Attachment R12

Flora and Fauna Management Plan

May 2022

Vista Gold Australia Pty Ltd

Mount Todd Project Area

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1. Introduction

1.1 Purpose

This Flora and Fauna Management Plan (the Plan) forms part of the Environmental Management System (EMS) for the Mount Todd Project Area MTPA and is considered a working document. It has been updated in formal consultation and assessment by Department of Primary Industry and Resources (DPIR) as part of the mining authorisation process in 2020 and submitted as an updated plan May 2022 to Department of Industry, Tourism and Trade (DITT)..

The MTPA involves several key activities during construction and operations that have the potential to impact upon flora and fauna. These activities include:

- Clearing of vegetation and fauna habitat;
- Clearing of individual threatened flora or habitat threatened flora;
- Introduction and/or spread of weeds;
- Introduction or increase in populations of pest fauna;
- Elevated levels of dust from mining operations;
- Elevated levels of noise from mining operations;
- Artificial lighting during night hours;
- Poisoning to fauna drinking from the tailings dam(s);
- Fauna collisions with vehicles; and
- Planned or unplanned bushfire.

The Plan has been developed to provide a clear and concise outline of the actions and methods required to mitigate potential impacts to biodiversity including:

- Procedures to be adopted during vegetation clearing, including wildlife rescue procedures;
- Pest and feral animal management;
- Mitigation of potential impacts to threatened species; and
- Operational procedures to limit the cumulative impacts of mining operations on flora and fauna.

The purpose of this Plan is to provide a framework for environmental management. The Plan has been developed in accordance with Northern Territory Environmental Protection Authority (NT EPA), Department of Environment and Energy (DEE) and Department of Primary Industry and Resources (DPIR) requirements, with reference to Commonwealth and Northern Territory (NT) legislation.

1.2 Objectives

The objective of this Plan is to reduce the impact of MTPA activities on biodiversity both on- and off-site through:

- Identifying the key biodiversity issues that require control measures;
- Developing strategies to manage impacts on biodiversity and implementing those strategies;

- Assigning responsibilities for impact monitoring and management;
- Providing sufficient information to assist with auditing the implementation of this Plan and
- Establishing a biodiversity monitoring program.

This Plan forms part of the Environmental Management Plan (EMP) for the MTPA and is considered a working document. It will be updated following formal assessment by Department of Primary Industry and Resources (DPIR) as part of the mining authorisation process.

1.3 Associated Management Plans

This Plan specifically applies to flora (excluding weeds) and fauna (including both native and non-native animals), however, consideration of the management of flora and fauna is also addressed in several other sub-management plans including:

- Air Quality Management Plan;
- Bushfire Management Plan;
- Noise, Vibration and Light Management Plan;
- Weed Management Plan;
- Waste Management Plan; and
- Mine Closure and Rehabilitation Plan.

1.4 Legislation and Guidelines

Legislation, guidelines and plans relating to the management of flora and fauna include:

1.4.1 Commonwealth Legislation

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);

1.4.2 Northern Territory Legislation

- *Bushfires Act 1980;*
- *Mining Management Act 2001;*
- *National Environment Protection Council (Northern Territory) Act 1994;*
- *Territory Parks and Wildlife Conservation Act 2006* (TPWC Act); and
- *Weed Management Act 2001.*

1.4.3 Guidelines

- Northern Territory Survey Methods for Flora and Fauna Surveys Used for Standard Biodiversity Unit Survey Sites;
- Survey Guidelines for Australia's Threatened Mammals. EPBC Act Survey Guidelines 6.5; and
- Survey Guidelines for Australia's Threatened Reptiles: Guidelines for Detecting Reptiles Listed as Threatened Under the EPBC Act.

1.4.4 Recovery and Abatement Plans

- Threat Abatement Plan for Predation by Feral Cats;

- Threat Abatement Plan to reduce the Impacts on Northern Australia's Biodiversity by the Five Listed Grasses;
- National Recovery Plan for the Gouldian Finch (*Erythrura gouldiae*); and
- National Recovery Plan for the Northern Quoll (*Dasyurus hallucatus*).

1.5 Previous investigations

This Plan has been prepared on the basis of information obtained from previous studies of the MTPA. A summary of previous investigations is provided in TABLE 1-1 SUMMARY OF FLORA AND FAUNA STUDIES

Table 1-1 Summary of flora and fauna studies

Date	Author	Description
Dec 2019 – Jan 2020	SLR	Baseline Cockatoo Grass (*Alloteropsis semialata*) Survey - 2019/20 season
Nov-Dec 2018	SLR	Baseline Cockatoo Grass (*Alloteropsis semialata*) Survey - 2018 season
Aug-Oct 2018	CDU	Dry Season Finch Survey (trapping, banding and morphological data collection, and abundance counts)
April-May 2018	SLR	Baseline Gouldian Finch offset habitat survey
Sep-Oct 2017	CDU	Reconnaissance surveys for Gouldian Finch monitoring
Aug-Nov 2017	CDU	2017 Dry Season Finch Survey (abundance counts, trapping, morphological data collection and blood analysis)
November 2017	Astrebla Ecology	Gouldian Finch Proposed Offset Habitat Biocondition Survey *(note – this survey recommended a further survey (SLR April- May 2018) when species diversity was higher).*
November 2017	Astrebla Ecology	Baseline Cockatoo Grass (*Alloteropsis semialata*) Survey - 2017 season *(note – data could not be obtained from this survey due to grasses being immature).*
October 2017	SLR	Threatened Species Habitat Survey (Northern Quoll and Northern Crested Shrike-tit)
September 2016	CDU	Reconnaissance surveys for Gouldian Finch monitoring
May 2014	GHD	Gouldian Finch nest survey of the MTPA
September 2012	GHD	Targeted threatened species survey of the MTPA
February 2012	GHD	Baseline wet season flora and fauna survey of the MTPA
November 2011	GHD	Baseline dry season flora and fauna survey of the MTPA
May 2011	GHD	Targeted threatened species survey of the MTPA
1990	NSP	Terrestrial vertebrate fauna survey of the Mount Todd – Yinberrie Hills area

2. Existing Environment

2.1 Conservation Values of the Region

Regionally, areas of conservation value includes Nitmiluk (Katherine Gorge) National Park to the east, Kakadu National Park to the northeast and northwest to near Pine Creek.

The MTPA is located within the Yinberrie Hills Site of Conservation Significance (SOCS). The Yinberrie SOCS is an area identified by Department of Environment and Natural Resources (DENR) (formerly DLRM, NRETAS) as a site of conservation significance extending roughly from the Nitmiluk National Park in the east, encompassing the Yinberrie Hills to the west. A number of sites within the Yinberrie Hills SOCS are included on the Register of the National Estate (RNE) for their biological and ecological values. The designation of the area as a SOCS is largely based on the presence of threatened fauna and their habitats. Ecological values include persistent use of the area by relatively large numbers of the endangered Gouldian finch (*Erythrura gouldiae*), and the presence of the largest known breeding population of the species.

Edith River is located to the south of the mine site and runs from the east to the west. The MTPA is located within the Edith River Beneficial Use Area. The Edith River Beneficial Use Area was declared with the objective to sustain the aquatic ecosystem of the River. The MTPA is downstream of Leliyn (Edith Falls) which is a popular swimming and camping area along the Edith River within the Nitmiluk National Park.

The NT Land Clearing Guidelines (2010) identify a number of sensitive or significant vegetation types in the NT including rainforests, monsoon vine thicket, riparian or closed forests. The riparian forests along the Edith River and along Stow Creek meet these criteria, and are thus considered to be of regional conservation value

The conservation values of the region are illustrated in FIGURE 2-1: CONSERVATION VALUES OF THE REGION.

2.2 Vegetation

2.2.1 Bioregion

MTPA is located in the Pine Creek Bioregion. It is a region of mostly foothills located west of the western Arnhem Land sandstone massif. It is dominated by Darwin stringybark (*Eucalyptus tetrodonta*) and Darwin woollybutt (*E. miniata*) open forest, eucalypt woodlands, riparian vegetation and some patches of monsoon thicket. Vegetation in the Pine Creek bioregion is well conserved with at least 12,124km2 or 42.6% of the region under conservation management in parks and reserves. This includes large areas in Kakadu, Nitmiluk, Litchfield and Mary Rivers National Parks.

