



**MITHRIL**  
**RESOURCES LTD**

# ENVIRONMENTAL MANAGEMENT PLAN



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## 1. INTRODUCTION

Mithril Resources Ltd explores for base metal and gold mineralisation throughout the whole of Australia, has a dedicated exploration team based in Adelaide, South Australia and currently has projects in the Northern Territory and Western Australia. Mithril's Environmental Management Plan provides a framework to implement Mithril's Environmental Policy.

Carefully managed exploration has little or no lasting impact on the environment and Mithril has formed a best practice policy for the management of its exploration programs.

Mithril's exploration programs are designed to have little or no impact on the environment. The Company achieves this through a commitment to environmental planning and management to produce exploration programs that:

- **avoid or minimize disturbance and contamination within exploration areas;**
- **consult affected communities in developing work programs and determining outcomes;**
- **protect the environment outside exploration areas; and**
- **restore areas after exploration.**

Adverse impacts can be minimized or eliminated by employing accepted environmental best practices in our exploration activities. Examples include:

- **minimizing clearing of local vegetation prior to exploration activities;**
- **implementing adequate controls on fuel or fluids used in drilling;**
- **capping and making safe drill holes;**
- **making safe trenches (costeans) dug to sample soil layers;**
- **constructing only the minimum number of access tracks; and**
- **eliminating the transport of weeds or other exotic species and plant diseases between regions by implementing good housing keeping practices and keeping equipment and vehicles clean.**

Mithril recognizes the significant environmental knowledge of local people in planning and carrying out an exploration program and will consult local stakeholders on the environment when implementing an exploration program. The company specifically recognizes the knowledge within Aboriginal communities that may assist in avoiding or minimizing local and regional environmental impacts of exploration. As such, the Company welcomes community involvement from the beginning and throughout an exploration program.



When active in an area, Mithril shares responsibility for protecting all aspects of the local and wider environment, for the present and for the future. The basis of our environmental actions is documented in our Environmental Policy as follows.

The Company will:

- **strive to protect the natural and social environments within which exploration is to be conducted;**
- **respect the rights, cultural beliefs and relevant concerns of all parties having a legitimate interest in land proposed for exploration;**
- **comply with all statutory requirements in force in all countries and states where exploration is occurring;**
- **minimize the impacts of exploration wherever possible, consistent with industry standards and best practices;**
- **apply the best practical methods known and available to the company during mineral exploration;**
- **consult with all stakeholders prior to, during and after exploration programs and encourage two-way communication;**
- **rehabilitate land affected by its mineral exploration with the goal of returning it to its pre-exploration condition;**
- **monitor exploration impacts, with a view to develop and implement methods of least ground disturbance;**
- **monitor rehabilitation to ensure its long term success, and**
- **train and assist its employees to achieve the above environmental goals.**

## 1.1 Policy and Responsibilities

Mithril Resources has an Environmental Policy, specific objectives and a chain of command with clear responsibilities for people within the organisation. The organisational responsibility hierarchy is as outlined below.

Level within organisation	Responsibilities
<b>Responsible Officer</b>	Is responsible to ensure that the organisation meets its obligations to provide a healthy and safe workplace as required by the NT Workplace Health and Safety Act 2007 and the implementation of Mithril's Health, Safety and Welfare policies and programs.
<b>Managers</b>	Managers plan schedule and control all work and must ensure that appropriate measures are implemented to control risks to health, safety and the environment
<b>Supervisor – Senior Geologists</b>	Supervisors control of the day to day work in the field. They must ensure that work is done in accordance with any existing health, safety and the environmental procedures and in a manner which controls the risks to health safety and the environment.
<b>Employees</b>	Employees are required to complete their work in a manner that does not put themselves, others or the environment at risk. They are to follow reasonable instructions and use any training, personal protective equipment or tools provided with regard to health, safety or the environment.

### The Responsible Officer

- Is the person responsible for the health and safety within the organisation.
- Will ensure that the company complies with the legislative requirements of the NT Workplace Health and Safety Act 2007.
- Will undertake a full review of the OHS&W systems operating within Mithril in conjunction with the appropriate consultative group/person every 12 months.

### Managers

#### *Managers have responsibility in their areas of control to:*

- Carry out their roles and responsibilities as detailed in the relevant health and safety policies and procedures.
- Ensure all risks to health and safety are identified, assessed and effectively controlled.
- Provide employees with the necessary skills, training and equipment to safely undertake their work (eg First Aid courses).

## Supervisors-Senior Geologists

*Persons with supervisory responsibilities have a responsibility to:*

- Implement relevant health and safety policies and procedures in their areas of control.
- Provide the necessary information, instruction and training to workers under their control.
- Ensure workers carry out their jobs effectively and safely.

## Employees

*Workers have a responsibility to:*

- Protect their own health and safety and to avoid adversely affecting the health and safety of other persons in the workplace.
- Report any incident or hazards at work to management as soon as possible after the event.
- Ensure that all equipment provided for health and safety purposes is used correctly.
- Obey all instructions, such as policies and procedures issued to protect their own personal health and safety, and the health and safety of others.
- Report or make recommendations to management to avoid, eliminate or minimize any hazards of which they are aware regarding working conditions or methods.
- Ensure that they are not, by the consumption of alcohol or a drug, in such a state as to endanger their own safety at work or the safety of any other person at work.
- Keep their work area tidy.

Specific Roles and Responsibility have been assigned to:

- The Responsible Officer (**David Hutton** - Managing Director)
- Managers (**Jim McKinnon-Matthews** – Chief Geologist)
- Supervisors-Senior Geologists (**Amy Lockheed and Damien Mizow** – Senior Geologists)

## **2. EXPLORATION METHODS**

Mithril's team may use the following exploration tools:

- remote sensing including the analysis of satellite and airborne imagery;
- airborne geophysics;
- surface geological mapping;
- surface geochemical surveys - sampling of soil, rock chip or drainage system;
- surface geophysical surveys;
- digging of costeans or trenches to facilitate sampling;
- reconnaissance drilling - isolated drill hole;
- target drilling – multiple drill holes, widely spaced (>500m) in a single project area;
- delineation drilling – closely spaced drilling in a discovery area to outline a resource;
- establishment of tracks to support exploration activities;
- bulk sampling and trial mining, and
- if exploration results in the discovery of an economic resource, bulk sampling and trial mining potentially including the construction of shafts or declines.

