



# **Molyhil Tungsten - Molybdenum Project**

## **DRAFT VEGETATION CLEARING MANAGEMENT PLAN**

ENVIRONMENTAL MANAGEMENT PLAN PRODUCED TO  
ACCOMPANY MOLYHIL TUNGSTEN-MOLYBDENUM PROJECT  
PUBLIC ENVIRONMENTAL REPORT

June 2007

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## 1.0 INTRODUCTION

### 1.1 BACKGROUND

The Molyhil Tungsten-Molybdenum Project (Molyhil Project) is a proposed open cut mine and processing facility to be constructed in the Northern Territory. The main objective of the proposed facility is to produce scheelite and molybdenite concentrate for sale.

Thor Mining PLC (Thor) owns 100% of the Molyhil Project, which comprises EL 22349, totalling 829km<sup>2</sup> in area, and includes Mining Lease Application (MLA) 23825, which covers the deposit (former open pit, waste dumps and Run-of-Mine stockpile). In addition, Sunsphere Pty Ltd (a 100% owned subsidiary of Thor) has applied for MLA 24429 to further extend the mining operation and MLA 25721 to cover the project infrastructure requirements. The combined mining lease applications cover an area of 247 ha.

Approximately 300,000 tonnes of ore is expected to be treated annually at the mine, with an expected mine life of 4 years. Mining is planned to be undertaken by conventional truck and shovel operations.

### 1.2 LOCATION

The Molyhil deposit is located 240 km northeast of Alice Springs (320 km by road) at latitude 22° 45' S, longitude 135° 45' E, on the Huckitta (SF 53-11) 1:250 000 and Jinka (6052) 1:100 000 scale maps, Northern Territory (Figure 1). Molyhil is serviced via Alice Springs (population approximately 25 00), a modern city with full amenities and infrastructure.

The mine site is located on the Plenty Highway, approximately 25 km north from the turnoff to Jinka Station along a single lane unsealed road (Figure 1).

### 1.3 VEGETATION AND FLORA

#### 1.3.1 Vegetation

There are three habitats present within the mine lease: sand plain, alluvial riparian and rocky hill slope habitat. Heavy grazing of grasses, forbs and small shrubs in the understorey as well as clearing during previous mining activity, has resulted in much of the Molly Hill area being highly disturbed.

The dominant vegetation associations are open Gidgee (*Acacia georginae*) woodland over short grass and open Ironwood (*Acacia estrophiolata*) woodland over short grass. According to Perry et al. (1962), Gidgee communities are extensive in the north-eastern region around Jervis Station. "Sparse low tree" communities mostly characterised by *Acacia estrophiolata*, occur in a range of habitats and are a widespread community. Ground layer vegetation is mostly dominated by Buffel grass (introduced) and Bogan flea (associated with disturbed areas). In general, dominant species for the area are wide spread and their persistence is not dependent on the Molyhil area.

#### 1.3.2 Flora

The dominant vegetation includes *Acacia georginae* overstorey, *Senna* spp. shrubs, and heavily grazed *Cenchrus ciliaris* and *Calotis hispidula*. Riparian zones are dominated by *Eucalyptus camaldulensis* overstorey, *Acacia farnesiana* tall shrub layer and *Cenchrus ciliaris* and *Zygochloa paradoxa* in the ground layer.

A total of 95 flora species were recorded during 2004, 2006 and 2007 surveys.

A search of the EPBC Act (1999) website listed no threatened species known in the area. Likewise, none of the species identified are listed in the N.T. list of threatened species (Parks and Wildlife web site).

### **1.3.3 Weeds and Plant Disease**

Currently, Buffel Grass and to a lesser extent Ruby Dock are the main introduced species throughout the area.

## **1.4 FAUNA**

As the mine lease is situated on land that has been disturbed for many years if not decades, remaining animal populations are well adjusted to living in such an environment. Reptiles especially seemed adapted to the modified mine site environment with Long-nosed dragons (*Amphibolurus longirostris*) and Geckoes (*Gehyra variegata*) found in cast iron pipes and in an old septic tank. Mining activity is unlikely to make an impact on remnant populations.

As the mine lease is situated on land that has been disturbed for many years (if not decades), remaining animal populations are well adjusted to living in such an environment (e.g. Long-nosed dragons and Geckoes). Renewed mining activity is unlikely to have an impact on remnant populations.

