



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 4861/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Atlas Iron Limited

### 1.3. Property details

Property: Mining Lease 47/1449  
Miscellaneous Licence 45/248  
Local Government Area: Shire of East Pilbara  
Colloquial name: Mt Dove DSO Project

### 1.4. Application

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

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 17 May 2012

## 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 for the whole of Western Australia. One Beard vegetation association has been mapped within the application area (GIS Database).</p> <p>93: Hummock grasslands, shrub steppe; kanji over soft spinifex.</p> <p>A Level 2 flora and vegetation survey was undertaken over the Mt Dove area, including the application area, in June 2010 by botanists from Woodman Environmental Consulting Pty Ltd (Woodman). Five floristic community types (FCTs) from two super groups were described within the larger survey area, with one of the FCTs further divided into two subtypes (FCT 5a and FCT 5b) (Woodman, 2011). Each of the FCTs occurred within the application area, except FCT 5b, and these are described below (Woodman, 2011):</p> <p><u>Super Group 1</u></p> <p><b>FCT 1</b> - Mid Open to Sparse Shrubland of mixed <i>Acacia</i> species including <i>A. inaequilatera</i>, <i>A. colei</i> var. <i>colei</i> and <i>A. ancistrocarpa</i> over Low Open Shrubland dominated by <i>Acacia stellaticeps</i> over Low Hummock Grassland dominated by <i>Triodia epactia</i> and/or <i>T. lanigera</i> on red sandy loams on lower slopes, flats and plains.</p> <p><b>FCT 2</b> - Low Isolated Trees of <i>Corymbia zygophylla</i> or <i>Corymbia hamersleyana</i> over Mid Sparse Shrubland of mixed species including <i>Acacia ancistrocarpa</i>, <i>A.</i></p>	<p>Atlas Iron Limited has applied to clear up to 219 hectares of native vegetation for the purpose of mineral production. Clearing is to develop the Mt Dove Direct Shipping Ore (DSO) Project including an open pit mine, waste rock dumps, contractors' area, mine operations centre, accommodation camp and ROM pad facility.</p> <p>The application area is located approximately 60 kilometres south of Port Hedland.</p> <p>Vegetation will be cleared in accordance with Atlas Iron Limited's Ground Disturbance and Topsoil Management Standard Operating Procedure.</p>	<p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994);</p> <p>To:</p> <p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).</p>	<p>The vegetation condition was assessed by botanists from Woodman (2011).</p> <p>This project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act), due to the presence of EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' and required assessment under the EPBC Act with the level of assessment being set at Preliminary Documentation. Final approval for the project was given on 13 January 2012 and was subject to 12 conditions.</p>

*inaequilatera*, *A. sericophylla* and *A. acradenia* over Low Sparse Shrubland of mixed species including *Acacia stellaticeps*, *Pluchea tetranthera*, *Corchorus elachocarpus* and *Sida arenicola* over Low Hummock Grassland dominated by *Triodia lanigera* and/or *Triodia schinzii* on red sandy loams on lower slopes, flats and plains.

**FCT 3** - Low Sparse Shrubland of mixed species including *Pluchea tetranthera*, *P. ferdinandi-muelleri* and *Acacia stellaticeps* over Low Hummock Grassland of *Triodia lanigera* and *Triodia schinzii* on red sandy loams on lower slopes, flats and plains.

#### Super Group 2

**FCT 4** - Mid Sparse Shrubland of mixed species including *Acacia inaequilatera*, *Grevillea wickhamii*, *A. ancistrocarpa* and *A. acradenia* over Low Sparse Shrubland of mixed species including *Corchorus elachocarpus*, *Indigofera monophylla* and *Goodenia stobbsiana* over Low Hummock Grassland of *Triodia epactia*, *Triodia wiseana* or *Triodia lanigera* on shallow stony red-brown sandy loams on slopes and crests of low rises and hills.

**FCT 5a** - Low Sparse Shrubland of mixed species including *Ptilotus obovatus*, *Aerva javanica* and *Capparis spinosa* var. *nummularia* over Low Hummock Grassland of *Triodia epactia* and *Eriachne mucronata* on skeletal red sandy loams over massive ironstone outcropping on mid and upper slopes and crests of hills.

