



## 1. Application details

### 1.1. Permit application details

Permit application No.: 521/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Lionore Australia (Wildara) NL

### 1.3. Property details

Property: M36/462  
M36/35  
M36/494  
M36/527  
M36/512  
M36/504  
M36/542  
M36/599  
M36/503  
M37/493  
M37/437  
L36/158  
L36/157

Local Government Area: Shire Of Leonora  
Colloquial name: Thunderbox Gold Project Mining Leases

### 1.4. Application

|                    |           |                    |                     |
|--------------------|-----------|--------------------|---------------------|
| Clearing Area (ha) | No. Trees | Method of Clearing | For the purpose of: |
| 77                 |           | Mechanical Removal | Mineral Production  |

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

| Vegetation Description   | Clearing Description   | Vegetation Condition   | Comment   |
|--|--|--|---|
| Beard Vegetation Association 18: Low Woodlands; mulga (Acacia aneura).   | The area under application occurs near the Thunderbox Gold Project, as a part of the Wildara Exploration Project. The Thunderbox Gold project is located 45km south of Leinster township, 70km north north-west of Leonora and 2km west of the Leonora Leinster (Kalgoorlie to Meekatharra) Road in the North-eastern Goldfields.    | Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery 1994) | Vegetation condition and description derived from supporting documentation accompanying application (TRIM No. IN20529). |
| Beard Vegetation Association 28: Open low woodland; mulga.   |  |  |   |
| Beard Vegetation Association 39: Shrublands; mulga scrub.  |  |  |   |
| Beard Vegetation Association 84: Hummock grasslands, open low tree & mallee steppe; marble gum & mallee (Eucalyptus youngiana) over hard spinifex (Triodia basedowii) between sandhills. | Paul Armstrong and Associates Consultant Botanist (Paul Armstrong et al) (2001, 2002 and 2004) advise that six vegetation associations were identified during the inspections of the area under application. Vegetation of the flats, uplands and drainage lines were all variations of the predominant mulga shrubland communities, |  |   |
| (Hopkins et al 2001,   |  |  |   |

Shepherd et al 2001) and are associated with sandy loams to loamy sands.

The next most common community was the sandplain, with vegetation of the spinifex sandplain and sand ridge associations, both occurring on red sands (Paul Armstrong et al 2001).

Of the 206 species collected during the site inspections, Paul Armstrong et al (2001) advise that 196 are mostly common and widespread throughout much of the arid portions of the state. There is a very low number of introduced weed species in the area under application (Paul Armstrong et al 2001).

The survey identified two locations in the area under application requiring management attention to ensure the conservation of their unique and rare ecological values. These areas are: the gully located to the east of the existing airstrip to plant access track, near the proposed village site, and the creek line on the 303000m East grid line (Paul Armstrong et al 2001).

### 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**

Paul Armstrong et al (2001, 2002, 2004) advise that no rare or unusual assemblages were identified in the area under application, and that all identified assemblages are common in the local area. The area under application has been subject to historic mining and pastoral activities and is therefore unlikely to have higher biodiversity values than the surrounding area.

The relief features of the area under application consist of irregular hills, ridges and plateaus, ranging to level and undulating sandplains, some having a gravel covering. This is not conducive to the topographical provision of a diversity of habitat functions. Edaphic variation in the area is limited to two soil types, which are widespread in the local area.

LionOre (2005) reports that locally uncommon patches of habitat are disproportionately significant in enhancing local biodiversity. The open eucalypt woodland over spinifex on sand of the proposed accommodation site, is therefore significant. LionOre (2005) advise that the development of the village will be undertaken with careful planning and strict supervision of the clearing and construction. To ensure minimal clearing of vegetation between buildings, individual Eucalypts have been mapped so that the building arrangement can be planned around them, resulting in less than 50% of vegetation cleared in the 3ha village footprint (LionOre 2005).

**Methodology**      LionOre correspondance (2005) (TRIM ref. EI2261)  
 Paul Armstrong et al (2001) (TRIM ref. IN20529)  
 Paul Armstrong et al (2002) (TRIM ref. IN20529)  
 Paul Armstrong et al (2004) (TRIM ref. IN20529)  
 GIS Databases:  
 - Topographical Contours, Statewide - DOLA 12/09/02  
 - Soils, Statewide - DA 11/99

**(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**

Biota (2004) and M.J & A.R Bamford, Consulting Ecologists (2001) advise that the area does not host any significant fauna.