## **3. STAGES OF EXPLORATION**

### **3.1 Reconnaissance/Area Selection**

Before beginning on-ground exploration activities, Mithril may identify broad areas of interest by applying the knowledge of ore forming processes to existing datasets such as regional geology, government reports and file searches of historical information. This may then be followed up by:

- remote sensing, including the study of satellite imagery, high level aerial photography and airborne geophysical data;
- geochemical sampling;
- ground follow-up with reconnaissance level geological mapping, surface geochemistry and surface geophysics.



### **3.2 Target Selection**

Target selection is based on interpretation of all of the available information and would typically include ground based mapping programs, geochemical sampling programs and geophysical surveys. A typical program would involve 4 to 6 people operating from a small “fly” camp in 4WD vehicles. Auger, air core or RAB drilling equipment may be used during this phase of exploration. Airborne geophysical surveys may also be used.

### **3.3 Target Testing — Evaluation**

This stage includes drilling, initially with a single mobile drill rig. A typical target stage drill program would employ 4-6 people. A base camp would be required (tents or portable trailers/caravans). Tracks will need to be established to mobilize the equipment. Mithril’s aim during this target testing stage is to avoid or minimize local impacts, leaving post-exploration landscapes as close to pre-exploration condition as possible. Several widely spaced drill holes are typically required.

### **3.4 Discovery and Resource Delineation**

If the exploration is successful and a discovery is made further drilling to determine the extent (size) and grade of the mineralisation will be required. Such a program would most likely involve multiple drill rigs and a larger exploration crew (>6 people). The activity would typically be focused on the discovery area covering an area of 1-2 km<sup>2</sup>. If the subsequent resource appears to have the potential of being economic the project may enter a scoping study phase with additional drilling and baseline studies.

### **3.5 The Overall Program**

Some exploration programs may not follow set stages but when they do, there is likely to be a gradual transition from one stage to another. Often, different stages occur concurrently in different parts of the same exploration area.

Environmental impacts of these activities vary and Table 1 provides a guide to the level of impact each activity may have. As most exploration does not result in mining, the effects are likely to be short term, provided that the site is rehabilitated which is Mithril’s standard practice. The important issues are the extent and intensity of the impacts and the degree to which they can be remedied.

#### **4. OBJECTIVES AND TARGETS**

The environmental performance objectives that have been set by Mithril Resources are outlined below. The following sections shows how Mithril intends to meet these environmental goals.

Objectives and targets will be reviewed annually to allow for continual improvement.

Objective 1: Minimise the risk to employees, contractors, the public and other third parties.

Objective 2: Minimise disturbance and avoid contamination to soil.

Objective 3: Avoid the introduction or spread of pest plants and animals and implement control measures as necessary.

Objective 4: Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.

Objective 5: Avoid disturbance to sites of cultural and heritage significance.

Objective 6: Minimise disturbance to native vegetation and native fauna.

Objective 7: Remediate and rehabilitate operational areas to agreed standards.

## Environmental Objectives and Assessment Criteria

Environmental Objectives	Comment	Guide to How Objectives Can Be Achieved	Assessment Criteria
<b><u>Objective 1:</u></b> <b><u>Minimise the risk to employees, contractors, the public and other third parties.</u></b>	<p>The criteria for assessing the achievement of this objective have been developed on the basis of the current understanding of the field activities to be undertaken.</p> <p>The key to achieving this objective in relation to both down-hole abandonment and surface drill site restoration is to ensure that the visual prominence of the abandoned well site and its access track(s) is minimised to the extent where it is difficult for third parties to detect and therefore access these sites.</p> <p>The backfilling of all sumps and the removal of rubbish from the restored drill site should be carried out.</p>	<p>All employees and contract personnel complete an induction prior to commencement of work in the field.</p> <p>Signage in place to warn third parties of access restrictions to operational areas.</p> <p>All appropriate PPE (personnel protective equipment) is issued and available as required in accordance with company operating requirements and applicable standards.</p> <p>Effective Emergency Response Plan (ERP) and procedures are in place.</p> <p>Annual exercise of ERP.</p> <p>Communication of potential hazards to safety associated with drilling operations to potentially affected parties prior to commencement of operations.</p> <p>Reporting systems for recording injuries and accidents in place, and annual; (at minimum) review of records to determine injury trends.</p> <p>Implementation of appropriate corrective actions.</p> <p>Ensuring safety and environment management plans are updated and reviewed.</p>	<p>Zero Lost Time Injuries (LTI's)</p> <p>Zero Medically Treated Injuries (MTI's)</p> <p>Reasonable measures implemented to ensure no injuries to the public or third parties.</p>
<b><u>Objective 2:</u></b> <b><u>Minimise disturbance and avoid contamination to soil.</u></b>	<p>The impacts associated with soil disturbance can potentially include compaction, wind and water erosion and dust generation.</p>	<p><b><u>Drill site, grid line and access track construction</u></b></p> <p>Minimise the footprint of the drill site, camp and access tracks.</p> <p>Use existing tracks and consider alternate routes during planning phase to minimise environmental impacts</p> <p>Where possible avoid track construction and either walk or drive over vegetation.</p>	<p><b><u>Drill site, grid line and access track construction</u></b></p> <p>No significant long term impact to soil, flora and fauna in the area of disturbance.</p> <p>Minimise off-road driving or creation of shortcuts.</p>