### 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 at variance to this Principle

The application area occurs within the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by plains supporting a shrub steppe of *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on the ranges (CALM, 2002).

A Level 2 flora and vegetation survey was undertaken over the Mt Dove area, including the application area, in June 2010 by Woodman Environmental Consulting Pty Ltd (Woodman). Five floristic community types (FCTs) from two super groups were described within the application area (Woodman, 2011). The FCTs that composed Supergroup 1 were generally widespread within the survey area while the FCTs of Supergroup 2 were locally more restricted as they were located on rocky, hilly areas (Woodman, 2011). The level of impact to FCTs 1, 2, 3 and 4 is considered to be low, with the impact to each of these FCTs being less than 25% of the total mapped area of each FCT in the local survey area (Woodman, 2011). However, there will be a high impact to FCT 5a, with approximately 66.7% of the extent of this subtype within the survey area to be impacted by the proposed clearing (Woodman, 2011). FCT 5a is considered to be the most locally significant FCT, as this subtype was only mapped in the summit and slopes of Mount Dove (Woodman, 2011). The level of impact to FCT 5a on a regional scale is difficult to determine as no regional Pilbara vegetation dataset is currently available. Woodman have undertaken an analysis of 831 vegetation quadrats in the Turner River Hub, including the quadrats established within the Mt Dove survey area, and Mt Dove FCT 5a can be considered part of Turner River Hub FCT 16 (Woodman, 2011). The extent of this FCT throughout the larger Turner River Hub study area is spatially relatively small (379 hectares, 0.6% of study area), however the FCT is geographically widespread throughout the Turner River Hub study area (Woodman, 2011). Therefore, FCT 5a is locally significant but may not be considered regionally significant.

A total of 88 discrete native vascular plant taxa were recorded within the Mt Dove survey area (Woodman, 2011). This compares with 122 vascular plant taxa recorded during the survey for the nearby Wodgina DSO Project (Outback Ecology, 2009 as cited in Woodman, 2011). The survey results indicate the Mt Dove survey area is relatively species poor; this is likely to be a function of the limited variety of topographical features and soil types, with the vast majority of the survey area consisting of broad floodplains with some minor rocky hills (Woodman, 2011). No major drainage features, which generally contain high vascular diversity, are present in

the survey area (Woodman, 2011). However, the relatively poor wet season prior to survey in 2010 may also have influenced the number of taxa recorded in the survey area; it is possible that some ephemeral taxa likely to occur in the survey area were not recorded because of lack of rainfall (Woodman, 2011).

No Threatened Flora, Threatened Ecological Communities or Priority Ecological Communities were recorded during the flora and vegetation survey or have previously been recorded within the application area (Woodman, 2011; GIS Database). One Priority 1 Flora species, *Heliotropium muticum*, was recorded during the survey but all the recorded locations were outside the application area (Woodman, 2011). No known locations will be directly impacted by the proposed clearing (Woodman, 2011).

Two introduced flora species were recorded from the application area, Buffel Grass (*Cenchrus ciliaris*) and Kapok (*Aerva javanica*) (Woodman, 2011). Both species were recorded on the summit of Mount Dove, with an estimated total of over 3,300 individual Kapok Bush plants on Mount Dove (Woodman, 2011). Atlas Iron Limited has developed and implemented a Ground Disturbance and Topsoil Management Standard Operating Procedure and a Vehicle Hygiene Standard Operating Procedure to limit the spread of weeds into the site (Atlas Iron Limited, 2012). Additional procedures for controlling Kapok Bush include carrying out a weed control program in the infested area prior to soil stripping, segregation of weed infested topsoil and conducting targeted and regular weed monitoring and eradication programs as necessary following clearing (Atlas Iron Limited, 2012). Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

A total of 92 vertebrate fauna species were recorded during the detailed autumn and spring 2010 fauna surveys over the Mt Dove area, which included the application area. The fauna comprised of 17 native mammal, six introduced mammal, 40 bird and 29 reptile species (Outback Ecology, 2011a). Based on findings of database searches and a comprehensive literature review, the vertebrate fauna assemblage recorded was as expected and found to be comparable with findings of similar sized surveys conducted within the surrounding region (Outback Ecology, 2011a).