2.2.2 Native Vegetation

The native vegetation communities recorded within mine site include:

- *Melaleuca* forest, with bare areas (Vegetation type 1);
- *Eucalyptus bigalerita*, E. spp. open forest (Vegetation type 2);

- *Eucalyptus tintinnans*, *E.* spp.*, Erythrophleum chlorostachys* woodland (Vegetation type 4);
- *Eucalyptus tintinnans*, *C. dicromophloia* woodland (Vegetation type 6);
- *Eucalyptus tectifica* woodland (Vegetation type 9);
- *Eucalyptus tectifica*, *Corymbia confertiflora* woodland (Vegetation type 10);
- *Corymbia latifolia*, *Eucalyptus bigalerita* open-woodland with areas of grassland (Vegetation type 11); and
- *Eucalyptus tectifica* woodland / *E. tintinnans*, E. spp., *Erythrophleum chlorostachys* woodland (Vegetation type 16).

The footprint of MTPA covers 1267 Ha of which approximately 889 Ha (16 %) of the natural vegetation in the MTPA has been cleared and a further 110 Ha has been modified. The 609 ha of remnant native vegetation that will be impacted by the mine consists of five vegetation types (FIGURE 2-2: VEGETATION TYPES ACROSS THE MINE SITE.). These include:

- 96 Ha of *E. bigalerita*, *E. spp.* open forest (Vegetation type 2)
- 57 Ha of *E. tintinnans*, *E. spp*., *Erythrophleum chlorostachys* woodland (Vegetation type 4)
- 83 Ha of *E. tintinnans*, *E. dichromophloia* woodland (Vegetation type 6)
- 295 Ha of *E. tectifica* woodland (Vegetation type 9)
- 78 Ha of *Corymbia latifolia, E. bigalerita* open-woodland with areas of grassland (Vegetation type 11).

The *E. tintinnans* woodlands (Vegetation types 4 and 6), is known to provide habitat for a significant breeding population of the Gouldian finch.

Figure 2-1: Conservation values of the region.

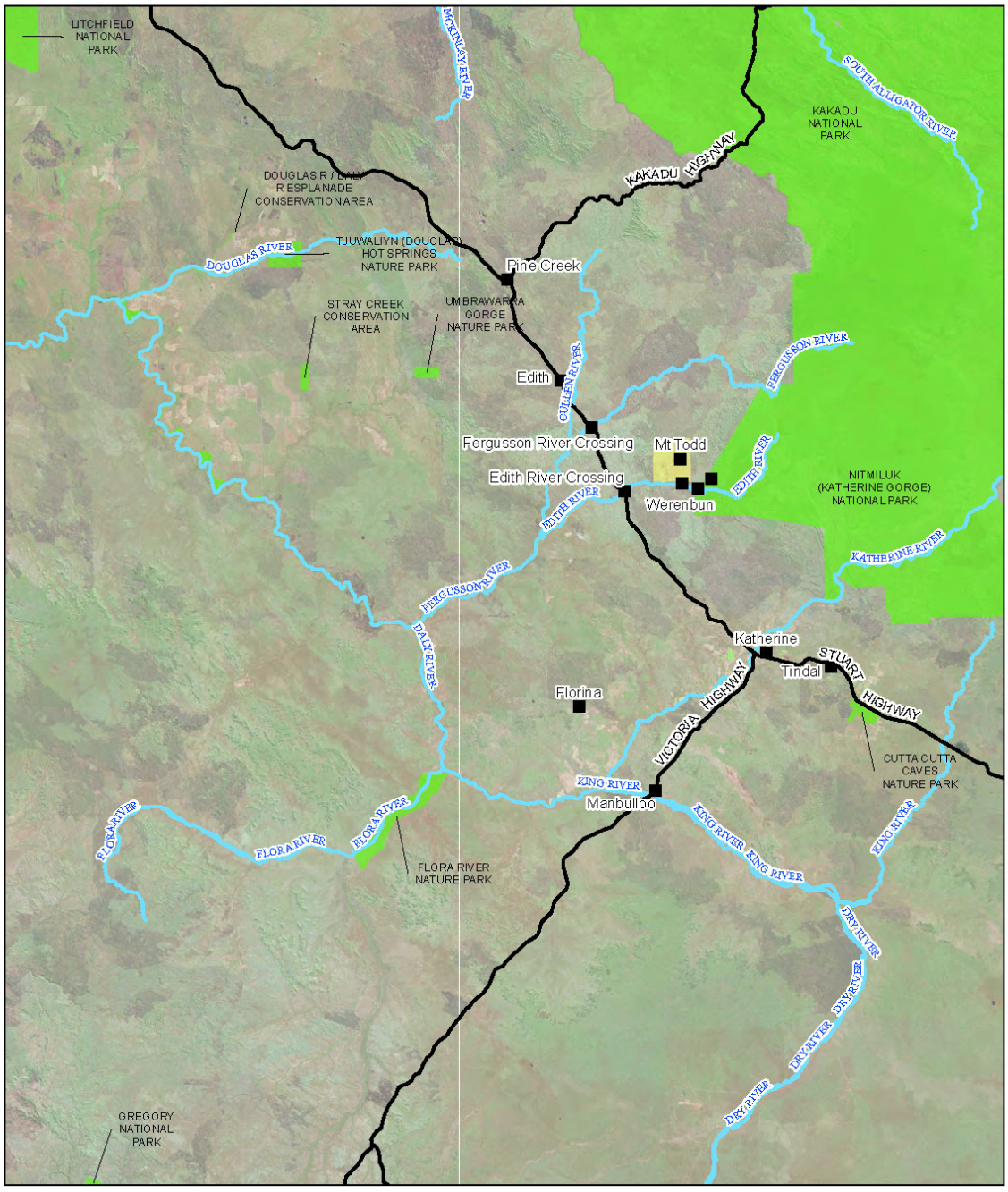
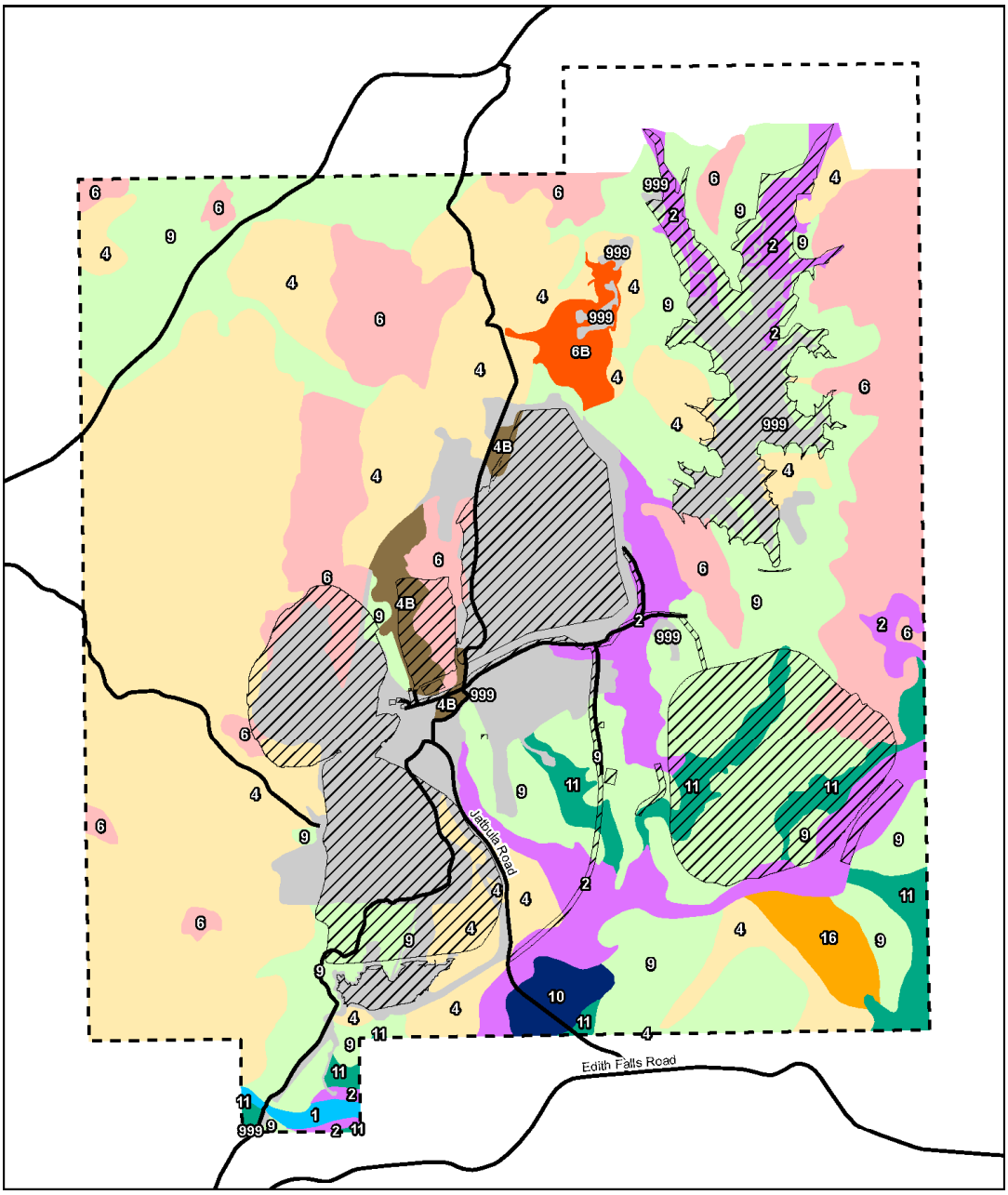


Figure 2-2: Vegetation types across the mine site.