	<p>The main source of disturbance to soils is associated with Access track construction, camp, drill pads, creation of borrows pits, restoration activity and vehicle movements.</p>	<p>Topsoil stockpiled from sump construction and respread on abandonment.</p> <p>Construct and rehabilitate drill pads, grid lines and tracks in line with advisory notes (attached).</p> <p><b><u>Fuel and Chemical Storage and Handling</u></b></p> <p>All fuel, oil and chemical storages banded in accordance with the appropriate standards</p> <p>Records of spill events and corrective actions maintained in accordance with company procedures.</p> <p>Spills or leaks are immediately reported and clean up actions initiated.</p> <p>Logged incidents are reviewed annually to determine areas that may require corrective action in order to reduce spill volumes in subsequent years (and drive continual improvement).</p> <p>Chemical and fuel storage procedures are reviewed and monitored in audit process.</p> <p><b><u>Waste Disposal (domestic, sewage and sludges)</u></b></p> <p>Covered bins are provided for the collection and storage of wastes.</p> <p>All loads of rubbish are covered during transport to the central waste facility.</p> <p>Pits are not established in locations, which pose an unacceptable hazard to stock or wildlife.</p> <p>Where appropriate a weed and feral animal management strategy is in place (avoidance and control strategies).</p> <p>Rig and vehicle wash downs are designed to minimise impacts .</p>	<p><b><u>Fuel and Chemical Storage and Handling</u></b></p> <p>No spills/leaks outside of areas designed to contain them.</p> <p><b><u>Waste Disposal</u></b></p> <p>No litter of waste to escape designated waste repositories.</p> <p>No spills or leaks from sewage treatment process and sludge pits.</p> <p>No weeds or feral animals are introduced to operational areas.</p>
<p><b><u>Objective 3:</u></b></p> <p><b><u>Avoid the introduction or spread of pest plants and animals and implement control measures as necessary.</u></b></p>	<p>Activity associated with lease and access track construction, such as movement of vehicles and equipment, is a potential source of weed or disease introduction and spread.</p> <p>The most effective technique to prevent the introduction and spreading of weed species</p>	<p>Where appropriate a weed and feral animal management strategy is in place (avoidance and control strategies).</p> <p>Rig and vehicle wash downs are initiated in accordance with the management strategy.</p> <p>If new weeds or feral animals are identified appropriate control measures are implemented.</p>	<p>No weeds or feral animals are introduced to operational areas.</p>

	is to ensure that vehicles and equipment are appropriately cleaned prior to entry into a construction site.		
<b><u>Objective 4:</u></b> <b><u>Minimise disturbance to drainage patterns and avoid contamination of surface waters and shallow ground water resources.</u></b>	The main threats to drainage patterns and surface waters, and shallow ground waters are considered to be interruption of natural flows as a result of earthworks and contamination. Operation area selection should aim to minimise impact to drainage systems, by avoiding sensitive areas and appropriate construction methods to avoid windrows.	<b><u>Access Track Construction</u></b> Avoid construction of tracks in the vicinity of drainage channels where possible.	<b><u>Access Track Construction</u></b> Access tracks are located and constructed to maintain pre-existing water flows (i.e. channel contours are maintained on floodplains and at creek crossings).
		<b><u>Drilling Mud Sumps</u></b> All drill cuttings, muds and non toxic drill fluids are contained within the designated mud sumps with adequate freeboard at the completion of operations to allow for a 30cm m cover of clean fill at remediation.	<b><u>Drilling Mud</u></b> No overflow of drill cuttings, muds and other drilling fluids from mud sumps. No non mineral waste material disposal to sumps.
		<b><u>Fuel and Chemical Storage and Handling</u></b> All fuel, oil and chemical storages banded in accordance with the appropriate standards Spills or leaks are immediately reported and clean up actions initiated. Chemical and fuel storage procedures, including signage, are reviewed and monitored in audit process	<b><u>Fuel/Chemical Storage and Handling</u></b> No leaks/spills outside of areas designed to contain them.
<b><u>Objective 5:</u></b> <b><u>Avoid disturbance to sites of cultural and heritage significance.</u></b>	The aim of the objective is to ensure that any sites of cultural (Aboriginal or non-Aboriginal) heritage significance are identified and protected.	Consultation with stakeholders (i.e. government agencies, landholders etc) in relation to the possible existence of heritage sites, as necessary. Cultural heritage surveys will be conducted over all areas planned for ground disturbing activities	Areas identified for ground disturbing activities are surveyed and any sites of Aboriginal and non-Aboriginal heritage identified. Any identified cultural and heritage sites have been avoided.
<b><u>Objective 6:</u></b> <b><u>Minimise disturbance</u></b>	Primary risks to native fauna include clearing of	<b><u>Access Track Construction and Restoration</u></b> Proposed drill sites, camp sites, access tracks and borrow pit are	<b><u>Access Track and drill pads construction and Restoration</u></b>

<b><u>to native vegetation and native fauna.</u></b>	habitat and obstruction of movement through cleared areas, the presence of borrow pits, fuel and chemical storage and management, and waste management activities.	visually assessed for rare, vulnerable and endangered flora and fauna species before the commencement of construction. Consider alternate routes/sites during planning phase to minimise environmental impacts Facilities (e.g. borrow pits, drill sumps) are designed and constructed as far as practicable to minimise fauna entrapment.	Any sites with rare, vulnerable and endangered flora and fauna are identified and avoided. No un-neccessary impacts to environment. Footprint of sites is minimised.
		<b><u>Waste Management</u></b> Covered bins are provided for the collection and storage of wastes. All loads of rubbish are covered during transport to the central waste facility. Pits are not established in locations, which pose an unacceptable hazard to stock or wildlife.	<b><u>Waste Disposal</u></b> No litter of waste to escape designated waste repositories. No spills or leaks from sewage treatment process and sludge pits. <b><u>Introduced species</u></b> On weeds or feral animals introduced to operational areas
			<b><u>Fuel and Chemical Storage and Management</u></b> No leaks/spills outside of areas designed to contain them.
<b><u>Objective7: Remediate and rehabilitate operational areas to agreed standards.</u></b>		<b><u>Well Site and Access Track Restoration</u></b> Rehabilitation/ abandonment plans for surface activities will be developed in consultation with relevant stakeholders and in sympathy with advisory notes (attached) Compacted soil areas ripped and soil profile and contours are reinstated following completion of operations.	<b><u>No unresolved reasonable stakeholder complaints.</u></b> All stakeholders are satisfied with rehabilitation. Contaminated site are remediated. <b><u>Drill site and access track restoration</u></b> minimise visual impact of abandoned drill sites minimise visual impact of abandoned access tracks re-establish natural vegetation on abandoned drill sites and access tracks

## 5. IDENTIFICATION OF ENVIRONMENTAL IMPACTS

The section identifies and assesses the potential environmental hazards and their consequences, resulting from field and drilling operations.