The application area contains 'rocky ridge' fauna habitat on Mt Dove and this represents a naturally occurring isolated habitat island within the landscape (Outback Ecology, 2011a). Four conservation significant fauna species were recorded within this habitat type: Northern Quoll (*Dasyurus hallucatus*), Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*), Ghost Bat (*Macroderma gigas*) and Rainbow Bee-eater (*Merops ornatus*) (Outback Ecology, 2011a). This habitat is uncommon in the landscape and consequently, with the exception of the Rainbow Bee-eater, the proposed clearing is likely to impact on these conservation significant species at a localised scale (Outback Ecology, 2011a).

This project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' and required assessment under the EPBC Act with the level of assessment being set at Preliminary Documentation. Final approval for the project was given on 13 January 2012 and was subject to 12 conditions.

One of the environmental conditions attached to the approval is the preparation and implementation of a Significant Species Management Plan that maximises the ongoing protection and long term conservation of EPBC Act listed threatened fauna species. Other conditions include a 20 metre buffer around a significant cave and financial contributions to research into threatened fauna (DSEWPaC, 2012). The implementation of the conditions imposed by the DSEWPaC approval will minimise and mitigate the impact of the clearing on conservation significant fauna species and the landforms with which they are associated.

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

**Methodology** Atlas Iron Limited (2012)  
CALM (2002)  
DSEWPaC (2012)  
Outback Ecology (2011a)  
Woodman (2011)  
GIS Database:  
- IBRA WA (Regions - Subregions)  
- Threatened and Priority Flora  
- 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 at variance to this Principle**

A reconnaissance fauna survey and two detailed fauna surveys were undertaken by Outback Ecology which involved habitat mapping and a terrestrial vertebrate fauna assessment for the Mt Dove project (Coffey Environments, 2012). The detailed surveys were conducted in autumn and spring 2010 as Level 2 fauna surveys over the application area and its surrounds (Coffey Environments, 2012). An additional baseline Northern Quoll survey was conducted during May 2011 on and around Mt Dove (Outback Ecology, 2011a).

A total of four broad fauna habitats were identified over the survey area: Acacia shrubland on footslopes; Acacia, spinifex on sandplain; rocky ridge; and stony rise (Outback Ecology, 2011a). With the exception of the 'rocky ridge' habitat, the fauna habitats identified within the survey area are widely represented outside the survey area and throughout the Chichester sub-bioregion (Outback Ecology, 2011a). The 'rocky ridge' habitat associated with Mt Dove encompasses a total area of 22 hectares and represents a naturally occurring isolated habitat island within the landscape, with the nearest fauna habitat possessing similar characteristics (ironstone outcropping, caves, crevices and boulders) occurring 12 kilometres to the south (Outback Ecology, 2011a). This habitat type yielded the greatest diversity and abundance of conservation significant fauna species recorded from the spring and autumn 2010 surveys (Outback Ecology, 2011a).

Five conservation significant fauna species have been recorded within the Mt Dove study area, comprising:

- Northern Quoll (*Dasyurus hallucatus*) - listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Schedule 1 of the Western Australian *Wildlife Conservation Act 1950* (WC Act);
- Pilbara Leaf-nosed Bat (*Rhynonictis aurantia*) - listed as Vulnerable under the EPBC Act and Schedule 1 of the WC Act;
- Ghost Bat (*Macroderma gigas*) - listed as DEC Priority 4;
- Australian Bustard (*Ardeotis australis*) - listed as DEC Priority 4; and
- Rainbow Bee-eater (*Merops ornatus*) - listed as Migratory under the EPBC Act (Outback Ecology, 2011a).

Six inactive Western Pebble-mound Mouse (*Pseudomys chapmani*) (DEC Priority 4) mounds were recorded in the 'stony rise' habitat but each of the mounds were inactive at the time of the survey (Outback Ecology, 2011a).