2.2.3 Flora

The flora survey of MTPA undertaken in 2011/12 identified 959 species across 226 taxa. The Fabaceae (pea family, 159 species), Poaceae (grass family, 150 species) Cyperaceae (sedge family, 95 species) and Myrtaceae (myrtle family, 59 species) were the most species-rich families recorded). Flora species recorded within MTPA and their associated vegetation communities are relatively common in the region with the exception of a few species.

One NT threatened flora species (*Utricularia singeriana*) is known or predicted to occur in the locality but has not been recorded within the MTPA.

One flora taxon of regional significance has been recorded on the MTPA. This species (*Fimbristylis fimbristyloides*) is endemic to the Pine Creek Bioregion and is associated with the *E. tintinnans*, *E. spp*., *Erythrophleum chlorostachys* woodland (Vegetation type 4) (FIGURE 2-2: VEGETATION TYPES ACROSS THE MINE SITE.).

A full list of all species recorded within the MTPA is detailed in the Flora and Vegetation Assessment (EIS - Appendix M).

2.2.4 Threatened flora species

Threatened flora species are those that are listed under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* and/or Northern Territory's *Territory Parks and Wildlife Conservation* (TPWC) *Act 2000*.

Utricularia singeriana, which is known or predicted to occur in the locality of the MTPA, is listed as Vulnerable under the TPWC Act. It occurs along seasonally waterlogged margins of drainage lines with sparse short grasses and sedges. The NT Government flora records indicate a record of this species from approximately 6 km west of the western border of the MTPA. The location of this *U. singeriana* record is a seasonally inundated drainage line with low granite outcropping at the upper reaches of Vegetation type 11 where it intersects with Vegetation type 8.

Areas in the mine site with similar characteristics have been mapped as potential *U. singeriana* habitat (Figure 2-2). Suitable habitat was identified marginally, outside the upper reaches of Vegetation type 11 where it intersects with Vegetation type 9.

Targeted searches for *U. singeriana* have been undertaken in these areas, however no individuals or populations of this species have been identified. The species is cryptic and can only be identified when in flower (usually for a short period between March and May). Therefore, not finding this species does not discount its presence within the MTPA.

Terrestrial Fauna

2.2.5 Habitat Values

Three main fauna habitats are present within the MTPA including:

- Hillside woodland;
- Lowland woodlands; and
- Riparian zones.

Areas of *Eucalyptus* and *Melaleuca* woodland in riparian zones have higher species richness than other sites, particularly during the dry season. The lowest species diversity is associated with open

Eucalyptus tintinnans, E. spp., Erythrophleum chlorostachys woodland and *E. tectifica/E. tintinnans, E. spp*., and *Erythrophleum chlorostachys* woodland.

Fauna species richness corresponded strongly with the occurrences of fire, with areas having evidence of recent fire tending to have significantly lower species richness than areas where fire occurred in the more distant past. Canopy height is the next most influential habitat variable with areas with taller trees tending to have higher species richness.

2.2.6 Fauna

The desktop assessment revealed records of 300 native terrestrial vertebrate species from within 10 km of the MTPA. These include

- 36 species of mammal;
- 183 species of bird;
- 67 species of reptile; and
- 14 species of amphibian.

A total of 216 native terrestrial fauna species have been recorded within the MTPA.

Thirty-one species of mammal have been recorded during surveys, including four species of non-native mammals. Mammals recorded comprised the following ecological/morphological/taxonomical sub-groups:

- Bats – black flying-fox (*Pteropus alecto*) and up to 18 species of micro-chiropteran bats (insectivorous bats);
- Large carnivores – dingo (*Canis lupus dingo*);
- Macropods – agile wallaby (*Macropus agilis*), antilopine wallaroo (*Macropus antilopinus*), euro (*Macropus robustus*);
- Small ground mammals – common planigale (*Planigale maculata*), delicate mouse (*Pseudomys delicatulus*), pale field-rat (*Rattus tunneyi*), western chestnut mouse (*Pseudomys nanus*); and
- Non-native mammals – swamp buffalo (*Bubalus bubalis*), cattle (*Bos indicus*), donkey (*Equus asinus*), pig (*Sus scrofa*) and horses (Equus caballus).

One hundred and twenty species of bird (all native) have been recorded during surveys. Birds recorded comprised the following ecological/morphological/taxonomical sub-groups:

- Finches – five species of small granivorous finches;
- Parrots/cockatoos – nine parrots, rosellas, cockatoos, corellas, lorikeets, cockatiel, galah;
- Raptors – twelve falcons, goshawks, eagles, kites, baza and buzzard;
- Cuckoos – four, mostly seasonal species of cuckoo;
- Woodland birds – fifty-six species generally associated with treed habitats, including honeyeaters, cuckoo-shrikes, doves, warblers, babblers, and flycatchers;
- Ground birds – large and small species of birds (eight) that tend to remain on or near the ground (e.g., bustard, brolga, quail, stone-curlew, coucal, cisticola and fairy-wren);

- Waterbirds – twenty one species that show a strong association with ponds, lakes, swamps, water courses or riparian habitats, includes grebes, herons, egrets, ducks and geese, gallinules, ibis, shorebirds, pelican, stork and azure kingfisher; and
- Night birds – five owls, frogmouths, nightjars and owlet-nightjar.

Forty-five species of reptile (all native) species of bird (all native) have been recorded during surveys. Reptiles recorded comprised of ecological/morphological/taxonomical sub-groups that include crocodiles, dragons (agamids), geckoes, monitors (varanids), pygopods (legless lizards), skinks and snakes.

Twenty species of amphibian have been recorded during surveys. Amphibians recorded comprised the following ecological/morphological/taxonomical sub-groups:

- Burrowing frogs – All frogs that burrow during the dry season, mainly comprising the Myobatrachid (southern frogs) genera *Uperoleia*, *Limnodynastes*, *Platyplectrum* and *Notaden*, also including the genus *Cyclorana*, which shares characteristics of Myobatrachidae and Hylidae (tree frogs);
- Ground frogs – Mainly ground hylids (i.e. 'tree frogs' with poorly developed toe-pads, such as *Litoria inermis* and *Litoria wotjulumensis*), one Myobatrachid (*Crinia remota*) and the non-native cane toad (*Rhinella marina*); and
- Climbing frogs – Arboreal hylids with well-developed toe-pads (e.g. *Litoria caerulea*, *Litoria rothii*).

A full list of all species is recorded within the mine site is detailed in the Terrestrial Fauna Assessment (Appendix N of the EIS).

2.2.7 Threatened species

Threatened fauna species are those that are listed as threatened (or a related category) under the Commonwealth EPBC Act and/or Northern Territory's TPWC Act.

Eighteen threatened fauna species that have been confirmed to occur or potentially occur within the mine site include:

- Six mammals;
- Eight birds;
- Three reptiles; and
- One fish.

Six of the eighteen threatened species have been recorded in the mine site during field assessments undertaken in 2011/12 and 1990 (Figure 2-3). The location and habitat requirements for the six threatened species identified within the mine site are detailed below.

Gouldian finch

The Gouldian finch nests in hollows in salmon gum (*E. tintinnans*) during the dry season. The nests are found on rocky hillsides. A cup shaped nest of grass is built in hollows created by termite activity, and clutches of 3-8 eggs are laid between January and August, with a peak in April. Breeding coincides with peak resource availability and up to three clutches can be produced per season.

