

# PEST & WEED MANAGEMENT PLAN

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Molyhil Tungsten Molybdenum Mine

## Document Control

Date	Change	Author	Reviewer
August 2015	First Draft	RSB	

# 1. INTRODUCTION

This document forms part of the Thor Mining PLC Environmental Management System for The Molyhil Mine Project.

## 1.1. Purpose

The purpose of this weed management plan is to:

- ensure that Thor’s activities do not lead to the introduction or spread of weeds;
- through regular monitoring identify any weed establishment that may result; and
- eradicate where possible or control any identified weed infestations.

## 1.2. Scope

This plan applies to;

- To all people working at the site including staff, contractors consultants and transport operators.
- To all areas of the mining licence, access corridors to the mining lease.
- For the duration of the project, and of the mineral licence including post closure monitoring.

## 1.3. Objectives

### 1.3.1. Overall Objectives

Compliance with the Northern Territory *Weed Management Act*; and thereby protect and promote native vegetation assemblages endemic to the project area from competition by weed infestation.

### 1.3.2. Specific Objectives and Targets

	Objective	Target
1	No weeds introduced	100% compliance
2	Existing weeds eradicated	100% compliance
3		

## 1.4. Roles & Responsibilities

Position	Responsibility
Resident Manager / Project Construction 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 compliance with this Management Plan and other</li></ul>

	regulatory requirements.
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 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 relevant activities as per this and other Management Plans.</li> <li>• Implement monitoring programs as per this plan.</li> <li>• Compile relevant data to meet reporting requirements.</li> </ul>
All Other Managers, Staff and Contractors	<ul style="list-style-type: none"> <li>• Comply with the provisions of this Management Plan</li> <li>• Assist and co-operate where relevant with the implementation of this Management Plan including any associated monitoring, maintenance and reporting requirements.</li> <li>• Report any non-compliance with this Management Plan to the OHS&amp;E Manager.</li> </ul>

### 1.5. Potential Impacts

Weed infestation and subsequent degradation of native vegetation assemblages.

### 1.6. Background Information

#### Northern Territory Weeds Management Act

All Land within the Northern Territory is subject to the Northern Territory Weeds Management Act. Under the Act the land owner and occupier must take all reasonable measures to prevent the land being infested with a declared weed and prevent a declared weed or potential weed on the land spreading to other land.

#### Weeds Presently in the Molyhil Area

Currently, Buffel Grass (Plate 2) and to a lesser extent Ruby Dock (Plate 1) are the main introduced species throughout the area. Ruby Dock is to be controlled where possible and is not to be spread. Buffel Grass is an introduced pastoral plant and is not classed as a weed. It is Thor's responsibility to rehabilitate their site in a responsible way using native species to assist with maintenance of natural bio-diversity. While Thor will not use Buffel grass seeds for revegetation of the mine site, Given the extensive establishment of Buffel Grass in the area, it is likely that Buffel will invade the site fairly quickly, as it has done at the old TSF area rehabilitated in 1999 where it is now the dominant grass.



**Plate 1: Ruby Dock**



**Plate 2: Buffel Grass**

### Potential Infestation Weeds Species

The following three weeds are potentially capable of invading the Molyhil Area as advised by Weeds Branch. A fourth species, Mexican Poppy (Plate 3), could potentially invade the water courses of the area if river sand from the area around Alice Springs is brought to site. No sand from the main sandy



**Plate 3: Mexican Poppy**

river beds around Alice Springs should be brought on to site.

Rubber bush (Plate 4) is declared a Class B (spread to be controlled – south of 16°30'S latitude) and Class C (not to be introduced to the Northern Territory) weed in accordance with the NT *Weeds Management Act*.

Rubber bush is native to tropical Africa and Asia. It was probably introduced to Australia as a garden plant, or in the packaging of camel saddles brought from India in the early 1900s. Rubber bush first became established in the Katherine area and then spread along the Roper River in the early 1950s. Rubber bush has now spread into Western Australia and through the Barkly Tablelands to Tennant Creek.

Rubber bush poses a significant risk to valuable grazing land in the NT. It has the potential to colonise large parts of the Barkly Tablelands and Victoria River District, where it competes with native pastures.

The plant contains several toxic compounds and may be poisonous to humans and stock. Dense thickets of rubber bush can form on disturbed and degraded soils, inhibiting access to watering points, bores and dams.



**Plate 4: Rubber bush (Class B & C weed)**



**Plate 5: Parkinsonia (Class B & C weed)**

Parkinsonia (Plate 5) is declared a Class B (growth and spread to be controlled) and Class C (not to be introduced to the Northern Territory) in accordance with the NT [Weeds Management Act](#). Parkinsonia is also a [Weed of National Significance](#).