The proposed clearing will directly impact approximately 64% of the significant 'rocky ridge' habitat occurring on Mt Dove (Outback Ecology, 2011a). Four conservation significant fauna species were recorded from this habitat. These species were the Northern Quoll, Pilbara Leaf-nosed Bat, Ghost Bat and Rainbow Bee-eater (Outback Ecology, 2011a). This habitat is uncommon in the landscape and consequently, with the exception of the Rainbow Bee-eater, the proposed clearing is likely to have an impact on these conservation significant species at a localised scale (Outback Ecology, 2011a).

#### Northern Quoll

A targeted Northern Quoll survey was undertaken by Outback Ecology where six systematic trapping sites on Mt Dove and its surrounds were established. The survey involved targeted trapping in May 2011 (Outback Ecology, 2011a). Potential Northern Quoll habitat was also targeted during the autumn and spring 2010 fauna surveys (Outback Ecology, 2011a).

A total of nine individuals were recorded during the autumn and spring 2010 surveys, comprising seven females and two males (Outback Ecology, 2011a). The vast majority of the captures were recorded within 'rocky ridge' habitat; specifically near caves, crevices and outcropping ironstone which are used by Northern Quolls for denning (Outback Ecology, 2011a). The remaining captures were recorded within 'Acacia shrubland on footslopes' habitat (Outback Ecology, 2011a). A total of seven individuals were recorded during the May 2011 targeted survey, with three animals being recaptures (Outback Ecology, 2011a). All but one capture of these individuals were in 'rocky ridge' habitat with a single capture of an adult male recorded within 'stony rise' habitat, approximately 1.5 kilometres south of Mt Dove (Outback Ecology, 2011a).

Given the survey results, Outback Ecology (2011a) suggests that Northern Quolls occur in a relatively high density at Mt Dove. Consequently, Mt Dove is likely to be an important refuge for the Northern Quoll, although it is unknown whether Mt Dove is an important ecological link between surrounding populations or is in itself an isolated, genetically distinct population (Outback Ecology, 2011a). The closest known populations of Northern Quolls outside the Mt Dove survey area are known from rocky ridges approximately 12 kilometres south of Mt Dove, Indee Station approximately 22 kilometres to the east and Wodgina approximately 35 kilometres south-east of Mt Dove (Outback Ecology, 2011a).

#### Pilbara Leaf-nosed Bat

Caves on Mt Dove with the potential to support Pilbara Leaf-nosed Bat were assessed during the autumn and spring 2010 surveys using AnaBat recordings, shotgun microphone recordings, remote camera photography and day time assessments of caves (Outback Ecology, 2011a).

Positive AnaBat echolocation recordings of the Pilbara Leaf-nosed Bat were recorded from two caves (cave sites MD-AN-2 and MD-AN-4) within the 'rocky ridge' habitat on Mt Dove; as well as from a stock water dam site outside of the application area, approximately 3.3 kilometres to the south of Mt Dove (Outback Ecology, 2011a). Cave site MD-AN-2 represented a large cave feature located on the northern face of Mt Dove. Calls were recorded from this cave during both the autumn and spring 2010 (Outback Ecology, 2011a). The call sequences were recorded in the middle of the night and this pattern is suggestive of an occasional visit by one or more individuals to this cave whilst foraging at night (Outback Ecology, 2011a). This species typically visits caves at night, possibly for resting, and may or may not roost in the structure during the day. This cave is likely

to be an important site for the species on Mt Dove (Outback Ecology, 2011a). Cave site MD-AN-4 is a small cave on the southern face of Mt Dove and one Pilbara Leaf-nosed Bat call sequence was recorded at the cave during the autumn survey (Outback Ecology, 2011a). This activity was considered to be low and is indicative of a short visit from an individual whilst foraging (Outback Ecology, 2011a). The cave is unlikely to be a significant roosting location for Pilbara Leaf-nosed Bats (Outback Ecology, 2011a).