The birds feed predominantly on the seed of a native sorghum (*Sarga timorense*) during the nesting period. This food source declines as the late Dry Season approaches and the finches turn to a series of late Dry Season to late Wet Season seeding grasses for food. These, in approximately the order of seeding, are cockatoo grass (*Alloteropsis semialata*), golden beard grass (*Chrysopogon falax*), curly

spinifex (*Triodia bitextura*) and giant speargrass (*Heteropogon triticeus*). Cockatoo grass and golden beard grass are relatively common in the western areas of the mine site while sorghum is more abundant in the east.

The Gouldian finch is well known to have a major breeding area in the Yinberrie Hills. Nesting occurs in the Yinberrie Hills to the west of the Batman Pit (FIGURE 2-3: RECORDS OF THREATENED FAUNA WITHIN THE MTPA). Individuals have also be recorded in the areas to the south of the MTPA, along Edith River, and are also associated with the Yinberrie Hills population.

Australian bustard

The Australian bustard typically occurs in open habitats, preferring grasslands, low shrublands, grassy woodlands and other structurally similar but artificial habitats such as croplands and airfields. This species responds favourably to fire and is often located in recently burnt habitats, including woodlands.

The Australia bustard has been recorded in areas that were created during previous mining i.e. disturbed areas that are open with little vegetation. Individuals have been recorded at the Waste Rock Dump and Heap Leach Pad (FIGURE 2-3: RECORDS OF THREATENED FAUNA WITHIN THE MTPA).

Pale field-rat

The pale field-rat is found in high rainfall areas of the northern Australia ranging from the Kimberley to south eastern Queensland. It was once a widespread species found in dense vegetation along creeks. The pale field-rat is nocturnal, sheltering in extensive shallow burrows during the day and form loose colonies.

The pale field-rat has been recorded adjacent to creek lines within the mine site including upstream of the West Creek access road crossing on Edith River and the Jatbula Road crossing on Stow Creek.

Painted honeyeater

Painted honeyeaters are the most specialised honeyeaters, being almost wholly dependent on mistletoe fruits, but may also feed on nectar and insects. They inhabit woodlands and open forest and prefer habitats with more mature trees since these host more mistletoe.

The painted honeyeater has a broad distribution in eastern Australia but is nowhere very numerous. Most breeding occurs in the inland slopes of south eastern Australia, and non-breeding birds move widely out into semi-arid and northern regions. There is no evidence of a breeding population in the NT and the records are thought to be of irregular visitors from the southeast (though it is possibly a regular visitor in small numbers).

This species was recorded once within the mine site at a location along the northern access road and approximately 1 km to the north of the TSF1 (FIGURE 2-3: RECORDS OF THREATENED FAUNA WITHIN THE MTPA Figure 2-3). This is just the second record for this species in the Katherine area, with the majority of the very few known records coming from the eastern parts of the Top End.

Mertens' water monitor

The Mertens' water monitor is a semi-aquatic monitor seldom seen far from water. It is found occupying coastal and inland waters across the far north of Australia from the Kimberley to the west side of Cape York Peninsula. These species of monitor (goanna) are known to exhibit population decline following cane toad invasion but are known to persist and recover.

The Mertens' water monitor has been recorded at the Tollis Pit, in the vicinity of the Mount Todd Mine workshop and in the RWD (FIGURE 2-3: RECORDS OF THREATENED FAUNA WITHIN THE MTPA).

Crested shrike-tit (northern)

The Crested shrike-tit is believed to prefer open mixed woodland with grassy understorey, on heavy soils shallowly inundated for much of the wet season. This habitat type is patchily distributed in the area surrounding TSF2 and closer to the Edith River.

The very few records of the Crested shrike-tit, and the presence of a relatively small area of potentially suitable habitat in the lower lying areas and elsewhere in the Yinberrie Hills suggest that this species may visit occasionally or be a rare resident of the MTPA.

Two unconfirmed detections of Crested shrike-tit within the Mine site have been made and in both instances the birds were heard but not seen. The possible detections were made at the Jatbula Road crossing on Stow Creek and south-eastern boundary of the MTPA (FIGURE 2-3: RECORDS OF THREATENED FAUNA WITHIN THE MTPA).

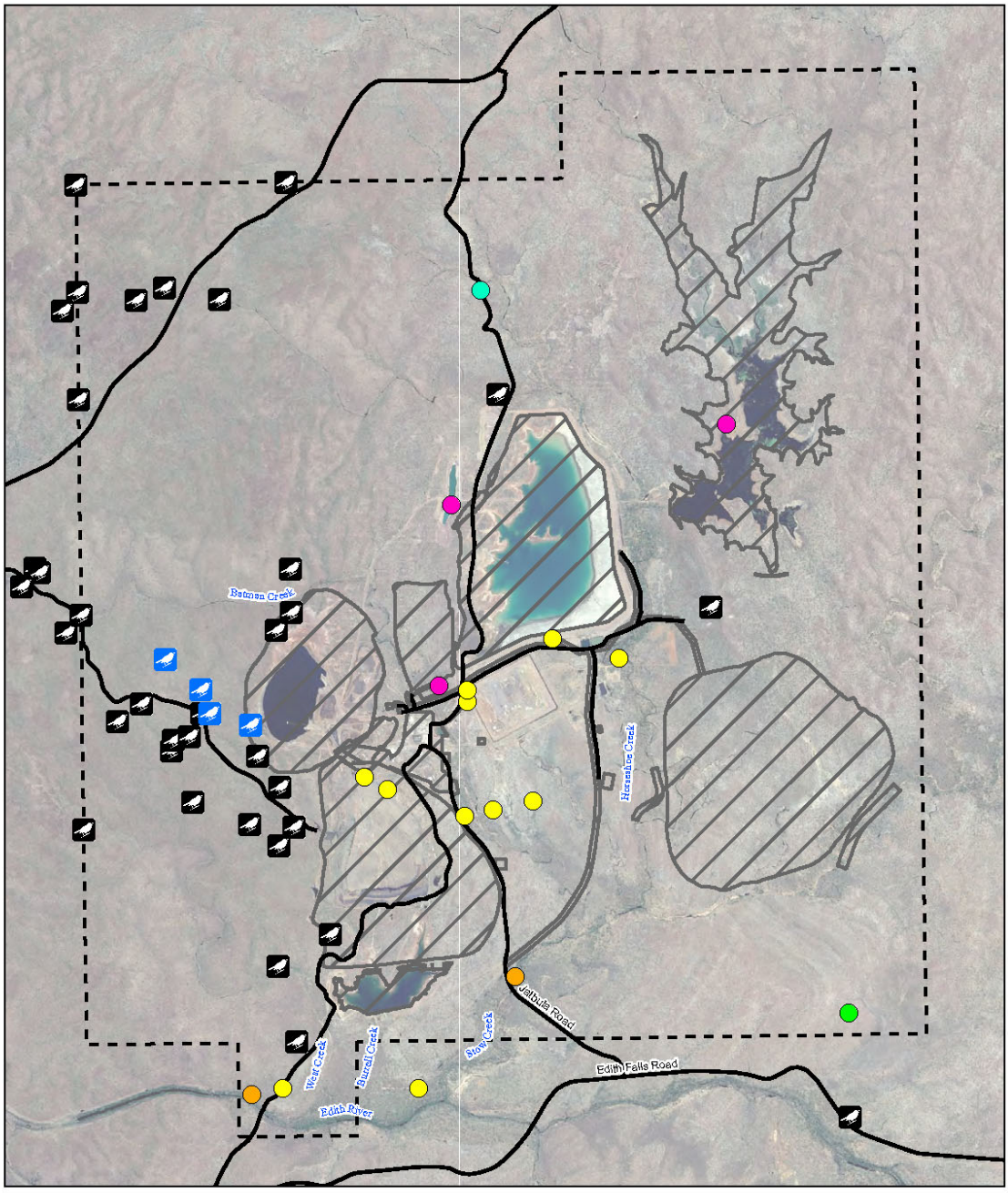
Northern Quoll

The Northern Quoll (*Dasyurus hallucatus*) is listed as Endangered under the EPBC Act and Critically Endangered under the TPWC Act. The species was formerly widespread across northern Australia in a range of habitat types, however populations have dramatically declined with an estimated 95% reduction in their range between 1980 and 2010 and the species is locally extinct across much of the NT mainland (DoEE 2017). The causes of the decline of the species are complex and not fully understood but can be broadly attributed to the impacts of cane toads, feral cats, inappropriate grazing and fire regimes (Hill and Ward 2010).

