GIS Database:  
- Threatened and Priority Flora

**(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.**

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

A search of the available databases shows that there are no Threatened Ecological Communities situated within 50 kilometres 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:  
- Threatened Ecological Sites Buffered

**(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.**

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

The application area falls within the Pilbara IBRA bioregion (GIS Database). The vegetation within the application area is recorded as:

**Beard vegetation association 82:** Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*; and

**Beard vegetation association 567:** Hummock grasslands, shrub steppe; mulga & kanji over soft spinifex & *Triodia basedowii* (GIS Database; Government of Western Australia, 2011).

According to the Government of Western Australia (2011), Beard vegetation associations 82 and 567 retain approximately 99% of their pre-European extent. Therefore, the area proposed to be cleared is not a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,427	17,729,352	~99.58	Least Concern	6.34
<b>Beard vegetation associations - State</b>					
82	2,565,901	2,553,217	~99.51	Least Concern	10.24
567	777,507	774,896	~99.66	Least Concern	22.33
<b>Beard vegetation associations - Bioregion</b>					
82	2,563,583	2,550,899	~99.51	Least Concern	10.25
567	776,824	774,213	~99.66	Least Concern	22.35

\* Government of Western Australia (2011)

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

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

**Methodology** Department of Natural Resources and Environment (2002)  
Government of Western Australia (2011)  
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 is at variance to this Principle**

According to the available databases, there are numerous ephemeral drainage lines present within the application area (GIS Database). There were four vegetation units (EW1, EW2, EW3 and EW4) that were identified as 'ephemeral watercourse vegetation' (Rio Tinto, 2012). CALM (2002) lists 'all major ephemeral watercourses' within the Hamersley subregion as ecosystems that are 'at risk - vulnerable'. The riparian vegetation was considered to be in 'very good' condition (Keighery, 1994). Clearing of areas which contain riparian vegetation have the potential to cause localised erosion to the creek habitat, however Hamersley Iron Pty Ltd do not expect to significantly impact the hydrological functions of these drainage systems (Rio Tinto, 2012). Potential impacts to riparian vegetation may be minimised through the implementation of a vegetation management condition.

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

**Methodology** CALM (2002)  
Keighery (1994)  
Rio Tinto (2012)  
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**

According to available databases, the application area is predominately comprised of the Newman land system (GIS Database).

The Newman land system is characterised by rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands which is not generally prone to erosion (Van Vreeswyk et al., 2004). At a broad scale the surface soil pH of the application area is 5.5 to 6.0 and there is no known occurrence of acid sulphate soils (CSIRO, 2012). The average annual evaporation rate significantly exceeds the annual average rainfall so there is a low probability of the proposed clearing causing increased groundwater recharge resulting in rising saline water tables (BoM, 2012).

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

**Methodology** BoM (2012)  
CSIRO (2012)  
Van Vreeswyk et al. (2004)  
GIS Database  
- Rangeland Land System Mapping

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

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

The application area is not located within any conservation area (GIS Database). The nearest conservation area is the Karijini National Park, located approximately 87 kilometres east of the application area (GIS Database).

Given the distance of the application area from the Karijini National Park, the proposed clearing is not likely to provide a significant ecological linkage or fauna movement corridor and is not likely to impact the environmental values of the conservation area.

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

**Methodology** GIS Database:  
- DEC Tenure

**(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

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

The application area is not located within a Public Drinking Water Source Area (GIS Database). The application area is located within the proclaimed Pilbara groundwater area under the *Rights in Water and Irrigation Act 1994* (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.

There are several minor non-perennial watercourses within the application area (GIS Database). The majority of the surface water within the application area is likely to occur as sheet flow following heavy rains. With an annual evaporation rate significantly exceeding the average annual rainfall any surface water is likely to evaporate quickly (BoM, 2012). The proposed clearing is not likely to have an impact on surface water quality in the local area. The groundwater within the application area is between 500 - 1,000 milligrams per litre of Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. The proposed clearing of up to 30 hectares of native vegetation within an application area of 171 hectares is unlikely to have any impact on groundwater or surface water quality.

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

**Methodology** BoM (2012)  
GIS Database:  
- Hydrography, linear  
- Public Drinking Water Source Areas  
- RIWI Act, Groundwater Areas

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

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

With an average annual rainfall of 317.1 millimetres and an average annual evaporation rate of 3,600 - 4,000 millimetres there is likely to be little surface flow during normal seasonal rains (BoM, 2012). Whilst large rainfall events may result in the flooding of the area, the proposed clearing is not likely to lead to an increase in incidence or intensity of flooding.

The application area is located within the Ashburton catchment area. However, given the size of the area to be cleared in relation to the size of the catchment area (7,877,743 hectares), the proposed clearing is not likely to increase the potential for flooding within the application area, local area or within the catchment (GIS Database).

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

**Methodology** BoM (2012)  
GIS Database:  
- Hydrographic Catchments - Catchments  
- Hydrography, Linear

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

### Comments

There is one Native Title claim over the area under application (WC01/5). This claim was determined by the Federal Court on 29 November 2001. 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 is one registered Aboriginal Site of Significance within the application area (Site ID: 16955) (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 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 23 April 2012 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to the proposed clearing.

**Methodology** GIS Database:  
- Aboriginal Sites of Significance  
- Native Title Claims - Determined by the Federal Court

## 4. References

- BoM (2012) Climate Statistics for Australian Locations. A Search for Climate Statistics for Paraburdoo Aero, Australian Government Bureau of Meteorology, viewed 1 June 2012, <[http://reg.bom.gov.au/climate/averages/tables/cw\\_007185.shtml](http://reg.bom.gov.au/climate/averages/tables/cw_007185.shtml)>.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Pilbara 3 (PIL3 - Hamersley subregion) Department of Conservation and Land Management, Western Australia.
- CSIRO (2012) Australian Soil Resource Information System. Viewed 31 May 2012, <[http://www.asris.csiro.au/index\\_ie.html](http://www.asris.csiro.au/index_ie.html)>.
- DEC (2012) NatureMap - Mapping Western Australia Biodiversity, Department of Environment and Conservation, viewed 1 June 2012, <<http://naturemap.dec.wa.gov.au>>.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Government of Western Australia (2011); 2011 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). WA Department of Environment and Conservation, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Rio Tinto (2012) Flora and Vegetation Survey for Vivash Resource Evaluation Drilling and Access Tracks ? Native Vegetation Clearing Permit Support, March 2012.
- Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A & Hennig, P. (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.