A clear procedure is in place where job groupings are compiled, risk are identified and specific controls are put in place to control those risks. These risks have been identified by experience Mithril personnel to allow for the assessment of environmental risks and management requirements.

A hazard is considered to be any source of potential environmental harm, or a situation or event with potential to cause loss. To identify hazards, the various activities associated with each stage of operation were considered along with the events that could lead to a hazardous situation. The possible consequences of such events were also identified and assessed.

Environmental hazards and potential consequences have been identified and assessed on the basis of existing information however and if pre-existing information was not available the hazards and potential consequences are based on the experiences of exploration and mining personnel.

Based on available information and experience the environmental hazards that have the potential to result in the most significant environmental consequences are considered to be;

- earthworks associated with drill site preparation, camp, track construction and site rehabilitations.
- Impacts occurring during drilling operations
- Impacts occurring during geophysical operations (ground and air)
- Storage of hazardous materials, fuels and chemicals
- impacts relating to domestic and chemical waste
- Field operations (including vehicle movements)
- Fire
- Extreme weather conditions

Key potential environmental consequences associated with the above hazards are:

- danger to health and safety of employees, contractors and/or the public
- contamination of soil,
- contamination of groundwater and/or watercourses

- atmospheric pollution
- noise pollution
- disturbance to Aboriginal and non-Aboriginal cultural heritage sites
- loss of native vegetation and habitat
- soil erosion and disturbance to natural drainage patterns
- disturbance or injury to native fauna and livestock
- injury to or loss of stock and wildlife
- introduction and/or spread of weeds, pest plants, animals and pathogens

The tables below show the potential hazards related to various activities, the potential consequences related to those hazards and management strategy for each of the potential consequences.

### 5.1 Environmental impacts relating to drill site preparation, camp, track construction and site rehabilitation:

Environmental hazards associated with drill site and access track construction include heavy vehicle movement, earthworks, vegetation clearance, spills associated with chemical, fuel storage and waste disposal.

Activity / Hazards	Consequences and potential impacts
Earthworks	<ul style="list-style-type: none"> <li>• Damage to native vegetation</li> <li>• Introduction and/or spread of weeds</li> <li>• Disturbance to natural drainage patterns</li> <li>• Damage to third party infrastructure</li> <li>• Soil erosion</li> <li>• Inversion of soil profile</li> <li>• Dust generation</li> <li>• Soil compaction</li> <li>• Disturbance to cultural heritage sites</li> </ul>
Vegetation clearing	<ul style="list-style-type: none"> <li>• Impeded fauna movement through construction zone</li> <li>• Loss of vegetation and fauna habitat</li> <li>• Damage to native vegetation</li> <li>• Disturbance to cultural heritage sites</li> <li>• Soil erosion</li> <li>• Short to medium term loss of visual amenity</li> </ul>
Movement of heavy machinery and vehicles along proposed access routes and drill sites	<ul style="list-style-type: none"> <li>• Dust generation</li> <li>• Soil compaction</li> <li>• Soil erosion</li> <li>• Damage to native vegetation</li> <li>• Injury or death of native fauna</li> <li>• Disturbance to cultural heritage sites</li> </ul>



	<ul style="list-style-type: none"> <li>• Introduction and/or spread of weeds</li> <li>• Damage to third party infrastructure</li> <li>• Disruption to land use (eg. grazing and recreation)</li> <li>• Increased public access to remote areas</li> </ul>
Presence of borrow pits	<ul style="list-style-type: none"> <li>• Injury to or loss of stock and wildlife</li> <li>• Dispersal of watering points and redistribution of stock movements</li> </ul>
Spills and leaks associated with chemical and fuel storage	<ul style="list-style-type: none"> <li>• Localised contamination of soil</li> <li>• Contamination of water resources (surface and groundwater)</li> <li>• Access to contaminants by stock and wildlife</li> <li>• Danger to health and safety of employees, contractors and possibly the public</li> </ul>

## 5.2 Environmental impacts relating to drilling operations

Activity / Hazards	Consequences and potential impacts
Spill associated with onsite drilling	<ul style="list-style-type: none"> <li>• Contamination of soil, groundwater and /or watercourses</li> </ul>
Vehicle movement to and from drill rig	<ul style="list-style-type: none"> <li>• Dust generation</li> <li>• Soil compaction</li> <li>• Soil erosion</li> <li>• Collision with other road users</li> <li>• Damage to native vegetation</li> <li>• Disturbance to cultural heritage sites</li> <li>• Introduction and/or spread of weeds</li> <li>• Damage to third party infrastructure</li> <li>• Disruption to land use (eg. grazing and recreation)</li> <li>• Collision with stock or wildlife resulting in injury or loss</li> </ul>

## 5.3 Environmental impacts relating to geophysical operations

Activity / Hazards	Consequences and potential impacts
Spill associated with onsite geophysical surveys	<ul style="list-style-type: none"> <li>• Contamination of soil, groundwater and /or watercourses</li> </ul>
Vehicle movement (ground) to and from geophysical sites	<ul style="list-style-type: none"> <li>• Dust generation</li> <li>• Soil compaction</li> <li>• Soil erosion</li> <li>• Collision with other road users</li> <li>• Damage to native vegetation</li> <li>• Disturbance to cultural heritage sites</li> <li>• Introduction and/or spread of weeds</li> <li>• Damage to third party infrastructure</li> <li>• Disruption to land use (eg. grazing and recreation)</li> <li>• Collision with stock or wildlife resulting in injury or loss</li> </ul>
Vehicle movement (air) during geophysical survey	<ul style="list-style-type: none"> <li>• Dust generation</li> <li>• Collision with other aircraft</li> <li>• Introduction and/or spread of weeds</li> <li>• Disruption to land use (eg. grazing and recreation)</li> </ul>

**5.4 Environmental impacts relating to domestic and chemical waste**

Activity / Hazards	Consequences and potential impacts
Storage and transportation of domestic wastes	<ul style="list-style-type: none"> <li>Scavenging by native and pest species</li> <li>Pest outbreaks</li> <li>Localised contamination of soil and/or groundwater</li> </ul>
Sewage treatment and disposal to earthen pits	<ul style="list-style-type: none"> <li>Localised contamination of soil and/or groundwater</li> </ul>
Disposal of drill cuttings and muds to excavated sumps	<ul style="list-style-type: none"> <li>Localised contamination of soil and/or groundwater</li> <li>Access by stock and wildlife</li> </ul>