The species is a habitat generalist, having been recorded in a wide range of communities. Individuals have been recorded tree hollows, rock crevices, logs, termite mounds and goanna burrows (Oakwood, 1997). The recovery plan for the species identifies rocky habitat as critical to their mainland survival as these habitats provide a combination of suitable denning sites, access to water, microhabitat diversity, high vegetation productivity and diversity and associated high prey availability rocky sites may ameliorate the effects of fire and of hunting pressure from introduced predators (Hill and Ward 2010).

SLR Consulting undertook a habitat survey of the MTPA for the Northern Quoll in October 2017 assessing suitability for denning. Although potential den sites for Northern Quolls can include temporarily available habitats (e.g. tree hollows, logs, termite mounds etc), the survey focused on permanently available rocky habitat – both because the potential time elapsed between this survey and the required pre-clearance survey means the availability of temporary sites may have changed, and, more importantly, because rocky habitats provide better denning sites, which are more likely to be used

Figure 2-3: Records of threatened fauna within the MTPA



2.2.8 Pests

The cane toad (*Bufo marinus*) has been recorded within the MTPA and is the most commonly recorded amphibian. The cane toad is listed as 'invasive' and implicated in a Key Threatening Process under the EPBC Act.

There are also historic records of feral cattle (*Bos taurus*), water buffalo (*Bubalus bubalis*), donkeys (*Equus asinus*) and horses (*Equus caballus*) within the mine site. Feral pigs (*Sus scrofa*) are also known to roam the area as indicated by old wallows and 'rooting' evident in low lying areas. Additional exotic species included in the NT Fauna Atlas are the black rat (*Rattus rattus*) and feral cat (*Felis catus*).

Under the EPBC Act, threat abatement plans establish a national framework to guide and coordinate Australia's response to key threatening processes. The plans identify research, management and other actions needed to ensure the long-term survival of native species and ecological communities affected by key threatening processes. Threat abatement plans directly relevant to fauna at the mine include:

- Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads – 2011; and
- Threat abatement plan for predation by feral cats – 2015.

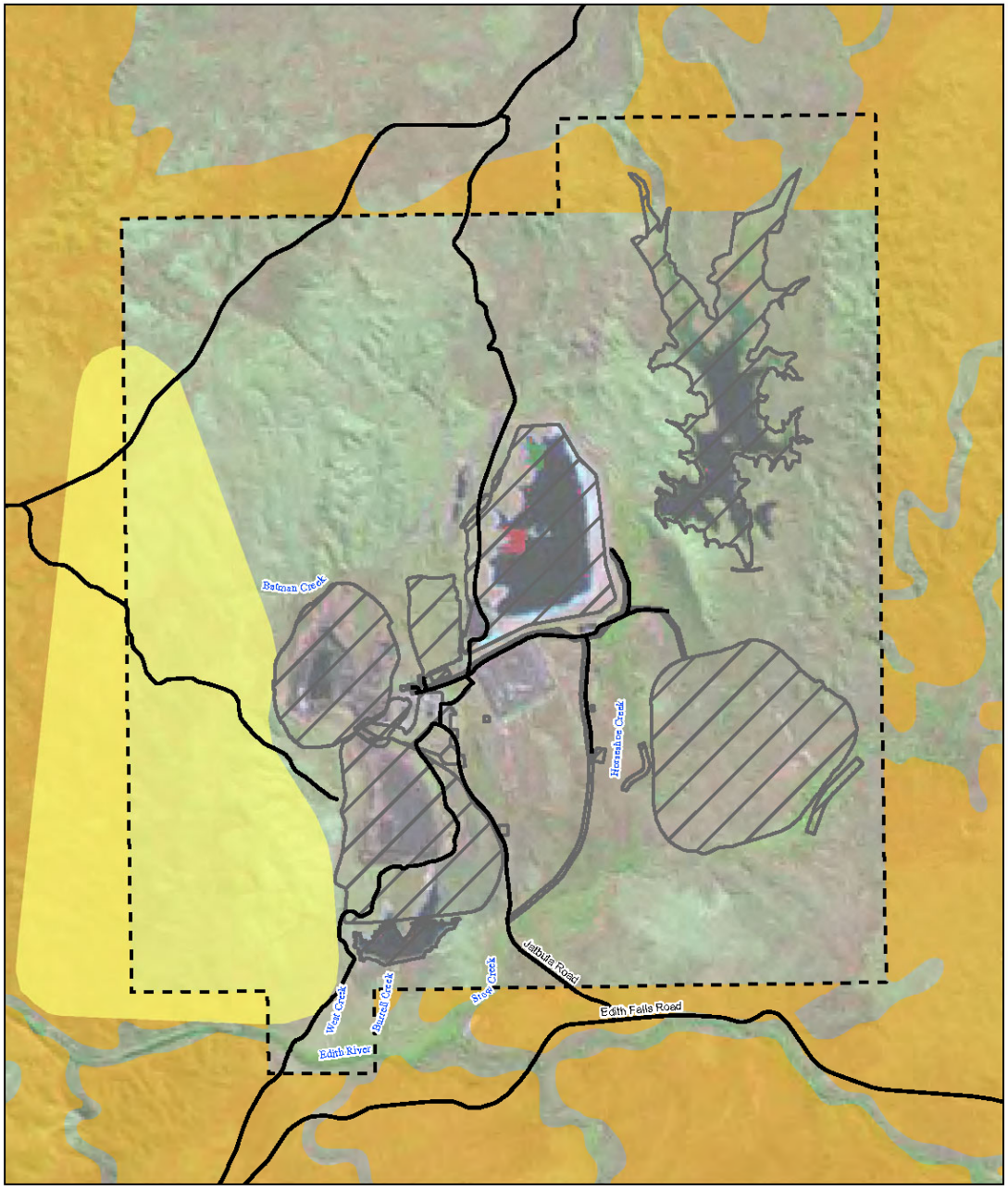
2.3 No-go zones

No-go zones acknowledge the presence and significance of ecological and or cultural heritage values within the mine site. No-go zones include:

- Gouldian finch core breeding habitat, outside what has been included in the EPBC Approval for a Controlled Action;
- Potential habitat for *Utricularia singeriana*; and
- Cultural heritage and sacred sites.

The no-go zones for the mine site are illustrated in FIGURE 2-4: No-go zones for the mine site. Activity, including access, within these areas is restricted.

Figure 2-4: No-go zones for the mine site.



3. Flora and Fauna Management

The general approach for management of biodiversity before, during and after mine construction and operations is as follows:

- **Key Activities, Risks and Impacts:** A summary of the key activities being undertaken during the management period. The potential environmental impacts and residual risk levels are identified for each environmental aspect.
- **Objective:** The guiding environmental management objective(s) and activities that apply to the element.
- **Mitigation Measures:** The procedures to be employed to ensure that the relevant objectives are met.
- **Trigger, Action, Response Plan (TARP)**. The actions to be implemented in the case of non-compliance. This includes strategies of remediation and the person(s) responsible for the actions.

3.1 Key Activities, Risks and Impacts

The key activities and potential impacts to flora and fauna are provided in TABLE 3-1 KEY ACTIVITIES, RISKS AND IMPACTS. The residual risk level identified is the risk remaining once management and mitigation measures are implemented. The risk matrix is provided in Attachment A.