#### Ghost Bat

Caves situated on Mt Dove were assessed for their suitability as roosts for the Ghost Bat using the same techniques listed above for the Pilbara Leaf-nosed Bat. Call sequences for Ghost Bat were recorded from cave site MD-AN-2 during both the autumn and spring 2010 surveys which suggests this cave is an important site for the species on Mt Dove (Outback Ecology, 2011a).

#### Australian Bustard

The Australian Bustard was recorded at several sites within and adjacent to the survey area during both the autumn and spring surveys (Outback Ecology, 2011a). It was recorded within the 'Acacia, spinifex on sandplain' habitat and the potential habitat loss from the proposed clearing is minimal (Outback Ecology, 2011a).

#### Rainbow Bee-eater

The Rainbow Bee-eater was widespread and common across the Mt Dove survey area during the autumn and spring 2010 surveys (Outback Ecology, 2011a). The Rainbow Bee-eater is a widespread species that occupies a variety of habitats and the impact on the species is expected to be negligible (Outback Ecology, 2011a).

#### Other Conservation Significant Fauna

A desktop analysis undertaken before the onground fauna surveys identified several other conservation significant fauna species which have the potential to occur in the survey area, however, the majority are unlikely to occur with the application area due to lack of suitable habitat (Outback Ecology, 2011a). Other potential conservation significant species are widespread, migratory or highly mobile and are likely to utilise the application area only intermittently (Outback Ecology, 2011a).

#### Short-range Endemic (SRE) Fauna

Phase 1 of a SRE invertebrate survey was conducted by Outback Ecology between March and May 2010 in accordance with EPA Guidance Statement No. 20 Sampling of Short Range Endemic Invertebrate Fauna for Invertebrate Fauna for Environmental Impact Assessment in Western Australia (Coffey Environments, 2012). Phase 1 resulted in the collection of eleven species and four of these were identified as putative SRE species. Two of these species, a new species of selenopid spider *Karaops* sp. nov. (Mt Dove) and the pseudoscorpion *Troglochernes* sp. nov. 001, were only collected from the application area (Coffey Environments, 2012). Phases 2 and 3 were targeted surveys to identify further specimens and populations of *Karaops* sp. nov. (Mt Dove) and *Troglochernes* sp. nov. 001. None of the specimens collected during these phases were identified as *Karaops* sp. nov. (Mt Dove) or *Troglochernes* sp. nov. 001 (Coffey Environments, 2012). Following the results of Phase 3, the DEC advised Atlas Iron Limited that a fourth phase was needed and recommended consultation with the WA Museum (Coffey Environments, 2012). Phase 4 involved experienced fauna specialists from both Outback Ecology and the WA Museum targeting the pseudoscorpion *Troglochernes* sp. nov. 001. Phase 4 had two components comprising targeted searching and baited leaf litter traps. The targeted searching component focussed on intensive searching of the two locations from which *Troglochernes* sp. nov. 001 had previously been collected. The baited leaf litter traps were deployed on Mt Dove and in similar habitats within the surrounding region (Outback Ecology, 2011b). None of the collected specimens were identified as *Troglochernes* sp. nov. 001, therefore it is not known if the species has a distribution outside of Mt Dove (Outback Ecology, 2011b).

Advice from the WA Museum (2011) suggested that *Troglochernes* sp. nov. 001 may occur in a highly specialised habitat and may only emerge onto the surface seasonally or during specific weather events. They may live commensally with an ant species, which would explain the sporadic collections, and sampling of ant nests was limited during the survey by the lack of access to the deep crevices amongst the bed-rock (WA Museum, 2011). Despite the results, it is very likely that *Troglochernes* sp. nov. 001 would not meet the criteria used to assess taxa to be included on Schedule 1 under the WC Act as the current lack of knowledge of its microhabitat would see it fail the survey criteria (WA Museum, 2011).

#### Troglofauna

Between April and September 2010, specialists from Subterranean Ecology Pty Ltd conducted a two-phase study to investigate the potential occurrence of troglofauna within the Mt Dove area (Coffey Environments, 2012). Two specimens of troglofauna belonging to a single species of the cockroach *Nocticola* were collected from banded ironstone habitat on Mt Dove. Genetic analysis demonstrated that these specimens belong to a lineage (*Nocticola* sp. n. lineage D) that is known to be widespread throughout the Pilbara region (Coffey Environments, 2012).