**5.5 Environmental impacts relating to storage of hazardous materials, fuels and chemicals**

Activity / Hazards	Consequences and potential impacts
Spills associated with transport of fuels and chemicals (via truck)	<ul style="list-style-type: none"> <li>Localised contamination of soil</li> <li>Contamination of water resources (surface and groundwater)</li> <li>Danger to health and safety of employees, contractors and possibly the public</li> <li>Access to contaminants by stock and wildlife</li> </ul>
Spills associated with chemical and fuel storage and handling	<ul style="list-style-type: none"> <li>Localised contamination of soil</li> <li>Contamination of water resources (surface and groundwater)</li> <li>Access to contaminants by stock and wildlife</li> <li>Danger to health and safety of employees, contractors and possibly the public</li> </ul>

**5.6 Environmental impacts relating to field operations including vehicle movement**

Activity / Hazards	Consequences and potential impacts
Vehicle movement	<ul style="list-style-type: none"> <li>Dust generation</li> <li>Soil compaction</li> <li>Soil erosion</li> <li>Collision with other road users</li> <li>Damage to native vegetation</li> <li>Disturbance to cultural heritage sites</li> <li>Introduction and/or spread of weeds</li> <li>Damage to third party infrastructure</li> <li>Disruption to land use (eg. grazing and recreation)</li> <li>Collision with stock or wildlife resulting in injury or loss</li> </ul>

**6 MANAGEMENT OF ENVIRONMENTAL IMPACTS**

There is a range of potential environmental risk and potential impacts inherent in drilling and field operations. An environmental risk is the chance that an environmental consequence will occur as a result of a hazardous situation or event (see above). Given appropriate management measures, most risks can be avoided or reduced to a level that is acceptable. However, in some cases there may still be 'residual' risks that are retained after management measures have been implemented.

An environmental risk assessment evaluates the level of environmental risk associated with various operations and activities and provides a framework for assessing risk management priorities and options based on the level of each assessed risk. The level of risk is directly relates to the severity of consequences of a hazard occurring and its likely frequency of occurrence. Tables showing the likelihood and consequence of an event occurring and how they have been graded is shown below.

### 6.1 Severity of Consequences

Environmental consequences can be categorised from negligible to disastrous using a qualitative methodology and have been expanded to incorporate impacts to environmental values such as flora, fauna and biomass of biota.

Severity	Qualitative Description of Environmental Consequences
Negligible	Possible incidental impacts to flora and fauna in a locally affected land system but without ecological consequence. No impacts to aquifers.
Minor	Changes to the abundance or biomass of biota, and existing soil and/or water quality in the affected land system, but no changes to biodiversity or ecological function.. No measurable change to aquifer water quality.
Major	Changes to the abundance or biomass of biota, and existing soil and/or water quality in the affected land system, with local changes to biodiversity but no loss of ecological function. Detectable change to aquifer water quality.
Severe	Substantial changes to the abundance or biomass of biota, existing soil, and/or water quality and aquifers in the affected land system with significant change to biodiversity and change of ecological function. Eventual recovery of ecosystem possible, but not necessarily to the same pre-incident conditions. Substantial changes to aquifer water quality.
Disastrous	Irreversible and irrecoverable changes to abundance/biomass and aquifers in the affected area. Loss of biodiversity on a regional scale. Loss of ecological functioning with little prospect of recovery to pre-incident conditions. Contamination of aquifers remote from operations.

### 6.2 Likelihood of occurrence

The likelihood of potential environmental consequences occurring was qualitatively assessed and categorised according to the criteria outlined in the table below. Operation lifetime for the purpose of due diligence will be 20 years.

Likelihood of Occurrence	Qualitative description of exposure
Virtually impossible	Has almost never occurred, but conceivably could
Rare	Has occurred a few times worldwide
Unlikely	Not likely during operation lifetime
Likely	Likely to occur during operation lifetime
Virtually certain	Likely to occur regularly at least once per year

### 6.3 Risk Assessment

Severity and likelihood of consequences are combined to produce a level of risk for any given hazard. The table below shows an environmental risk assessment matrix that compares likelihood and severity of environmental consequences arising from the operations.

			LIKELIHOOD OF CONSEQUENCE				
			1	2	3	4	5
			Virtually Impossible	Rare	Unlikely	Likely	Virtually Certain
SEVERITY OF CONSEQUENCE	E	Negligible Effect	LOW	LOW	LOW	LOW	LOW
	D	Minor Effect	LOW	LOW	MEDIUM	MEDIUM	MEDIUM
	C	Major Effect	MEDIUM	MEDIUM	MEDIUM	MEDIUM	HIGH
	B	Severe Effect	MEDIUM	MEDIUM	MEDIUM	HIGH	HIGH
	A	Disastrous Effect	MEDIUM	MEDIUM	HIGH	HIGH	HIGH

### 6.3.1 Risk rating of environmental impacts due to drill site preparation, camp and access track construction and drill site preparation and rehabilitation:

Activity / Hazards	Activity / Hazards	Severity	Likelihood	Risk
Environmental impacts relating to drill site preparation, camp and access track construction and drill site preparation and rehabilitation	Earthworks	Negligible	Rare	LOW
	Vegetation clearing	Minor	Unlikely	MEDIUM
	Movement of heavy machinery and vehicles along proposed access routes and drill sites	Negligible	Unlikely	LOW
	Presence of borrow pits	Negligible	Unlikely	LOW
	Spills and leaks associated with chemical and fuel storage	Negligible	Unlikely	LOW
	Spills and leaks associated with chemical and fuel transportation	Negligible	Unlikely	LOW

### 6.3.2 Environmental impacts relating to drilling operations

Activity / Hazards	Activity / Hazards	Severity	Likelihood	Risk
Environmental impacts relating to drilling operations	Spill associated with onsite drilling	Negligible	Rare	LOW
	Vehicle movement to and from drill rig	Minor	likely	MEDIUM