A total of 84 species were recorded during the 2004, 2006 and 2007 fauna surveys undertaken at the project (Low Ecological Services, 2007).. This included 16 mammals (three were feral animals), 20 reptiles and 48 bird species.

No threatened species listed under the TPWC ACT or the NT Fauna Atlas records was recorded during the surveys or has been recorded from literature searches (Low Ecological Services, 2007).

One threatened species listed under the EPBC Act 1999, Rainbow Bee Eater (*Merops ornatus*) was recorded during the survey.

Two additional species listed under the EPBC Act (1999) could potentially occur in the area: Mulgara (*Dasycercus cristicauda*) and Black-footed Rock Wallaby (*Petrogale lateralis* MacDonnell Ranges race). Although no record of these species have occurred within the mine lease area, it would be expected that Black-footed Rock-Wallabies would have and may still occupy the nearby ranges.

No evidence of current occupation of either of these species was recorded during the surveys.

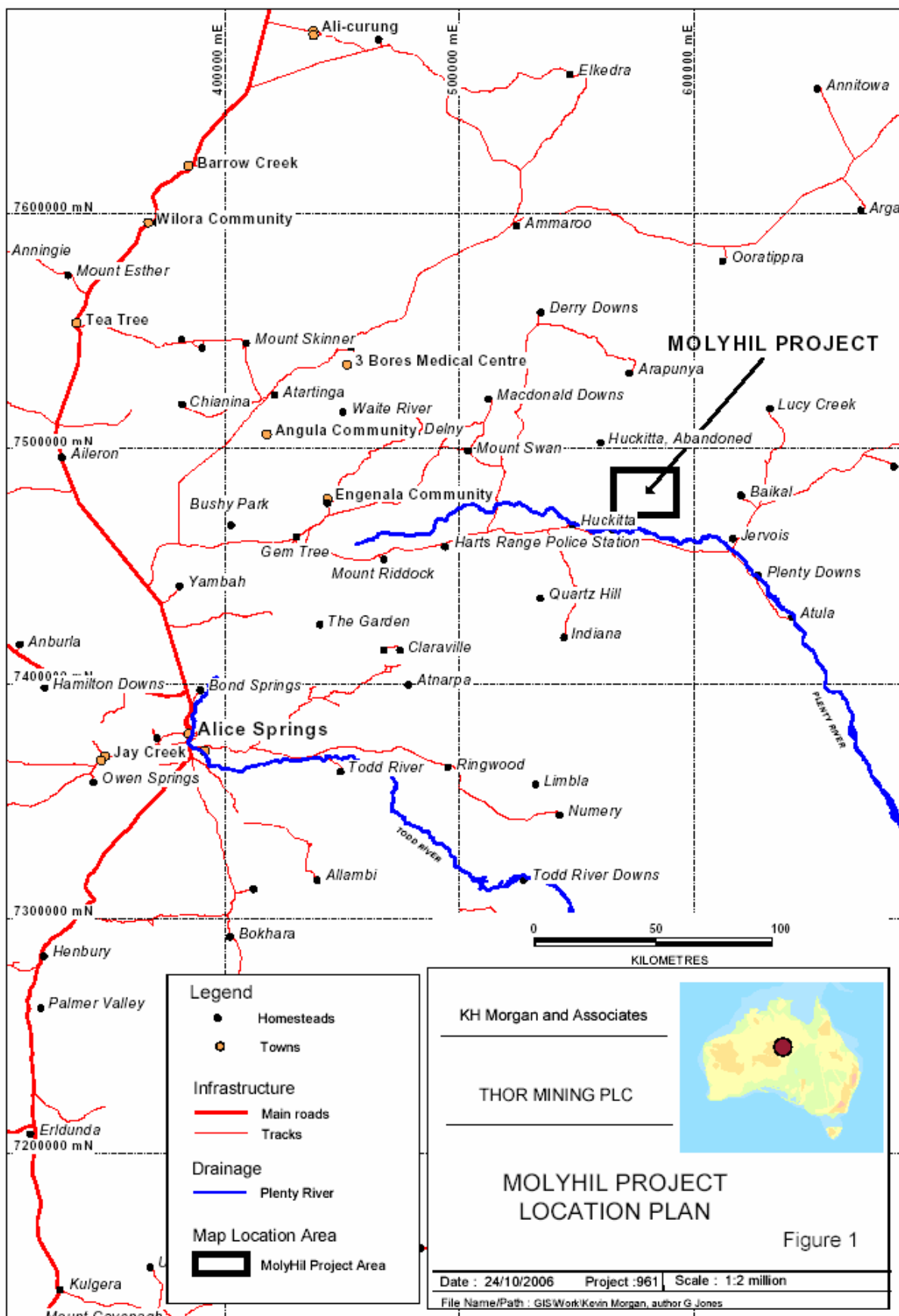


Figure 1 - Molyhil Project location map

## 1.5 OBJECTIVE

Thor will minimise the impact on vegetation during all phases of the Molyhil project through implementation of this management plan. This management plan applies to any undisturbed vegetation area on the site where land disturbance is planned to be undertaken.

Thor's project objectives for vegetation clearing are outlined in Table 1.

**Table 1 - Molyhil Project Objectives for vegetation clearing**

Objective	Target
Minimise clearing of native vegetation within approved area, with vegetation retained where possible.	Minimise land clearing
Disturbed areas will be progressively rehabilitated	100% of land available for rehabilitation is rehabilitated each year.
To prevent the introduction of invasive weed species into the project area, and to control any existing populations of weeds to prevent them from spreading.	100% of earthwork equipment entering the site is inspected and washed down.
Conduct activities to minimise impacts on flora and fauna species of conservation significance.	No disturbance of Declared Rare Flora and to avoid, minimise and mitigate any impacts to threatened flora.
Prevent contamination of land, minimise and remediate spills.	100% of key personnel trained to contain and clean up spills.
Prevent erosion (wind and water) on disturbed surfaces.	Zero significant erosion on disturbed sites.

## 2.0 RELEVANT LEGISLATION

Related Acts, Regulations and Standards relevant to the management of adverse impacts on vegetation, flora and fauna from all phase of Thor's Molyhil Project are listed below.

- *Mining Act 1980*
- *Territory Parks and Wildlife Conservation Act 2000*
- *Environment Protection and Biodiversity Conservation Act (EPBC)1999*
- *Soil Conservation and Land Utilization Act*
- *Planning Act*