Table 3-1 Key Activities, Risks and Impacts

Activity	Potential Environmental Impact	Residual Risk Level		
Vegetation clearing during construction and operation	Modify or inhibit ecological processes	High	Unlikely	Low
	Reduce the diversity or modify the composition of plant species			
	Damage habitat important for the conservation of biological diversity			
Introduction of weed species onto site and / or spread of existing weeds into new areas	Modify or inhibit ecological processes	High	Unlikely	Low
	Reduce the diversity or modify the composition of plant species			
	Fragment or damage habitat important for the conservation of biological diversity			
Elevated levels of dust from mining operations	Modify or inhibit ecological processes	High	Unlikely	Low
	Reduce the diversity or modify the composition of plant species			
	Damage habitat important for the conservation of biological diversity			

Activity	Potential Environmental Impact	Residual Risk Level		
	Cause a long term reduction in rare, endemic or unique plant populations or species			
	Fragment, isolate or substantially damage habitat for rare, endemic or unique plant species			
Clearing of individuals or habitat of *Utricularia singeriana* (threatened) or *Fimbrostylus fimbrostyoloides* (endemic)	Cause a long term reduction in rare, endemic or unique plant populations or species	Minor	Unlikely	Very Low
	Fragment, isolate or subsequently damage habitat for rare, endemic or unique plant populations or species			
Cumulative impacts of clearing, dust, noise, wildfire, exotic animals and plants, tailings dam water and artificial light on the Gouldian finch	Long-term decrease in the size of the population	Major	Possible	High
	Reduce the area of occupancy of the species			
	Adversely affect habitat critical to the survival of the species			
	Fragment an existing population into two or more populations			
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline			
	Result in invasive species that are harmful to the Gouldian finch			
	Introduce a disease that may cause the species to decline			
	Interfere with recovery of the species			
Cumulative impacts of clearing, dust, noise, wildfire, exotic animals and plants and artificial light on the threatened species. Species known to be in area: Mertens' water monitor Species with potential to be in area (but not known): crested	Long-term decrease in the size of the population	Minor	Unlikely	Very Low
	Reduce the area of occupancy of the species			
	Adversely affect habitat critical to the survival of the species			
	Fragment an existing population into two or more populations			
	Modify, destroy, remove, isolate or decrease the availability or quality of			

Activity	Potential Environmental Impact	Residual Risk Level		
shrike-tit and partridge pigeon, Australian bustard, painted honeyeater and pale field-rat, Mitchell's water monitor and yellow-spotted monitor	habitat to the extent that the species is likely to decline			
	Result in invasive species that are harmful to the shrike-tit			
	Introduce a disease that may cause the species to decline			
	Interfere with the recovery of the species			
Cumulative impacts of clearing, dust, noise, wildfire, exotic animals and plants, artificial light and channel diversion on the fauna / aquatic fauna of the Site of Conservation Significance (SOCS #30) (Yinberrie Hills)	Modify ecological processes	Major	Unlikely	Medium
	Reduce the diversity or modify the composition of animal species Cause a long-term reduction in rare, endemic or unique animal species			
	Fragment or damage habitat important for the conservation of biological diversity			
Fauna utilising water from the tailings dam and other water storage facilities.	Poisoning or mortality of fauna	Moderate	Rare	Very Low
Vehicular traffic across the mine site.	Morality of fauna from vehicle incident	Minor	Possible	Low

3.2 Objective

General management objectives for flora and fauna pertaining to overarching biodiversity values and ecosystem health are detailed in Table 3-2.

Table 3-2 General Flora and Fauna Management Objectives

Objective	Target	Indicator
Establish and maintain awareness and importance of protecting biodiversity across the mine.	All onsite personnel (including Contractors) to undertake site induction that will include a summary of the mine biodiversity.	Percentage of personnel who completed the site induction.
Establish and maintain awareness and importance of protecting biodiversity across the mine.	All onsite personnel (including Contractors) to undertake site induction that will include a summary of the mine biodiversity.	Percentage of personnel who completed the site induction.
Minimise the extent of vegetation clearance and undertake in	Zero incidents of unapproved vegetation clearing.	Number of incidents of clearing outside of approved clearance areas.

Objective	Target	Indicator
accordance with the Ground Disturbance Permit system.		
Minimise injury or death to native fauna from mine activities.	All vehicles to adhere to established mine speed limits.	Number of incidents of speeding.
	Zero incidents of native fauna injury or death from mine activities.	Number of incidents involving native fauna injury or death from mine activities.
Minimise introduction of new pest or weed species or increase in existing populations.	No increase in the existing pest or weed populations (i.e. rabbits, cats, cane toads, pigs and buffalo).	Number of new declared pests or weeds.
		Percentage increase in population sizes, or increase in weed affected areas
Minimise likelihood of poisoning to fauna utilising tailing dam.	Zero incidents of fauna mortality from poisoning.	Number of mortalities.

As outlined in section 2.2.7, of the eighteen fauna species that are listed threatened species under the Commonwealth EPBC Act and/or Northern Territory's TPWC Act, only six have been confirmed as occurring within the mine site. Flora and fauna management objectives specific to these six species are detailed in Table 3-2.

Table 3-3 Specific Flora and Fauna Management Objectives

Objective	Target	Indicator
Minimise disturbance to the Gouldian finch population associated with Yinberrie Hills.	No significant long-term reduction in Gouldian finch population.	Refer to the GFMMP.
Minimise disturbance to the Australian Bustard population associated with the Waste Rock Dump and Heap Leach Pad.	No significant long-term reduction in Australian Bustard population.	Presence/absence and relative abundance of Australian Bustard.
Minimise disturbance to Painted Honeyeaters and associated habitat on Northern Access Road.	Maintain current level of ecosystem health within woodland and open forest areas, where possible.	Decrease in the size and health of existing woodland and open forest vegetation types.

Objective	Target	Indicator
Minimise disturbance to Pale field-rats and associated habitat in riparian areas.	No significant long-term reduction in Pale field-rat population.	Presence/absence and relative abundance of Pale field-rats.
	Minimal disturbance to creek lines, water bodies and riparian vegetation.	
Minimise disturbance to Mertens' water monitors and associated habitat in riparian areas.	No significant long-term reduction in Mertens' water monitor population.	Presence/absence and relative abundance of Mertens' water monitors.
	Minimal disturbance to creek lines and riparian vegetation.	
Minimise disturbance to Crested shrike-tits and associated mixed woodland habitat.	Maintain current level of ecosystem health within mixed woodland areas, where possible.	Decrease in the size and health of existing mixed woodland vegetation types.
Minimise disturbance to *Utricularia singeriana* and associated riparian and ephemeral drainage line habitat.	Minimal disturbance to creek lines, water bodies and riparian vegetation.	Decrease in the size and health of existing riparian and ephemeral drainage line vegetation types.

The other twelve (12) listed threatened species, which have not been confirmed to occur within the mine site, but with some likelihood of occurrence, will not have detailed management strategies implemented. All mine staff will be undergo training on the identification and habitat of these species, and if and when they are observed within the mine-site, appropriate management objectives and subsequent strategies will then will be initiated.

3.3 Mitigation measures

Mitigation measures have been developed to minimise potential impacts associated with biodiversity and listed threatened species. The mitigation measures, appropriate timing and assignment of responsibilities are provided in Table 3-4.

3.4 Trigger, Action and Response Plan

The Trigger, Action and Response Plan (TARP) outlines remedial actions and responses to the situation. The TARP is provided in ***Table 3-5 Trigger, Action and Response Plan***

Table 3-4 Mitigation Measures

ID	Mitigation Measures	Timing	Responsibility
General			
FL1	Site induction will include the following components for biodiversity management: • Summary of biodiversity at the mine including ecologically sensitive areas (i.e. no-go zones) and threatened fauna; • Requirement of all staff to report sightings of threatened fauna; • Identification of potential impacts to biodiversity from the mine activities; • Requirement for speed restrictions across the mine; and • No work to be undertaken without an approved Ground Disturbance Permit (**Attachment L2**).	Prior to work commencing	Environment Manager
FL2	Implement all aspects of the Environmental Management Plan including the following sub-plans: • Flora and Fauna Management Plan (this plan); • Air Quality Management Plan (Appendix I to the MMP); • Noise, Vibration and Light Management Plan (Appendix O to the MMP); • Fire Management Plan (Appendix K to the MMP); • Weed Management Plan (Appendix J to the MMP); and • Mine Closure Plan (Appendix R to the MMP).	At all times	All personnel
FL3	Access restrictions to Gouldian finch habitat including: • Access to water holes will be restricted. • Known locations and habitat areas of the Gouldian finch have been mapped and access to these areas will be by authorisation only.	At all times	All personnel
FL4	All employees and contractors will also be informed of new Gouldian finch management requirements as they emerge via email, signs, informal meetings, toolbox talks and staff meetings.	At all times	Environment Manager
	Access to creeks, water bodies and surrounding riparian vegetation will be restricted to nominated buffer width to eliminate disturbance to Pale field-rat, Mertens' water monitor and *Utricularia singeriana* populations and their associated habitat.	At all times	All personnel