### 6.3.3 Environmental impacts relating to geophysical operations

Activity / Hazards	Activity / Hazards	Severity	Likelihood	Risk
Environmental impacts relating to geophysical operations	Spill associated with onsite geophysical surveys	Minor	Rare	Low
	Vehicle movement (ground) to and from geophysical sites	Minor	Rare	Low
	Vehicle movement (air) during geophysical survey	Minor	Rare	Low

**6.3.4 Environmental impacts relating to waste management**

Activity / Hazards	Activity / Hazards	Severity	Likelihood	Risk
Environmental impacts relating to waste management	Storage and transportation of domestic wastes	Negligible	Unlikely	Low
	Sewage treatment and disposal to earthen pits	Negligible	Unlikely	Low
	Disposal of drill cuttings and muds to excavated sumps	Negligible	Unlikely	Low

**6.3.5 Environmental impacts relating to chemical handling and storage**

Activity / Hazards	Activity / Hazards	Severity	Likelihood	Risk
Environmental impacts relating to chemical handling and storage	Spills associated with transport of fuels and chemicals (via truck)	Minor	Unlikely	Medium
	Spills associated with chemical and fuel storage and handling	Minor	Unlikely	Medium

**6.3.6 Environmental impacts relating to field operations including vehicle movement**

Activity / Hazards	Activity / Hazards	Severity	Likelihood	Risk
Environmental impacts relating to field operations	Vehicle movement	Negligible	Unlikely	Low
	Fire	Sever	Unlikely	Medium

**7 RISK CONTROL MEASURES**

Mithril is committed to good planning, minimizing environmental impacts and reducing overall costs through avoiding damage and costly remedial works.

Education is an important element in environmental management. Contractors and employees are required to understand and comply with Mithril's environmental policy, practices and objectives.

Staff and contractors are advised of the following principles:

- movement of vehicles in wet weather is avoided to minimize damage to tracks and other areas, avoiding erosion problems later;
- common terrain or vegetation types are favoured for access and physical activity because they are generally of lower conservation value and less sensitive to disturbance;
- natural, biological or cultural features likely to be affected by proposed mining are identified during exploration planning; (If they are believed to exist in a planned exploration area then appropriate impact avoidance and minimization procedures are incorporated into the exploration program);

- timing of access is important to limit the impact of exploration on migratory birds and breeding times for native fauna.

## **7.1 Consultation**

Consultation has been undertaken between Mithril Resources and all relevant stake holders. Good consultation reduces the chance that significant risks are overlooked. The relevant stake holders that have been identified include;

- The Department of Mines and Petroleum, Western Australia

Government Departments have been consulted in line with statutory requirements.

## **7.2 Personnel Training**

All staff working with Mithril receives environmental management training as well as specific training for particular exploration areas. The training includes:

- any regulations applying to the area, including specific conditions on the Exploration License;
- work practices that avoid or minimize environmental impacts;
- landowner or manager sensitivities;
- minimizing impacts in environmentally sensitive areas, particularly about special precautions with soil pathogens, weeds etc; and
- the use of vehicles off-road.

## **7.3 Minimizing Disturbance and impacts due to drill site preparation, camp and access track construction and drill site preparation and rehabilitation.**

The first priority in all of Mithril's exploration activities for environmental and cost advantage is to use existing tracks wherever practicable.

Grid lines on which to conduct geological, geochemical and geophysical surveys are marked by wooden pegs and/or biodegradable flagging tape. In heavily wooded areas, grid lines may need to have lines of sight established by cutting vegetation, but no trees are felled and there is minimal soil disturbance.

Mithril endeavours not to clear tracks, but to walk or drive over the vegetation to visit sites, ensuring that even where plants are crushed, root stocks remain. Trees, particularly old growth trees, are retained where practicable.

If tracks must be constructed, field visits and advance planning minimize environmental disturbance by:

- positioning tracks along ridge tops or on the bottom slopes some distance from watercourses;
- rolling, or clearing with a grader/dozer blade set slightly above ground level;
- avoiding clear visibility from existing tracks or highways (by incorporating a dog-leg soon after entry);
- construction will be to no greater need than is required by the exploration program.

Tracks are designed and sited to minimize likely recreational vehicle use. Broadly curving tracks create less visible impact at ground level than straight tracks and travel speeds are lowered, reducing dust generation. Where vegetation and topsoil must be removed, the minimum area possible is cleared and the materials stored for later use in rehabilitation.

Access tracks and sites are prepared in sympathy with the advisory notes provided by relevant government authorities.

#### **7.4 Minimising disturbance during drilling operations**

The three basic techniques of rotary air blast (RAB), reverse circulation (RC) and diamond drilling, have similar environmental effects, differing mainly in access requirements and the extent of ground compaction.

Mithril favours drilling rigs that minimize site impacts (lighter rigs and those mounted on lower ground pressure tracks or large-tired vehicles). Such rigs offering the following benefits:

- increased efficiency on a site;
- reduced soil compaction;
- minimized topsoil removal from drill sites; and
- reduced overall impact on access tracks.

Where topsoil has to be removed it is stored nearby in low mounds together with any plant litter. Topsoil is then returned as soon as possible (preferably within 6 months) to maintain seed viability and microbial activity. If drilling sumps are required then soil and sub-soil is stockpiled separately and replaced in the reverse order to its excavation.

It may be necessary to clear vegetation to reduce a bushfire hazard. Also, all drill rigs are required to have knapsack spray extinguishers, fire extinguishers and correctly fitted and maintained exhaust systems. Driving vehicles in long dry grass is avoided to reduce the chance of fire.

Drilling activities often encounter substantial quantities of water and particular care is taken to contain it specifically if it is Saline. Even where there is good quality water, care is taken to avoid water logging of drought resistant vegetation.

When diamond drilling occurs, sumps are constructed to contain drilling fluids and to act as settling chambers for the ground rock produced in the process. The sumps are always placed down slope of the drill rig to ensure all site run-off drains into the sump. Depending on the geology and/or the need for drilling additives, it is sometimes necessary to line sumps with plastic sheeting. In particularly sensitive areas, portable above-ground tanks may be used. Drilling fluids are reused and recycled and at the end of their use, are generally left to dry out and then buried. Biodegradable drilling additives are used whenever possible.

Refuelling of vehicles is conducted away from drainage lines and always conducted over absorbent matting to minimize the chance and impact of spills.