- *Pastoral Land Act*
- *NT Environmental Assessment Act.*

### 3.0 ROLES AND RESPONSIBILITIES

Table 2 lists the roles and responsibility of the personnel responsible for the Weed Management Plan.

**Table 2 - Roles and responsibilities of Thor personnel**

Position	Responsibility
Resident Manager	<ul style="list-style-type: none"> <li>• Ensure appropriate resources are provided to implement the management and mitigation measures outlined in this document and associated procedures.</li> <li>• Ensure all land clearing within the Molyhil Project area is conducted in compliance with this Management Plan and other regulatory requirements.</li> </ul>
Occupational Health, Safety and Environmental Manager	<ul style="list-style-type: none"> <li>• Ensure measures contained in this Plan are implemented.</li> <li>• Ensure this Vegetation Management Plan is reviewed on an annual basis (including all procedures and registers referred to).</li> <li>• Ensure all employees are provided with the training and awareness required to fulfil their obligations under this Management Plan (e.g. inductions, noticeboards and procedure reviews).</li> <li>• Provide advice and assistance to all employees to ensure compliance with this Management Plan.</li> <li>• Schedule flora and fauna monitoring surveys, weed control spraying and progressive rehabilitation as per this and other Management Plans.</li> <li>• Compile disturbance data received from the Project Manager for the Annual Report.</li> </ul>
Project Manager	<ul style="list-style-type: none"> <li>• Ensure appropriate information and forms are supplied to the Environmental Manager when clearing is requested.</li> <li>• Provide supervision of all contractors undertaking clearing on behalf of Thor.</li> <li>• Liaise with the OHS&amp;E Manager to arrange audits.</li> <li>• Record all clearing and rehabilitation undertaken and communicate this to the OHS&amp;E Manager, and provide data for the Annual Report.</li> </ul>
All Staff and Contractors	<ul style="list-style-type: none"> <li>• Follow correct land clearance procedures (as outlined in this Management Plan).</li> <li>• Keep to existing tracks unless following advice from the Registered Manager or OHS&amp;E Manager.</li> <li>• Keep off rehabilitation areas.</li> <li>• Report any non-compliance with the Vegetation Management Plan to the OHS&amp;E Manager.</li> <li>• Provide assistance in implementing and maintaining impact minimisation programs when requested by the OHS&amp;E Manager</li> </ul>



## **4.0 POTENTIAL ENVIRONMENTAL IMPACTS**

### **4.1 VEGETATION AND FLORA**

Clearing within the mine site and haul road will involve the temporary or permanent loss of native vegetation, which may result in the loss of protected flora species, plant communities with limited knowledge of their distribution or threatened ecological communities.