#### Stygofauna

A desktop assessment was conducted by Subterranean Ecology Pty Ltd to investigate the potential occurrence of stygofauna within the application area and the potential impact of the Mt Dove project (Coffey Environments, 2012). No stygofauna sampling has occurred in the application area (Coffey Environments, 2012). Based on nearby existing records and the geological characteristics of Mt Dove, the saturated calcrete and

alluvial/colluvial sediments were considered prospective stygofauna habitat (Coffey Environments, 2012). Management measures to limit the impact on stygofauna include mining only above the watertable and water abstraction will be short-term and limited to that required for the project (Coffey Environments, 2012).

#### DSEWPaC Approval

This project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the presence of EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' and required assessment under the EPBC Act with the level of assessment being set at Preliminary Documentation. Final approval for the project was given on 13 January 2012 and was subject to 12 conditions.

One of the environmental conditions attached to the approval is the preparation and implementation of a Significant Species Management Plan that maximises the ongoing protection and long term conservation of EPBC Act listed threatened fauna species. The plan must address:

- Measures to prevent fauna mortality during construction;
- Rehabilitation of the site;
- A commitment to install artificial Northern Quoll habitat outside of the disturbance footprint prior to the commencement of construction; and
- A fauna monitoring program (DSEWPaC, 2012).

A 20 metre buffer zone around Cave Site MD-AN-02 must be maintained to better protect the roosting habitat for the Pilbara Leaf-nosed Bat (DSEWPaC, 2012). Monitoring of the cave is required for the life of the mine and two years subsequent to mine closure (DSEWPaC, 2012). This cave was also used by the Ghost Bat and the buffer zone will better protect Ghost Bat roosting habitat.

#### Conclusion

Atlas Iron Limited consulted with DEC and DSEWPaC during the development of the project and the DSEWPaC assessment, and further consultation will occur during the finalising of the Significant Species Management Plan and the research contributions (Coffey Environments, 2012).

The 'rocky ridge' habitat in the application area does provide significant habitat for fauna indigenous to Western Australia, specifically conservation significant species. The implementation of the conditions imposed by the DSEWPaC approval will minimise and mitigate the impact of the clearing on conservation significant fauna species and the landforms with which they are associated.

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

**Methodology** Coffey Environments (2012)  
DSEWPaC (2012)  
Outback Ecology (2011a)  
Outback Ecology (2011b)  
WA Museum (2011)

#### **(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 known records of Threatened Flora within the application area (GIS Database). The nearest record of Threatened Flora is located approximately 150 kilometres south of the application area (GIS Database).

A flora and vegetation survey was conducted over the application area and its surrounds by Woodman botanists in June 2010 and no Threatened Flora were recorded (Woodman, 2011).

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

**Methodology** Woodman (2011)  
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 available databases revealed there are no known Threatened Ecological Communities (TECs) within the application area (GIS Database). The nearest recorded TEC, Themeda grasslands on cracking clays, is located 140 kilometres south-west of the application area (GIS Database).

No TECs were identified during the flora and vegetation survey conducted by Woodman botanists (Woodman, 2011).

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

**Methodology** Woodman (2011)  
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 clearing application area falls within the Pilbara Interim Biogeographic Regionalisation for Australia (IBRA) bioregion in which approximately 99.9% of the pre-European vegetation remains (see table) (Shepherd, 2009; GIS Database). This gives it a conservation status of "Least Concern" according to the Bioregional Conservation Status of Ecological Vegetation Classes (Department of Natural Resources and Environment, 2002).

The vegetation of the clearing application area has been broadly mapped as Beard vegetation association 93 "Hummock grasslands, shrub steppe; kanji over soft spinifex" (GIS Database). According to Shepherd (2009) approximately 100% of Beard vegetation association 93 remains at the state and bioregional level. This vegetation association would be given a conservation status of "Least Concern" at both a state and bioregional level (Department of Natural Resources and Environment, 2002).