Parkinsonia is native to southern USA, the Caribbean, and Mexico. It is suggested that Parkinsonia was first introduced into Australia in the late nineteenth century as a shade tree for planting around water bores, dams and homesteads. It is now found in established thickets throughout semi-arid Australia with infestations in Western Australia, the NT, Queensland and northern New South Wales. Parkinsonia is now well established on the Barkly Tableland, Victoria River and Gulf regions and occurs in various densities across most of the NT.

Parkinsonia can form dense, impenetrable thickets, sometimes several kilometres across, making areas of land inaccessible to humans and animals. The thickets can impede mustering activity, restrict stock access to water, displace native plants and animals, alter stream flows and harbour feral animals, particularly pigs.

Noogoora burr (

Plate 6 & Plate 7) is declared a Class B (spread to be controlled) and Class C (not to be introduced to the Northern Territory) weed in accordance with the NT [Weeds Management Act](#).

Noogoora burr is a native of the Americas; it was introduced to Queensland late last century in imported cotton seed. Since then it has become a problem in Queensland, parts of New South Wales, South Australia, Western Australia and in the NT. Once established, noogoora burr is difficult to eradicate and spreads rapidly. In the NT it is now established on many major river systems, including the Calvert, Daly, Mainoru, MacArthur, Victoria and West Baines. Noogoora burr is also established on properties in the Barkly, Gulf, Katherine, Victoria River and Darwin districts.

Noogoora burr can rapidly invade riparian and seasonally wet areas, as well as grazing and cropping land. Noogoora burr can significantly impact production, as it can displace valuable grazing species, and is highly toxic if ingested by cattle, sheep and horses. Symptoms of stock poisoning include intense pain, salivation, muscular spasms, tremors, vomiting and scouring. Death can occur within two hours or up to two days after ingestion. The burrs themselves can also become problematic as they can become entangled in the hair of livestock. Costs for inspection and removal of burrs from travelling livestock can dramatically increase in affected areas.



Plate 6: Noogoora burr (Class B & C weed)



**Plate 7: Noogoora burr (Class B & C weed)**

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.

Northern Territory Threatened species list. Northern Territory Parks and Wildlife Website:

<http://www.nt.gov.au/nreta/wildlife/threatened/specieslist.html#plants>

NT Government, Weed Management on Mine Sites, Advisory Note.

NT Government (2014): Northern Territory Weed Management Handbook

### **1.7. Management & Mitigation Strategies**

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 DNRETA as to the treating of infested areas;
- Raising awareness of the workforce in weed control;
- Rehabilitating disturbed areas progressively to discourage weed establishment;
- If any landscaping is carried out at offices, camp and other buildings, ensure no exotic species are introduced or used.

## **1.8. Procedures**

### **Weed Hygiene Procedure**

The most effective way of preventing the introduction and spread of weeds into an area is to ensure that all mobile equipment (especially earthmoving equipment), regardless of size and design, is free of all vegetative and soil matter prior to arrival. A weed hygiene program will be implemented as shown in Table 2.

All mobile equipment shall be washed down and clean of mud, earth and vegetable matter prior to entry to site. It is the responsibility of the Contract Manager or Department Manager to instruct all earthworks contractors of the requirement to thoroughly wash their equipment prior to mobilisation.

The Contract Manager or the Department Manager is also responsible for ensuring all earthworks equipment is inspected prior to commencement of work to ensure they have been adequately washed down.

A wash down area, with drainage water directed to a dedicated sump, will be located near the office area. All vehicles requiring entry to the site will be required to wash down before proceeding onto the site. Sumps will be managed to ensure that they do not overflow during high rainfall events and discharge seed stock and hydrocarbon contamination into the surrounding environment. Purpose built washdown bay facilities will feature a silt trap/sump that can easily be "bogged out", and an oil/water separator if practicable.

As per the Weed Management Act, spread of potential weed contamination off of the site is also prohibited and thus weed hygiene is also applicable to vehicles or equipment leaving the site.

**Table 1: Weed Hygiene Program**

<b>WEED HYGIENE PROGRAM</b>		Program No. 1	
OBJECTIVE: Prevent the introduction and spread of weeds by equipment			
TARGET: No vehicles or machinery will commence work on or leave the site whilst potentially contaminated by weeds			
Target Date: from project commencement	Accountable: Environmental Manager	Approved: Project / Resident Manager	
Action Required:	Other Resources:	Action by:	Date:
1. All contracts to specify vehicles and equipment mobilised to site must be clean from soil and vegetable matter.		Project / Resident Manager	Prior to mobilisation
2. Establish vehicle washdown facility at site with contaminated water containment.		Project Manager	At commencement of site works
3. All vehicles and equipment arriving at site must upon arrival, and before entry to the work area, be inspected for remnant soil and vegetable matter and undergo wash down if contamination is found.		Area Managers	On-going
3. Restriction of vehicular access to designated tracks.		All operators	On-going
Key Performance Indicators (KPIs):			
<ul style="list-style-type: none"> <li>• Nil weed infestation due to vehicles or equipment entering the site.</li> <li>• No weed contaminated vehicles leaving site.</li> </ul>			

**Invasive Species Register**

A Weed Identification program as shown in Table 2 will be implemented

The project area will be regularly inspected for invasive species by the OHS&E Manager or their delegate. Locations of any weed populations shall be recorded in a designated Weed Control Register. The following information will be recorded:

- Location and extent of the area infected (mapped in MGA coordinates);
- Species type (if known)
- General topography of the infected area (ie. drainage, disturbed areas etc).