### **4.2 WEEDS**

Activities associated with the project have the potential to cause:

- The introduction of weed species not already present in the project area.
- The spread of weed species that may already be present in the project area.

The first priority is to prevent weeds being brought into the area on vehicles and equipment. Once established, weeds can be extremely difficult to eradicate, as seeds of some species may persist in soil for fifty years or more. A separate Weed Environmental Management Plan for the project has been lodged concurrently with this report.

### **4.3 SOIL EROSION**

Once disturbed, soil binding by vegetation roots will be lost, and the potential for erosion by wind and water increases. Erosion can lead to the transport of nutrients, organic matter and plant seeds away from the affected area, making revegetation more difficult.

Areas most susceptible to soil erosion are those on higher landforms with steep slopes (exposed to wind and water) such as on waste rock stockpiles and embankments. Driving on tracks in wet conditions can cause deep wheel ruts that restrict overland flow of surface water during rainfall events and can channel water causing severe gully erosion.

### **4.4 SOIL COMPACTION**

The use of heavy machinery and constant vehicle traffic on access roads and tracks, and building of stable pads for construction of infrastructure cause soil compaction. Compaction of soil reduces the size and number of air spaces between soil particles. This results in a reduced water holding capacity of the soil, inhibition of plant root penetration and reduction of rainfall infiltration into the soil. This in turn affects the health and vigour of plants growing in the compacted soil.

### **4.5 FIRE**

Many of Australia's flora species are adapted to fire, and are dependent on fire for revegetation and survival. However, the situation changes when human activities modify the natural fire regime and fire-vulnerable floral communities instead become fire-prone. Increasing the fire regime has the potential to impact on the high environment through destruction of significant flora, destruction of fauna habitats, and exposure of burnt areas to wind and water erosion. Changes to the natural fire regime of an area can result in changes to vegetation seed setting, germination and health of plants as well as destroying fauna habitats.

The potential for fire may be increased as a result of mining activities such as hot work (welding etc) in uncleared areas. A Fire Management Plan has been developed and will be implemented concurrently with the Vegetation Clearing Management Plan.

## **5.0 MANAGEMENT STRATEGIES FOR NATIVE VEGETATION CLEARING**

Thor will implement the following measures during the project to minimise the impact on vegetation and maximise the conservation of the botanical and fauna values in the project area.

### **5.1 MINIMISATION OF LAND CLEARED**

Staff and contractors undertaking clearing activities shall be responsible for ensuring that only the minimum area required to safely perform the activity is cleared. They shall appropriately plan the work to ensure previously cleared areas such as access tracks, fence lines, and service corridors are used wherever possible.

The Project Manager shall be responsible for ensuring the area to be cleared is clearly marked in the field and defined on plans using GPS coordinates. Earthworks operators are informed that only the demarcated area proposed for clearing is disturbed.

Project Managers shall also plan land clearing such that only the area of land required for immediate use is cleared. Areas requiring land clearing in the future shall be left vegetated until such time as they will be used.

Based on these principals the following measures will be undertaken:

- Minimising the clearing profile;
- Before clearing commences, the areas to be cleared will be well-defined clearly marked so that over-clearing will be avoided.
- Clearing operators will be supervised.
- Existing access tracks and transport routes have been used where possible;
- Avoiding sites where the known rare flora exist;
- Protecting all vegetation outside of the clearing profile;
- Rehabilitating disturbed areas not required for ongoing maintenance;
- Cleaning down of machinery to reduce weed and disease introduction and spread;
- Induction of employees to ensure disturbance is confined to areas identified clearly in the field.
- Collect and correctly stockpile vegetative material and topsoil for later use at selected sites;
- Progressively rehabilitate completed areas as soon as practicable; and
- Only use local native plant species.