M.J & A.R Bamford, Consulting Ecologists (2001) advises that the Wildara project area does not contain unusual habitats, and that the presence of introduced species has impacted considerably upon the fauna in the region. The resultant habitat degradation due to grazing pressure and direct predation has caused many sensitive species to now be extinct in the region (M.J & A.R Bamford, Consulting Ecologists 2001).

M.J & A.R Bamford, Consulting Ecologists (2001) advises that the area of the village comprises of a locally significant habitat. However, LionOre (2005) advise that the development of the village will be undertaken with careful planning and strict supervision of the clearing and construction. To ensure minimal clearing of vegetation between buildings, individual Eucalypts have been mapped so that the building arrangement can be planned around them, resulting in less than 50% of vegetation cleared in the 3ha village footprint (LionOre 2005).

Given that the vegetation communities under application are common and widespread, and the area to be cleared is of a relatively small scale (in relation to the vegetation community extent), it is not likely that the clearing as proposed is at variance with this Principle.

**Methodology** Biota (2004) (TRIM ref. IN20529)  
M.J & A.R Bamford, Consulting Ecologists (2001) (TRIM ref. ED518)  
LionOre (2005) (TRIM ref. EI2261)  
GIS Databases:  
- Soils, Statewide - DA 11/99  
- Pre-European Vegetation - DA 01/01

**(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**

No Declared Rare or significant flora were identified in any of the four floral surveys carried out by Paul Armstrong et al (2001, 2002 and 2004) in the area under application. However 14 Priority species were found in the local area (Paul Armstrong et al 2001). These comprise of four P1, one P2, seven P3, and two P4.

LionOre (2005) advise that no Priority plant species have been identified within the footprint of the proposed clearing. Notwithstanding, LionOre site policy requires the area to be surveyed for priority flora by the site Environmental Adviser prior to clearing.

**Methodology** Paul Armstrong et al (2001) (TRIM ref. IN20529)  
Paul Armstrong et al (2002) (TRIM ref. IN20529)  
Paul Armstrong et al (2004) (TRIM ref. IN20529)  
LionOre (2005) (TRIM ref. IN20529)  
GIS Databases:  
- Declared Rare and Priority Flora List - CALM 15/7/03  
- Clearing Regulations - Environmentally Sensitive Areas - DOE 8/03/05

**(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**

No threatened or significant ecological communities are recorded as occurring within the area under application. In addition all the surveys carried out by Paul Armstrong et al in the area under application from 2001 to 2004 (Paul Armstrong et al 2001, 2002 and 2004), report that all vegetation communities identified are common in the area and no rare or unusual plant assemblages were identified.

**Methodology** Paul Armstrong et al (2001) (TRIM ref. IN20529)  
Paul Armstrong et al (2002) (TRIM ref. IN20529)  
Paul Armstrong et al (2004) (TRIM ref. IN20529)  
GIS Databases:  
- Threatened Ecological Communities - CALM 15/7/03  
- Clearing Regulations - Environmentally Sensitive Areas - DOE 8/03/05

**(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 State Government is committed to the National Objectives and Targets for Biodiversity Conservation which includes a target that prevents clearance of ecological communities with an extent below 30% of that present pre-European settlement (Department of Natural Resources and Environment, 2002; EPA, 2000). The Beard vegetation complexes within this application are well above the recommended minimum of 30% (Shepherd et al 2001, Hopkins et al 2001).

| reserves/CALM-                              | Pre-European area (ha)   | Current extent (ha) | Remaining %* | Conservation Status** | % in managed land |
|---|--------------------------|---------------------|--------------|-----------------------|-------------------|
| IBRA Bioregion - Murchison Shire of Leonora | 28,206,195               | 28,206,195          | ~100         | Least concern         |                   |
| Beard vegetation association - 28           | No information available | 355,797             | 355,797      | ~100                  | Least concern     |
| Beard vegetation association - 39           | 8.2                      | 5,382,170           | 5,380,712    | ~100                  | Least concern     |
| Beard vegetation association - 84           | 13.5                     | 1,903,436           | 1,903,436    | ~100                  | Least concern     |
| Beard vegetation association - 18           | 2.0                      | 24,675,970          | 24,659,110   | ~99.9                 | Least concern     |

\* Shepherd et al. (2001)

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

\*\*\* Area within the Intensive Landuse Zone

**Methodology** Shepherd et al. (2001)  
Hopkins et al. (2001)  
Department of Natural Resources and Environment (2002)  
EPA (2000)  
GIS Databases:  
- Pre-European Vegetation - DA 01/01

**(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**

No wetlands occur in the area under application, and none of the watercourses traversing the area are identified as having significant environmental values. No wetland or groundwater dependant ecological communities are identified in the area under application. LionOre (2005) advise that no riparian vegetation will be cleared in the area under application. In addition, LionOre (2005) advise that there are no significant surface hydrological features near the project area.