### **7.5 Fuel Storage and spills**

All hydrocarbons and chemicals will be stored in appropriately bunded areas. The bunded areas will be constructed such that the volume of the bunded area is equal to the volume of the substance plus an appropriate safety margin.

During the site induction all personnel will be trained in the clean-up of diesel spills and the requirement to report diesel spills to the senior Mithril site representative.

Diesel spill kits will be located at refuelling stations and adjacent to plant using diesel.

All spills should be dealt with immediately and all large spills should be treated as an environmental emergency, see below.

### **7.6 Domestic and chemical waste products.**

All personnel will be instructed in correct waste management during their site induction.

Covered bins will be used for the collection and storage of wastes. All loads of rubbish will be covered during transport to the central waste facility. Rubbish bins or pits will be established in locations, which minimise the threat to stock or wildlife.

Waste waters from kitchens and showering facilities are directed to earth drains designed to prevent discharge unless septic tanks have been installed in which case all waste water is contained within them.

Toilet facilities may consist of drill holes or chemical systems. Any necessary pits are covered with a minimum of one meter of fill.

All rubbish is taken off site and disposed of at appropriate licensed waste facilities.



## **7.7 Natural Drainage Patterns**

Stream sediment geochemistry or geological mapping may be conducted close to natural drainage lines, whether ephemeral or permanent. If tracks are built, disturbance to watercourses and riparian vegetation is avoided.

In arid areas, drainage may occur by sheet flow rather than channel flow. Mulga plant communities may depend on this method of water replenishment. In these terrains sufficient drains to provide channel ways are constructed across tracks to restore the sheet flow conditions as rapidly as possible. If tracks are created by clearing, care is taken to avoid windrows on the margins, as these interrupt the overland flow of water, channelling flow along their margins to cause erosion. Similarly, built up sections of track will include culverts to lessen interference with sheet or channel water flow.

## **7.8 Invasive species management**

Weeds identified in the area: Existing weed species should be identified in the operational area.

Management of weed movement: Weed dispersal will be controlled through the instruction of personnel on methods reducing the impact of weeds. In particular, at the beginning of the program all vehicles must be and all vegetable matter should be washed from the undercarriage of the vehicles.

Monitoring of weeds: Weed distribution will be monitored as part of the Pre-Disturbance and Rehabilitation checklist.

## **7.9 Noise and air quality management**

Noise and air pollution will be minimised where possible. Where risks cannot be eliminated personal protective equipment will be provided to all exposed personnel consistent with Mithril's OHS policies and relevant parts of the Occupational Health and Safety Manual.

## **7.10 Culture and heritage management**

All exploration licenses granted to Mithril Resources have been subject to searches conducted by the Aboriginal Areas Protection Authority or their equivalent body. If an area has an identified site it is avoided.

In areas where ground disturbing work is required a heritage survey is conducted with the central land council who provides a clearance certificate outlining the locations of any sites of significance and/or areas to be avoided.

As entry to identified sites is to be avoided no monitoring will take place.

## **8. REHABILITATION**

### **8.1 Non-Intrusive Exploration**

Geological mapping, geochemical sampling, airborne geophysics and ground-based gravity and magnetic surveys leave behind little if any impact. Induced polarization and electromagnetic surveys can require cable arrays and small (<1m x 1m x 20cm deep) pits/probes to ensure electrical contact with the ground. Aluminium foil is often used to line the pits. Rehabilitation after geophysical surveys requires carefully retrieving cables to avoid vegetation damage, collecting aluminium foil and replacing soil in the pits in the reverse order to which it was extracted. Pits are dug where minimal vegetation exists (except perhaps low grasses). The impacts of these types of surveys is minimal.

Wooden pegs and biodegradable tape used to mark survey lines is removed wherever possible. Where metal pegs have been used, they are removed.

### **8.2 Access Tracks**

Unless a specific request is made to leave a track in-place all tracks are rehabilitated to prevent erosion, to assist in re-vegetation and to prevent entry by other people.

For cleared tracks, campsites or other areas where constant use has caused compaction, the ground may be deep ripped by bulldozer or excavator, or shallow-ripped using grader tines or an agricultural harrow pulled by a four wheel drive vehicle to prepare it for either natural regeneration from surrounding seed stock, or for direct seeding.

In areas where natural regeneration is already occurring, small excavators fitted with extended ripper bars may be used to protect re-growth. Their manoeuvrability makes them the preferred equipment for contour ripping on slopes. Whatever equipment is used, ripping is rigidly confined to compacted areas, to maximize the protection of existing vegetation and minimize disturbed ground that is often preferentially colonized by weed species.

### **8.3 Drilling**

Any drill samples not removed from site or returned down holes are blended in with topsoil at the final ripping stage. If plastic bags have been used, they are disposed of offsite after removal of samples.

Best practice means that all holes are capped below ground level. Capping is conducted with plastic, concrete or other suitable materials to prevent erosion and animal injury or entrapment.

If groundwater has been encountered, sealing of the entire hole, or sections of it, may be necessary to prevent pollution of groundwater through connection of different quality aquifers.

### **8.4 Revegetation**

Where topsoil has been removed and stored for six months or more, seed viability and microbial activity may be diminished. Upon re-spreading, the topsoil may need supplementary seeding and fertilizing. However, in most cases narrow track development and small drill sites allow the surrounding vegetation to provide sufficient seed for natural regeneration, provided that the surface is rough and seeds are able to lodge and germinate.

With good housekeeping during exploration followed by replacement of topsoil, harrowing and ripping of any compacted areas, most disturbed areas will be restored to their natural condition.

When rehabilitation is complete, best practice includes a periodic inspection schedule to ensure that erosion control, weed control and re-vegetation work have been successful. Inspection timing and frequency depends on the terrain and climate.

## **9 REPORTING AND ENVIRONMENTAL AUDITS**

### **9.1 Environmental Checklist for Exploration Areas – For Mithril Employees and Subcontractors.**

Once an area has been selected for on-the-ground mineral exploration, three phases of activity take place:

- pre-exploration planning and preparation;
- implementation of the exploration program, and
- post exploration clean-up and assessment.

At the initial planning stage for each exploration program this check list will be updated. Throughout the exploration program, this checklist will be monitored to ensure that bad practices have not crept in to daily routines.