### **5.2 MISCELLANEOUS LAND DISTURBANCE**

Management strategies for other miscellaneous land disturbance include:

- Vehicles and machinery are to be parked in designated areas;
- Access to the site will be restricted to Thor personnel;
- Thor induction will prohibit personnel from access to the site other than for monitoring, mining and exploration purposes.

- Signage prohibiting access on the entry points will be erected and maintained.
- An environmental induction and awareness programme will be developed to raise the workforce awareness of conservation issues.
- Review other options for conserving the communities in the Thor lease areas.

### **5.3 REHABILITATION**

The objective of the rehabilitation program is to minimise erosion potential and ensure local native plant species are re-established. It is anticipated that the rehabilitation program will result in establishment of a self-sustaining vegetation complex into which local fauna will be able to return.

Rehabilitation undertaken over the project area will be guided by the following principles:

- Stockpile vegetative material and topsoil for later use;
- Rehabilitate completed areas as soon as practicable and where possible topsoil will be placed directly on nearby disturbed areas. If the latter is not practical then the length of topsoil stockpiling should be minimised wherever possible Seeding with local native plant species;
- Fence waste stockpiles to minimise grazing impact.

Local native (provenance) seed will be collected and used for all revegetation purposes at Molyhil. All hardstand or compacted areas or other disturbed areas no longer required will be deep ripped and direct seeded.

### **5.4 WEED MANAGEMENT**

Weeds will be controlled through prevention, monitoring and early eradication as follows:

- Avoiding or minimising disturbance to areas with, or vulnerable to, weed infestation where practicable;
- Inspecting vehicles and machinery for soil and seeds when entering the site and washing them in designated areas if required;
- Inspecting disturbed and rehabilitated areas for weeds (particularly after rainfall events) and consulting with the NRETA as to the treating of infested areas;
- Raising awareness of the workforce in weed control;
- Rehabilitating disturbed areas progressively to discourage weed establishment.

A separate Weed Management Plan has been developed for the Molyhil project.

### **5.5 FIRE MANAGEMENT**

Firebreaks around the Molyhil Project shall be regularly inspected and maintained to minimise the potential for ignition of native vegetation from mining activities. Fire management activities undertaken (e.g. fire break clearing) shall be recorded in the Land Clearing and Rehabilitation Register.

A Fire Management Plan has been developed and accompanies the PER.

## 6.0 PROCEDURES

### 6.1 SITE CLEARANCE PERMITS

Prior to any land clearing being undertaken, a 'Permit To Clear' form must be completed by the person initiating the clearing (the Project Manager), provided to the OHS&E Manager for comment and the Operations Manager for approval. A copy of the Permit to Clear form will be filed.

A copy of this form is attached as Appendix 1.

A construction map will be provided defining the envelope in which clearing and construction activities can occur. Clearing will be restricted to the minimum area required for construction works. No clearing beyond the boundary of the project area will be approved.

All land clearing on site will be approved with an internal permit using 'Thor Internal Land Clearing Approval' form prior to the commencement of earthworks. Each land clearing approval permit shall be authorised by the OHS&E Manager and the Operations Manager. The person requesting the Permit shall provide appropriate details on the permit of the location (including a map), purpose of clearing, date clearing is to be completed, area of clearing required, marked on a map with GPS coordinates of the boundary, (ensuring area required to stockpile vegetation and topsoil adjacent to the cleared area, if required, is included).

Conditions will be documented on the Permit by the OHS&E Manager. These can include requirements for the removal, stockpiling or re-use of topsoil and vegetation and clearing methodology for large areas (such as the open pit) using 'from the inside-out' techniques to maximise the opportunity of fauna to move away from the clearing activity. A copy of the permit and conditions shall be provided to the person requesting the clearing (the Project Manager). The Project Manager shall then be responsible for ensuring earthworks operators are informed of the conditions and comply with all requirements of the permit.

Should an excavation of land be required in a vegetated area, the Project Manager shall be responsible for submitting a Permit to Excavate along with the Permit to Clear or Disturb Land.

A detailed set of procedures for vegetation clearing will be developed by Thor prior to clearing activities.