The vegetation under application is not a remnant of 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	17,804,193	17,785,001	~99.9	Least Concern	6.3
Beard Veg Assoc. – State					
93	3,044,308	3,044,249	~100	Least Concern	0.4
Beard Veg Assoc. – Bioregion					
93	3,042,113	3,042,064	~100	Least Concern	0.4

\* Shepherd (2009)

\*\* 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 (2009)  
GIS Database:  
- IBRA WA (Regions - Sub Regions)  
- Pre-European Vegetation

**(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.**

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

There are no permanent or defined watercourses or wetlands within the application area (Woodman, 2011; GIS Database). The nearest defined watercourse is the Turner River, occurring on the eastern edge of the application area (Woodman, 2011; GIS Database).

Minor run-off lines occur on the slopes of Mt Dove, where water sheds from the feature during rainfall events. However, these are ephemeral and the vegetation of these areas is not different from the surrounding features (Woodman, 2011).

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

**Methodology** Woodman (2011)

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 datasets, the application area intersects the Mallina, Ruth and Uaroo Land Systems (GIS Database).

The Mallina Land System is characterised by extensive sandy surfaced alluvial plains, sometimes with patchy scalds; soft spinifex hummock grasslands with numerous shrubs (Payne and Tille, 1992). This land system is prone to wind erosion resulting in the formation of bare scalds and hummocks (Payne and Tille, 1992).

The Ruth Land System is characterised by hills and ridges of volcanic and other rocks supporting hard spinifex (occasionally soft spinifex) grasslands (Van Vreeswyk et al., 2004). This land system is not susceptible to erosion (Van Vreeswyk et al., 2004).

The Uaroo Land System is characterised by broad sandy plains supporting shrubby hard and soft spinifex grasslands (Van Vreeswyk et al., 2004). There is occasionally some erosion but generally the system is not susceptible to erosion (Van Vreeswyk et al., 2004).

As clearing will occur on the slopes of Mt Dove, land degradation may occur if appropriate rehabilitation techniques are not followed (Woodman, 2011). Atlas Iron Limited will implement the following management measures to minimise and control impacts to soil resources:

- Topsoil will be stripped and stockpiled to be used in rehabilitation;
- Topsoil stripping will not occur if conditions are wet;
- In areas of disturbed ground, erosion control structures (e.g. diversion drains, sediment traps, fencing) must be installed and maintained in good working order; and
- Redeployment of topsoils will occur at the end of the crushing and screening phase when disturbed areas to be rehabilitated become available (Atlas Iron Limited, 2010; Coffey Environments, 2012).

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

**Methodology** Atlas Iron Limited (2010)  
Coffey Environments (2012)  
Payne and Tille (1992)  
Van Vreeswyk et al. (2004)  
Woodman (2011)  
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 conservation area is Mungaroon Nature Reserve, which is located approximately 50 kilometres south-west of the application area (GIS Database). A large proportion of the vegetation in the Pilbara bioregion remains uncleared, approximately 99.9% (Shepherd, 2009), so it is unlikely the application area provides an important buffer or ecological linkage to the nature reserve.

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

**Methodology** Shepherd (2009)  
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 or defined watercourses or wetlands within the application area (Woodman, 2011; GIS Database). The nearest defined watercourse is the Turner River, occurring on the eastern edge of the application area (Woodman, 2011; GIS Database).

A significant amount of the water falling on the application area is likely to be lost to infiltration due to the high permeability of the sandy soils (Coffey Environments, 2012). Generally, light rainfall over extended periods will



produce small volumes of runoff due to initial soakage rates and evaporation. This runoff will be generally of low velocity and will have a minor sediment load. Heavier intense rainfall events usually produce higher velocity flow, resulting in naturally high sediment loads (Coffey Environments, 2012).