ID	Mitigation Measures	Timing	Responsibility
Vegetation Clearing			
FL5	Adhere to buffer widths recommended by the Northern Territory Land Clearing Guidelines, where possible, with regard to riparian vegetation in drainage lines. If not possible install structures that would capture sediment downstream of development.	At all times	Environment Manager
FL6	Stage clearing of vegetation to minimise areas of bare ground and clear land only as required and in accordance with ESCP.	Prior to work commencing	Environment Manager
FL7	All vehicle parking, laydown areas and temporary materials stockpiles and other temporary facilities are located within existing hardstand areas or previously cleared sites and that environmental discharges from these areas are contained, controlled and monitored.	During construction	Environment Manager
FL8	Individual trees with high Gouldian finch habitat value (i.e. *Eucalyptus tintinnans* containing potential breeding hollows) within areas marked for clearing will be retained, where possible.	Prior to vegetation clearing	Environment Manager
FL9	Replace removed tree hollows with high quality artificial hollows.	Prior to vegetation clearing	Environment Manager
FL10	Clearing of known Gouldian finch breeding habitat (incl. *Eucalyptus tintinnans* woodlands adjacent to the pit) can only occur outside of the breeding season, i.e. September through to February. However, clearing of wet season foraging habitat should occur during the breeding season, i.e. undertaken from March to August.	At all times	Environment Manager
	Where possible, minimize disturbance to woodland, mixed woodland and open forest vegetation types, particularly areas associated with Jatbula Road Crossing at Stow Creek and on the Northern Access Road (Crested shrike-tit and Painted honeyeater habitat)	At all times	All personnel
FL11	Adopt and implement a Ground Disturbance Permit system.	At all times	All personnel
FL12	Avoid land clearing for construction during the Wet Season (Dec-May).	At all times	All personnel

ID	Mitigation Measures	Timing	Responsibility
FL13	Fence no-go zones identified as habitat for threatened flora species (***Figure 2-4: No-go zones for the mine site***).	Prior to work commencing	Environment Manager
FL14	Targeted survey by botanist if no-go zones identified as habitat for threatened flora species proposed for vegetation clearing. A botanist must review and approve the Ground Disturbance Permit (**Attachment L-2**).	Prior to work commencing	Environment Manager
FL15	Onsite assessment for threatened flora species to be included in Ground Disturbance Permit form (**Attachment L-2**).	At all times	All personnel
FL16	Relocation procedure to be implemented if threatened flora to be destroyed e.g. collect seeds, relocate plants if practicable.	Prior to work commencing	Environment Manager
FL17	Pre-clearing survey to be undertaken by qualified / specialist ecologist and: • Salvage individuals of Northern quoll and relocate to pre-arranged recovery area • Avoid all activity in areas of active nesting for Crested shrike-tit and Painted honeyeater until nest is abandoned or young fledge • Relocate any Bare-rumped sheathtail bats	Prior to vegetation clearing	Environment Manager
FL18	Any areas outside those required that are inadvertently cleared or disturbed will be rehabilitated (in addition to reporting breaches in accordance with the notification of breach procedures)	As required	Environment Manager
FL19	Implement a revegetation plan prior to creek diversion to suit the physical characteristics and requisite environmental values of the waterway. Consider fish passage in the design and provide sufficient depth, velocities and resting habitat in the diversion design for regular flow events.	During construction	Environment Manager
FL20	Clearing of vegetation will be monitored daily during clearing activities to ensure no intrusions occur.	During vegetation clearing	Environment Manager
Weeds			
FL21	Imported fill to be certified weed-free prior to being utilised at the mine.	At all times	All personnel