**Methodology** LionOre correspondance (2005) (TRIM ref. EI2261)  
GIS Databases:  
- Soils, Statewide - DA 11/99  
- Topographic Contours, Statewide DOLA 12/09/02  
- Evaporation Isopleths - BOM 09/98.  
- Isohyets - BOM 09/98.

**(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**

Lionore (2005) advise that the Violet, Bevon, Bullimore, Sherwood and Jundee land systems occur within the area under application. These systems are comprised of a largely coarse-grained surface cover and, as such, it is unlikely that the clearing as proposed will increase wind erosion (Lionore 2005).

Due to the nature of the parent material, the biological indicators present and the predominantly high infiltration rate of the area under application, it is unlikely that the soils in the area under application will have a significantly high or low pH (Natti Hundi pers. comm. 2005)

Given the low annual rainfall (300mm) and the high annual evaporation rate (2400-2800mm) (BOM 2003), the clearing as proposed is unlikely to result in surface water erosion, waterlogging or salinisation.

**Methodology** Beureau of Meteorology (BOM), Commonwealth of Australia Website (2003)  
Lionore (2005) (TRIM ref. IN20529)  
GIS Databases:

- Soils, Statewide - DA 11/99
- Topographic Contours, Statewide DOLA 12/09/02
- Evaporation Isoleths - BOM 09/98.
- Isohyets - BOM 09/98.

**(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**

There are no records of conservation areas within 50km of the area under application. Thus the clearing as proposed is not likely to be at variance with this Principle.

**Methodology GIS Databases:**

- CALM Managed Lands and Waters - CALM 01/08/04
- System 1 to 5 and 7 to 12 Areas - DEP 06/95
- System 6 Conservation Reserves- DEP 06/95

**(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 area under application occurs in the Lake Carey and Raeside-Ponton Catchments in the Western Plateau Division of the Salt Lake Basin.

The area under application occurs in the Raeside and Lake Carey Groundwater Subareas in the Goldfields Groundwater Area. There is currently no record of groundwater-dependent ecosystems occurring within 1km of the area under application.

Given the low annual rainfall (300mm) and the high annual evaporation rate (2400-2800mm) (BOM 2003), the clearing as proposed is unlikely to significantly alter groundwater quality, or increase sedimentation, erosion, turbidity or eutrophication of surface waterbodies on or off site.

**Methodology Beureau of Meteorology (BOM), Commonwealth of Australia Website (2003)**

**GIS Databases:**

- Evaporation Isoleths - BOM 09/98
- Isohyets - BOM 09/98
- Groundwater Salinity, Statewide / 22/02/00
- Hydrography, Linear - DOE 01/02/04
- Hydrographic Catchments - Catchments - DOE 01/07/03
- Hydrographic Catchments - Basins - DOE 01/07/03
- Rainfall, Mean Annual - BOM 30/09/01
- EPP, Lakes - DEP 1/12/92
- Groundwater Subareas - WRC 10/10/08

**(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 area under application is characterised by a Mediterranean-Desert climate with a highly variable average rainfall of 300mm and an annual evaporation rate of approximately 2400 - 2800mm (BOM 2003). The proposal is not in a low-lying area and the proposed clearing is over a small area relative to the total catchment area.

It is not likely that the clearing as proposed will lead to a significant increase in peak flood height or duration.

**Methodology Beureau of Meteorology (BOM), Commonwealth of Australia Website (2003)**

**GIS Databases:**

- Rainfall, Mean Annual - BOM 30/09/01
- Evaporation Isoleths - BOM 09/98
- Hydrography, linear - DOE 01/02/04
- Hydrography, linear (Hierarchy) - DOE 13/04/05
- Topographic Contours, Statewide - DOLA 12/09/02

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

**Comments**

Two Aboriginal Sites of Significance are recorded as occurring in the area under application. The southern area is nominated on the interim register (the Warlawuru site) and the south eastern portion is on the permanent roster (the Katampul site), both of which are held under Section 38 of the State's Aboriginal Heritage Act 1972.