Land disturbance will increase the volume of sediment that could potentially be transported into the downstream environment after a significant rainfall event (Coffey Environments, 2012). Runoff and rainfall shedding off the waste rock dump and the ROM pad facility stockpiles has the potential to carry high sediment loads, though sedimentation ponds have been designed to collect runoff from these areas for all rainfall events up to and including a 1-in-5 year ARI event (Coffey Environments, 2012). Increased sedimentation in runoff during larger rainfall events is unlikely to be detectable due to the naturally high levels of sedimentation normally experienced in the Pilbara during such rainfall events (Coffey Environments, 2012).

Atlas Iron Limited propose to adopt the following management measures to minimise potential impacts to surface water:

- Storm water diversion structures will be constructed to divert 'clean' runoff around cleared areas where required;
- Surface water in contact with mining activities will be contained and directed to sedimentation ponds to settle out fines and contaminants before it is released into the environment;
- Rehabilitation of borrow pits will involve re-contouring to fit in with local drainage patterns as much as practicable;
- Routine monitoring of drainage structures for erosion will be undertaken to assess their stability, determine their effectiveness and trigger the implementation of remediation where required (Coffey Environments, 2012).

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 Yule River Water Reserve which is located approximately 6 kilometres north-west of the application area (GIS Database).

Groundwater within the application area is moderately fresh to brackish and at a predicted depth of 63 metres ADH (Coffey Environments, 2012). The watertable is approximately 30 metres below the base of the proposed open pit and mining will occur above the watertable (Coffey Environments, 2012).

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

**Methodology** Coffey Environments (2012)  
Woodman (2011)  
GIS Database:  
- Hydrography, Linear  
- Public Drinking Water Source Areas (PDWSAs)

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

**Comments** **Proposal is not likely to be at variance to this Principle**  
The application area is located within the Turner River catchment area (GIS Database). Given the size of the area to be cleared (219 hectares) in relation to the size of the catchment area (480,186 hectares) (GIS Database), the proposed clearing is not likely to increase the potential of flooding on a local or catchment scale.

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

**Methodology** GIS Database:  
- Hydrographic Catchments - Catchments

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

**Comments**  
There is one native title claim over the application area (WC99/3) (GIS Database). 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 is one registered Aboriginal Site of Significance (Site ID 30948) 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 the proponents' 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 Mt Dove Direct Shipping Ore Project was referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 16 February 2011, due to the presence of EPBC Act listed fauna species within the project area. The project was deemed a 'controlled action' and required assessment under the EPBC Act with the level of assessment being set at Preliminary Documentation. Final approval for the project was given on 13 January 2012 and was subject to 12 conditions.

The project was also referred to the Environmental Protection Authority (EPA). On 12 December 2011 the EPA deemed the project 'Not Assessed - Public Advice Given'.

The clearing permit application was advertised on 13 February 2012 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application.

**Methodology** GIS Database:  
- Aboriginal Sites of Significance  
- Native Title Claims - Registered with the NNTT

## 4. References

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- Outback Ecology (2011b) Targeted Survey for the Pseudoscorpion *Troglochernes* sp. nov. 001 (Phase 4). Unpublished Report Prepared by Outback Ecology Services for Atlas Iron Limited, November 2011.
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- WA Museum (2011) Correspondence Between the WA Museum and Atlas Iron Limited Re: *Troglochernes* sp. nov. 001. September 2011.
- Woodman (2011) Mount Dove Direct Shipping Ore Project Flora and Vegetation Studies. Unpublished Report Prepared by Woodman Environmental Consulting Pty Ltd for Atlas Iron Limited, July 2011.

## 5. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>CALM</b>	Department of Conservation and Land Management (now DEC), Western Australia
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DEC), Western Australia

<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia
<b>DoE</b>	Department of Environment (now DEC), Western Australia
<b>DoIR</b>	Department of Industry and Resources (now DMP), Western Australia
<b>DOLA</b>	Department of Land Administration, Western Australia
<b>DoW</b>	Department of Water
<b>EP Act</b>	Environmental Protection Act 1986, Western Australia
<b>EPBC Act</b>	Environmental Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI Act</b>	Rights in Water and Irrigation Act 1914, Western Australia
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia
<b>TEC</b>	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.