The OHS&E Manager will organise:

- That the impacted area is demarcated to ensure that no person or mobile equipment enters the area;
- Weed eradication as per the subsequent procedure;
- The post application inspection and the photographic monitoring to assess the success of the eradication program;

Photographs of weed species known to be problematic in the area will be posted on noticeboards such that all employees may be able to identify any populations around their work areas and report them to the OHS&E Manager. The site induction will include information and photographs of weeds

both known and likely to infest the area. This ensures all personnel on site are aware of weed species and assist with their control.

**Table 2 - Weed identification program**

<b>WEED IDENTIFICATION PROGRAM</b>		Program No. 2	
OBJECTIVE: Early identify of any weed infestation.			
TARGET: Any areas of weed infestation are identified for appropriate control and mitigation response.			
Target Date: from project commencement	Accountable: Environmental Manager	Approved: Project / Resident Manager	
Action Required:		Action by:	Date:
1. Identification of weed infestations of areas susceptible to infestation adjacent to or within the proposed disturbance area.		Environmental Manager	Prior to construction
2. Conduct inspections during construction and operation to identify potential weed establishment.		Environmental Manager	On-going
3. Instruct personnel to identify and report known and likely weeds that could occur in the area to the Environmental Manager.		Environmental Manager	On-going
5. In the event that a particular weed species infestation is identified, targeted management measures will be developed and implemented in reference to the NT Department of Natural Resources, weed management guidelines.		Environmental Manager	On-going
6. Report on potential weed establishment in environmental reporting		Environmental Manager	On-going
Key Performance Indicators (KPIs):			
<ul style="list-style-type: none"> <li>• Effective weed identification</li> <li>• Weed infestations mapped for control and monitoring</li> </ul>			

**Weed Eradication Procedure**

The OHS&E Manager will prepare a manual for chemical control programs wherever new weed species are identified on the Molyhil Project and access tracks, roads, and service corridors. Advice on the most effective control means for each weed species shall be sought from the DLRM.

The most likely locations of weed introduction on site include the wash down bay and sediment sump, visitor parking area and stores/laydown yards. Routine spraying these areas will be undertaken to eradicate all germinating plants, prior to seed set, to ensure any weeds are eradicated from site.

All weed control activities shall be recorded in a Weed Control Register, including the weed species, location, date and the type of control methods used.

A Weed Control program is shown in

Table 3.

**Table 3 - Weed Control Program**

WEED CONTROL PROGRAM		Program No. 3	
OBJECTIVE: Control potential outbreaks of noxious weeds			
TARGET: Prevent further outbreak and spread of weed species			
Target Date:	Accountable: Resident Manager	Approved:	
Action Required:		Action by:	Date:
1. Identify suitable control methods for individual species. Approved control mechanisms.		Resident Manager	On-going
2. Implement control measures for emergent populations prior to seed set.		Resident Manager	On-going
3. Liaison with Department of Natural Resources, Environment and Heritage regarding weed control activities		Resident Manager	On-going
4. Ensure seed collected for use in rehabilitation is free of weeds.		Resident Manager	On-going
Key Performance Indicators (KPIs)			
<ul style="list-style-type: none"> <li>• Weed establishment does not spread to surrounding areas.</li> <li>• Control of potential weed infestations.</li> </ul>			

## 1.9. Training & Awareness

### 1.9.1. General Site Induction

The following information will be provided to all employees and contractors as part of the General Site Induction before they are permitted to work on the site.

- This management plan and in particular;
  - Weed species identification.
  - Section 1.7 – Management & Mitigation Strategies to which they must abide.
  - All employees obligation to observe and report any weed occurrence.
- The vehicle hygiene procedure.

It will be necessary for inductees to demonstrate they have understood the contents of the induction.

### 1.9.2. Specific Operator Training

None specified

### 1.9.3. Monitoring Training

None specified

## 1.10. Monitoring & Measurement

Daily observation

Annual environmental monitoring

Post closure pest and weed monitoring is described in the monitoring section of the Rehabilitation & Closure Plan (Appendix 4n).

**1.11. Review of Plan Effectiveness**

Annually

**1.12. Strategies to Amend Non-Conformance**

Review and amend procedures as required.