The area under application also occurs within the Wongatha (ref. WAG.6005\_98) and Wutha (ref. WAG.6064\_98) Native Title Claims. The area under application is held on a mining lease, and therefore the clearing is not considered to be a future act that affects Native Title.

The applicant, Lion Ore Australia (Wildara) NL is the holder of two licences (GWL1544272(2); and GWL158766(1)) to extract groundwater from the Combined- Fractured Rock West aquifer in the area under application. This extension of the Thunderbox Project will not require additional water allocation or alteration of the existing water allocation held by LionOre Australia (Wildara) NL in the area under application.

No Environmental Protection Licence or Works Approval will be required for operations and activities within the area under application.

**Methodology** GIS Databases:  
 - Native Title Claims - DLI 19/12/04  
 - Aboriginal Sites of Significance - DIA 04/07/02  
 - WRL, Properties, Groundwater - WRC (current) Properties

#### 4. Assessor's recommendations

| Purpose            | Method             | Applied area (ha)/ trees | Decision | Comment / recommendation   |
|--------------------|--------------------|--------------------------|----------|--|
| Mineral Production | Mechanical Removal | 77                       | Grant    | All the assessable criteria have been addressed and the proposal is not likely to be at variance to the Clearing Principles. Therefore the assessing officer recommends that the permit be granted.<br><br>In granting the Permit, the Department recognises LionOre's commitment to undertake absolute minimal clearing in the proposed village area, with the building arrangement planned around the existing trees insofar as is practicable. This area is identified as having high biodiversity and habitat value. |

#### 5. References

Armstrong, P. and Associates (2001) Rare Flora Search, Vegetation and Flora Survey on the Exploration and Mine Lease of Thunderbox - Supplementary Notes. Unpublished report prepared for LionOre Australia Limited, November 2002.

Armstrong, P. and Associates (2001) Rare Flora Search, Vegetation and Flora Survey on the Exploration and Mine Lease of Thunderbox. Unpublished report prepared for LionOre Australia Limited, February 2001.

Armstrong, P. and Associates (2002). Rare Flora Search, Vegetation and Flora Survey on the Exploration and Mine Lease of Thunderbox. Unpublished report prepared for LionOre Australia Limited, March 2002.

Armstrong, P. and Associates (2004) Project, Vegetation and Flora Survey of Proposed Pit C and Waste Dump Extension at Thunderbox. Unpublished report prepared for LionOre Australia Limited, March 2004.

Armstrong, P. and Associates (2004) Project, Vegetation and Flora Survey of Proposed Water Pipeline from Rogan Josh to the Thunderbox Operations. Unpublished report prepared for LionOre Australia Limited, March 2004.

Armstrong, P. and Associates (2004). Rare Flora Survey, Vegetation and Flora Survey on the at Rainbow and Mangilla Prospects. Unpublished report prepared for LionOre Australia Limited, November 2004.

Bamford, M. J. and Bamford, A. R. (2001) Vertebrate Fauna of the Wildara (Thunderbox) Project Area. Unpublished report prepared for Keith Lindbeck and Associates, March 2001.

BIOTA Environmental Sciences (2004) Waterloo and Amorac Extension Fauna Site Inspection. Unpublished report prepared for LionOre Australia Pty Ltd, September 2001.

Commonwealth of Australia Bureau of Meteorology (BOM) (2003) Australian Average Evaporation Map - Annual. Available Online: [http://www.bom.gov.au/climate/map/evaporation/evap\\_ann.shtml](http://www.bom.gov.au/climate/map/evaporation/evap_ann.shtml)

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.

EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority.

Hopkins, A.J.M., Beeston, G.R. and Harvey J.M. (2001) A database on the vegetation of Western Australia. Stage 1. CALMScience after J. S. Beard, late 1960's to early 1980's Vegetation Survey of Western Australia, UWA Press.

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

#### 6. Glossary

| Term | Meaning |
|------|---------|
|------|---------|

|      |  |
|------|--|
| CALM | Department of Conservation and Land Management   |
| DAWA | Department of Agriculture                        |
| DEP  | Department of Environmental Protection (now DoE) |
| DoE  | Department of Environment                        |
| DoIR | Department of Industry and Resources             |
| DRF  | Declared Rare Flora                              |
| EPP  | Environmental Protection Policy                  |
| GIS  | Geographical Information System                  |
| ha   | Hectare (10,000 square metres)                   |
| TEC  | Threatened Ecological Community                  |
| WRC  | Water and Rivers Commission (now DoE)            |