## **7.0 TRAINING AND AWARENESS**

### **7.1 GENERAL SITE INDUCTION**

The following information shall be provided to all employees and contractors in the environmental component of the General Site Induction:

- The project's objectives and targets with respect to land, flora and fauna management;
- Requirements for all personnel to use existing tracks and roads and not to drive off road unless absolutely necessary;
- Description and location of any environmentally significant sites to be avoided by personnel (including information on Aboriginal heritage sites);
- Requirements for all earthworks equipment to be washed before arrival to site, and to be inspected and approved by the relevant Project Manager or Department Manager through the Weed Inspection Certificate process;
- Photographs of new weed species to be reported to the Environmental Manger for control;
- Species of conservation significance;
- Information on the impact of feral cats and other feral species on the environment, and the requirement for personnel not to interfere with any feral animal control program.

### **7.2 EARTHWORKS OPERATOR TRAINING**

The Project Manager or Department Manager shall be responsible for ensuring all operators of earthworks machinery are appropriately trained and certified/competent to use the particular piece of machinery. The Project Manager or Department Manager shall also ensure the earthworks operators are made aware of the conditions for clearing as outlined by the relevant Permit to Clear or Disturb Land, and are informed of the location and protection requirements for any environmentally significant sites located in the vicinity of their work area.

### **7.3 ENVIRONMENTAL MONITORING TRAINING**

Personnel required to undertake monitoring of rehabilitation or vegetation shall be provided with appropriate training from a person experienced in identifying flora within the Alice Springs region and rehabilitation/vegetation monitoring methodologies.

## 8.0 REFERENCES

Low Ecological Services (2007). *Landscape, Flora and Fauna Survey and Assessment of Molyhil Tungsten Molybdenum Project within ML(A) 23825*. Unpublished report prepared for Thor Mining PLC, May 2007.

Perry, R.A., Mabbutt, J.A., Litchfield, W.H. and Quinlan, T. (1962) Land Systems of the Alice Springs Area, Northern Territory, Australia. CSIRO, Canberra.

Slyter, R.O. (1962) Climate of the Alice Springs Area. Part III in Perry et al. 1962. q.v.

## **APPENDIX 1 – CLEARING PERMIT FORM**



	<b>MOLYHIL PROJECT CLEARING PERMIT</b>	Document No: Document Owner: OHS&E Manager Revision No: Issue Date: Page:
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This form must be completed and forwarded to the Environment Department a minimum of 5 days prior to commencing works.

**SECTION 1: TYPE OF DISTURBANCE**

APPROVAL IS REQUESTED FOR (tick all appropriate boxes):

VEGETATION CLEARING     
  TOPSOIL CLEARING     
  DRILLING

OTHER GROUND DISTURBANCE (PLEASE SPECIFY):

PURPOSE OF GROUND DISTURBANCE:

**SECTION 2: LOCATION OF DISTURBANCE**

MINE AREA OR NAME: \_\_\_\_\_ LEASE NO(S): \_\_\_\_\_

SPECIFIC LOCATION DETAILS:

PROPOSED DISTURBANCE AREA (ha):  
(include table if more than one tenement)

IS THE DISTURBANCE ON A PREVIOUSLY DISTURBED AREA:       YES       NO

IS VEGETATION & GROWTH MEDIUM TO BE STOCKPILED:     
 TOPSOIL       YES       NO  
 VEGETATION       YES       NO

Disturbance area & location of proposed vegetation and topsoil stockpiles are included on the attached:     
 AERIAL PHOTOGRAPH       DRAWING

**SECTION 3: DESCRIPTION OF WORKS**

DETAIL THE DISTURBANCE ACTIVITY & ENVIRONMENTAL CONTROLS (IF APPLICABLE):

PROPOSED COMMENCEMENT DATE:

**SECTION 4: RESPONSIBLE PERSON**

COMPANY UNDERTAKING THE SURFACE DISTURBANCE:

PERSON SUPERVISING THE SURFACE DISTURBANCE:

SUBMITTED BY (Name): \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

**SECTION 5: ENVIRONMENT DEPARTMENT CLEARANCE**

HABITAT / FAUNA SURVEY CHECK     
  RARE FLORA/ VEGETATION SURVEY CHECK     
  HERITAGE SITE CLEARANCE     
  MONITORING POINT CHECK

APPROVED BY (Name): \_\_\_\_\_ SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

**SECTION 6: ENVIRONMENT DEPARTMENT CONDITIONS OF APPROVAL**