Mithril will hold discussions with relevant authorities and obtain relevant Guidelines or Codes.

At all times, responsibility lies with Mithril's on-site representative to ensure that guidelines are followed and standards maintained.

This checklist should be filled in for each separate exploration program or when the period of time between programs on the same area of ground exceeds 12 months.

#### **9.1.1 Before Exploration**

- Document and/or photograph all previous activities in the region.
- Consult EMP when constructing a campsite, encompassing fuel storage, waste disposal and recycling, site selection etc.
- Communicate with all interested parties, ensuring them that Mithril takes its environmental responsibilities very seriously.
- Ensure all relevant approvals are obtained.
- Prepare a plan for minimization of environmental impacts.

### **9.1.2 During Exploration**

- All disturbances to the environment must be kept to an absolute minimum, in particular clearing, tracks and managing hydrocarbons.
- When constructing drill pads avoid large trees & thick bushes, and keep dozer/loader blade above the ground surface where possible.
- Avoid placing drill pads on environmentally sensitive areas, for example, creek banks and steep slopes. Often the exact location of a drill hole can be slightly altered (check with geologist).
- Take precautions to avoid the spread of weed species.
- Ensure that mixing of any aquifers is prevented.
- If surfacing groundwater is highly saline, construct sumps to prevent it from spreading.
- If groundwater supply is limited, minimize its usage. Water resources in the Arid zone are scarce and usage should be limited at all times.
- Maintain communication with all interested parties.

### **9.1.3 Environmental Clean-up**

(To be completed directly after a drilling program.)

- Remove all litter and machinery from the exploration site.
- Remove or treat all contaminated soil.
- Ensure all holes are adequately capped.
- Backfill sumps if no longer required.
- Re-contour slopes if erosion is a problem.
- Maintain communication with all interested parties.

### **9.1.4 Rehabilitation**

(To be completed no later than 6 months after final drilling program.)

- Either remove or empty all sample bags, ensuring no plastic or calico remains on site.
- Backfill or bury all drilling sumps and holes, replacing topsoil last (allow for subsidence).

- Rip or scarify all disturbed areas.
- Spread fallen vegetation over all rehabilitated areas.
- Seed and fertilise rehabilitated area if necessary.
- Block off entrance to rehabilitated tracks.
- Invite landowner to view rehabilitation.
- Take reference photographs and record photography locations

## **10 ENVIRONMENTAL EMERGENCIES**

The Mining Management Act defines a serious accident as an event on a mining site that causes material environmental harm. Mithril treats all incidents that have the potential to cause material environmental harm as an environmental emergency.

### **10.1 Emergency Response plan**

The following procedure should be followed if during all environmental incidents;

- Identify the incident or emergency and its scope and potential impact.
- Assess the dangers and hazards associated
- If safe to do so, take action to minimise the impact.
- As soon as practical inform the senior Mithril site representative.

### **10.2 Emergency Response plan for Bushfire**

Camp sites, drill sites etc will be located in areas where bushfire fuel is minimal. If this is not possible then some clearing of the vegetation surrounding the camp or work locations may be required to form a fire break. All vehicles are fitted with fire extinguishers and a water source and fire extinguisher is located at the camp. In the event of a bushfire the following provides some basic rules (taken from RFDS safety and survival handbook third edition):

- Take immediate action to leave an area as soon as you become aware of the fire. Don't panic.
- When smoke is dense the air closest to the ground will most likely be cool and fresh.
- Do not attempt to run through flame fronts, if possible move downhill and avoid dense areas.
- If there is no possible escape put on as much clothing (not nylon) on exposed skin as possible and lie on the ground in a hole and cover yourself.

- If you are in a vehicle park it in a cleared area away from heavy fuel, close windows and doors, leave engine running and turn air-conditioning on (set to recycle).

### **10.3 Emergency Response plan for Hydrocarbon spill**

Most of Mithril's activities are in small exploration camps so fuel spills would be expected minor (such as accidental spillage during refuelling 4wd vehicles). More significant spills can occur around a drill rig where larger volumes of oils, greases and fuels are used. Absorbent matting will be readily available at the camp and it is a requirement by Mithril that any drill rig contracted must have their own fuel spill kit onsite at all times. The following procedure should be followed if a hydrocarbon spill occurs;

- Identify the product spilled
- Assess the dangers and hazards associated with the spill
- Stop the flow at the source if safe to do so and take action to contain the spilled product
- If the spilled product occurs on soil then once the spill is contained bag the contaminated soil and disposed at an appropriate site/depot.
- All fuel spills will be reported as part of Mithril's internal reporting procedure
- If a serious spill then this will be reported to the relevant Northern Territory authorities

**Examples of government, industry association and company guidelines or codes of practice for environmental management and for community consultation include:**

- *Mineral Exploration Code of Practice* — published by the Tasmanian Department of Mines.
- *Exploration and Rehabilitation of Exploration Sites — Guidelines for Environmental Management in Exploration and Mining* — published by the Victorian Department of Energy and Minerals.
- “Environmentally sound exploration practices, exploration in environmentally sensitive areas and exploration and mining in watercourses” in *Draft Technical Guidelines for Environmental Management for Mining in Queensland* — published by the Queensland Department of Minerals and Energy.
- *Code of Conduct for Mineral Exploration in Environmentally Sensitive Areas in the Northern Territory* — a joint publication by the NT Chamber of Mines and Petroleum (Inc), the NT Department of Mines and Energy and the NT Conservation Commission.
- *Landholder-Explorer Procedures* — jointly agreed between the Queensland Mining Council, Farmers’ Federation, United Graziers’ Association, Canegrowers’ Council and Graingrowers’ Association.
- *Guidelines for Mineral Exploration in Areas of Aboriginal Interest in Western Australia* — published by the Chamber of Mines and Energy of Western Australia Inc.
- *Code of Conduct for Mineral Exploration, Mining and Processing in Victoria* — published by the Victorian Chamber of Mines.
- *Environmental Handbook for Mineral Exploration Activities in SA* — published by the SA Department of Mines and Energy.
- Santos Ltd — various publications including Dozer Manual, Archaeology Procedures Manual and Codes of Environmental Practice for Drilling; Seismic and Production. Field handbooks to assist personnel to understand better the environment in which they work have also been produced by Santos.