ID	Mitigation Measures	Timing	Responsibility
FL22	All vehicles entering and exiting the mine site are to be jet washed to remove potential seeds.	At all times	All personnel
FL23	Weed control to be implemented annually as detailed in the Weed Management Plan.	At all times	Environment Manager
FL24	Annual weed monitoring to be completed by an appropriately experienced and qualified person (monitoring will establish potential requirements for control activities for the following year).	At all times	Environment Manager
FL25	If works are being undertaken in an area known to contain weeds of national significance or Class A, B or C weeds, plant/equipment and vehicles are to be washed prior to vacating the areas.	At all times	All personnel
Air Quality			
FL26	Stabilisation of surface silt content through application of localised chemical dust suppressants (suitable for access roads which are traversed less frequently).	At all times	Site Manager
FL27	Water carts will operate across the mine during construction and operation. Watering rate of 2L/m^2/application to all haul roads.	At all times	Site Manager
FL28	Speed limits will be enforced surrounding Jatbula Road crossing on Stow creek and on the Northern Access Road to minimize effects of dust on surrounding Crested shrike-tit and Painted honeyeater habitat.		
FL29	Defined access roads and haul routes to be used.	At all times	Site Manager
FL30	Stockpiles of soils across the mine will be managed to reduce dust emission including spraying with water, covering or the application of surface veneers (surfaces static for an extended period).	At all times	Site Manager
FL31	Retention of vegetation around the boundary as a buffer, and to limit potential dust sources.	At all times	Site Manager
FL32	Minimising exposed subsoil through progressive clearing and reinstatement/re-vegetation on areas no longer required in accordance with the Closure and Rehabilitation Management Plan and Erosion and Sediment Control Plan.	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
FL33	Control of mechanically induced dust emissions (from clearing, scraping, excavation, loading, dumping filling and levelling activities) by application of water sprays when practicable.	At all times	Site Manager
FL34	Application of water sprays on conveyors.	At all times	Site Manager
FL35	Material drop heights during loading and unloading to be reduced as far as practical.	At all times	Site Manager
FL36	Application of water to the ore prior to crushing to obtain a minimum moisture content of 4% and a target of 10%.	At all times	Site Manager
FL37	Hooding of crushers with dust collection system capable of achieving adequate emissions reduction.	At all times	Site Manager
FL38	Enclosure of the High Pressure Grinding Role (HPGR) to achieve an adequate emissions reduction.	At all times	Site Manager
FL39	Full enclosure of processing equipment including crushers, screens and transfer points.	At all times	Site Manager
FL40	Maintenance program for crushing equipment will ensure that it is operating at peak efficiency.	At all times	Site Manager
FL41	All construction and maintenance equipment/vehicle to be operated and maintained to manufacturer's specifications in order to minimise exhaust emissions.	At all times	Site Manager
FL42	Post and enforce speed limits to reduce airborne fugitive dust from vehicular traffic	At all times	Site Manager
FL43	All dump trucks must have covered loads if dust is likely to be excessive before travelling on public roads	At all times	All personnel
FL44	Restrict or halt (whichever is relevant) mining, hauling and vehicle travel in the dry season when prevailing winds and strength of winds reach trigger level that would results in spatially extensive and heavy dust deposition in the Gouldian finch habitat area, in accordance with the Gouldian Finch Monitoring Plan (Attachment L5 and Attachment U1) and the Gouldian Finch Monitoring and Mitigation Program (Attachment U2).	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
FL45	Avoid conducting dust generating activities during high wind speeds, where practical	At all times	All personnel
FL46	Burning of waste materials will be allowed on site in accordance with the procedure outlined in the Waste Management Plan with controlled asset production burns to mitigate production of large amounts of smoke.	At all times	Site Manager
FL47	Spraying of paint will not be undertaken during unstable or unpredictable weather, or periods of winds above 15km/hr blowing towards the core breeding habitat.	At all times	All personnel
Noise and vibration			
FL48	Operation of more recent and silenced equipment where possible and maintained in good working condition	At all times	Site Manager
FL49	All new equipment to have sound control devices no less effective than those provided on the original equipment	At all times	Site Manager
FL50	Stationary equipment (i.e. crushers, compressors, generators etc.) will be located on the Eastern side of the open cut mine to minimize the impact on the Gouldian finch breeding habitat	At all times	Site Manager
FL51	Whenever feasible, schedule different noisy activities (e.g. blasting and earthmoving) to occur at the same time, since additional sources of noise generally do not add a significant amount of noise (i.e. less frequent noisy activities would be less disruptive than frequent less-noisy activities).	At all times	Site Manager
FL52	Adhere to criteria detailed within the ANZECC Blasting Guideline (1990) including: • Confined or deck charging blasting techniques will be used in preference to unconfined methods • Where practical, limit blasting to one (1) per day and after dawn and before dusk • Blasting will only occur during daylight hours • Ensure the initial blasts are as small as practical • Be aware of the geological make-up and terrain separating source with receiver and how this will impact transmission.	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
FL53	Identify alternative, lower-impact equipment of methods wherever possible	At all times	Site Manager
FL54	Route, operate or locate high vibration sources as far away from sensitive breeding habitat areas for the Gouldian Finch as practicable	At all times	Site Manager
FL55	Sequence operations so that vibration-causing activities do not occur simultaneously	At all times	Site Manager
FL56	Isolate vibration causing equipment on resilient mounts	At all times	Site Manager
FL57	Investigate vibration trigger levels at the known breeding habitat for the Gouldian finch and incorporate into the site Environmental Management Plan/Mine Management Plan	At all times	Site Manager
FL58	Develop blasting program to limit potential impact on Gouldian finches, initiating the blast in the direction away from the closest point to the Gouldian finch population receiver location, emissions from blasting, using an MIC in accordance with the airblast site law established for the mine, will assist in controlling airblast to acceptable levels.	At all times	Site Manager
Bushfire			
FL59	Early dry season 'patchy' mosaic approach to controlled burns across the mine site to be implemented whereby patches of habitat could be left unburnt for subsequent years and not burnt at all. Guidelines for burning is outlined in the Fire Management Plan.	Early dry season	Environment Manager
FL60	Patchy mosaic burns during early dry season to provide alternative habitat to Waste Rock Dump and Heap Leach Pad for Australian Bustard	Early dry season	Environment Manager
FL61	Controlled asset protection burns will only be carried out over a four-week prior in the late wet/early dry season.	Late wet/early dry season	Site Manager
FL62	If "hot work" is to be undertaken in any area where a potential fire hazard exists or in areas designated as a potential fire risk by Contractor in the risk assessment, a 'Hot Works' permit is required. In addition, a fire watcher or fire warden shall remain on watch for a minimum of 30 minutes after completion of the hot works.	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
	The "hot work" risk assessment will use Australian Standard AS 1674.1 Safety in welding and allied processes – Fire precautions to determine the required controls will be implemented.		
FL63	Strict fire prevention protocols to prevent wildfire into Gouldian Finch habitat during clearing activities, i.e. fire unit/spotter is present with any road crew.	At all times	Environment Manager
FL64	Suppression where practicable of all wildfires occurring in Gouldian Finch habitat as quickly as possible with the aim of limiting the spread of high intensity fires, if possible.	At all times	All personnel
FL65	No fire to be lit during designated fire bans. Fire ban status can be checked at: http://www.bom.gov.au/nt/warnings/index.shtml.	At all times	All personnel
Pests			
FL66	General site wastes will be managed to prevent/reduce interaction with fauna. Waste management includes: • Regular burning of the landfill; • Fencing installed surrounding the landfill to restrict interaction with fauna; • Waste storage outside of the landfill is to be situated in bins with lids secured; • Waste oils and/or hazardous substances will be kept in sealed containers and/or covered; and • All domestic waste outside the landfill/waste-storage facility is to be stored in vermin-proof bins with lids secured.	At all times	All personnel
FL67	Implement a Pest Monitoring Plan (***Table 4-1 Pest Monitoring Plan***) to incorporate monitoring pest populations and determine if control is required. Control of invasive predators such as cats may assist in conservation of Pale field-rat and Australian Bustard populations	At all times	Environment Manager
FL68	Management and removal of putrescible waste to limit the potential for colonisation by black rats.		
Light			
FL69	Implement a light reduction strategy including:	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
	• Limit artificial light to areas where it is essential; • Turn off lights when not required; • Avoid the flood of light into natural habitats and limit the escape of light into surrounding areas of fauna habitat (i.e. using shields/deflectors); • Ensure that artificial lighting is not directed upwards or laterally (i.e. should be directed towards the ground); • Lighting guards/shutters should be installed to direct light to road/working surfaces and away from adjacent vegetation; • Use lower (i.e. closer to the ground) rather than higher lighting installations; • Use lower wavelengths of light wherever possible i.e. red/yellow lights; • Use light intensities that are as low as possible without reducing safety or efficiency; • Avoid adverse offsite lighting impacts by implementing work procedures related to the use of mobile lighting plants; • Where possible, conduct operations behind light barriers, especially at night to avoid adverse offsite lighting impacts; and • Consider including reinforcement of screen plantings around areas where lighting plant are used extensively at night in offsite treatments.		
FL70	Minimise mine lights facing the SOCS 30 area.	At all times	Site Manager
FL71	Avoid painting large structures bright or reflective colours and minimise use of bright or reflective construction materials and finishes for large structures.	At all times	Site Manager
FL72	Conduct a lighting survey to ensure optimal placement of all lighting plants.	Prior to operations commencing	Environment Manager
Water Storage Areas			
FL73	Compliance with the Waste Discharge Licence	At all times	Environment Manager
FL74	Waste water to be treated by a cyanide destruction plant prior to discharge to Tailings Storage Facility (cyanide levels below toxic level) to minimize weak-acid-dissociable cyanide (WAD CN).	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
FL75	Reduce attractiveness (to wildlife such as Mertens' water monitor and Pale field-rat) of the Residue Storage Facility, Flotation Tailings Storage Facility, Sediment Basins and Process Water Ponds through the implementation of Best Practice Guidelines for Reducing Impacts of Tailings Storage Facilities on Avian Wildlife (DME, 1998) including: • Design dam to minimise dam surface area, create steep dam walls, avoid the creation of islands in the dam • Consider fencing off tailings storage facilities to prevent ground-based fauna from accessing the water. • Maintain vegetation cover surrounding water sources to a minimum, i.e. no significant vegetation on dam walls	At all times	Site Manager
FL76	Consider providing alternative adjacent Gouldian finch friendly water sources.	At all times	Site Manager
FL77	Trigger levels of WAD CN where remediation action regarding water quality will be developed.	At all times	Site Manager
Traffic			
FL78	Vehicle driving policies will be implemented (including speed restrictions) to minimise risk to fauna. This will include signage surrounding Jatbula Road crossing on Stow creek and on the Northern Access Road to minimize dust to surrounding Crested shrike-tit and Painted honeyeater habitat.	At all times	All personnel
FL79	Use of pooled vehicles such as buses and work vehicles (to minimise exposure)	At all times	All personnel
FL80	Permits will be allocated for vehicle access to known Gouldian Finch breeding habitat during the critical breeding season.	At all times	All personnel
	Slow speed limits enforced within Australian Bustard habitat associated within the Waste Rock Dump and Heap Leach Pad to minimise mortality from vehicle collision	At all times	All personnel
Revegetation			
FL81	Revegetate disturbed areas as soon as practicable after disturbance	At all times	Site Manager

ID	Mitigation Measures	Timing	Responsibility
FL82	Design and construct final landforms such that the surface is stable and not prone to erosion.	At all times	Site Manager
Uncertainty in data			
FL83	Implement research projects to fill knowledge gaps including: • Erection of artificial nest boxes; • Camera monitoring at waterholes; • Utilisation of artificial water points to attract finches to capture points; • Captive breeding program and associated bird physiological monitoring (in the aviary); and • Burning regimes and patches. Each of these projects to include a comprehensive assessment of risks, in consultation with relevant experts including relevant government agencies, to ensure that additional threats or increased impacts are not introduced as a consequence.	First 5 years of operations	Environment Manager

3.5 Trigger, Action and Response Plan

The Trigger, Action and Response Plan (TARP) outlines remedial actions and responses to the situation. The TARP is provided in Table 3-5.

Table 3-5 Trigger, Action and Response Plan

Responsibility	Situation		
	Normal	**Level 1**	**Level 2**
Fauna			
	Fauna observed and behaving normally.	Native fauna observed in the area construction and/or operational activities.	Native fauna injured or killed due to mine activities.
All Personnel	Continue to operate diligently in accordance with site induction flora and fauna components.	• Encourage or wait for native fauna to vacate construction areas. • Report sighting to the Environment Manager.	• Report to Site Manager. • If fauna is killed, remove from road at least 20m into adjacent bush land.
Environment Manager	-	• Enter sighting into Fauna Sighting and Fatality Register (**Attachment L3**).	• If fauna is injured, assess the situation and potential requirement to euthanize and/or contact Katherine Wildlife Rescue Service for advice: M: 0407 934 252 • If fauna is killed, remove from road at least 20m into adjacent land. • Record incident in Fauna Sighting and Incident Register (**Attachment L3**). • Determine if species is a threatened species and if the death activates additional contingency measures. Record death within Fauna Sighting and Fatality Register (**Attachment L3**) or record as an environmental incident in the case of a threatened species death.
Site Manager	Ensure the Flora and Fauna Management Plan (this document). is being implemented by all Site Personnel.		• Assist the Environment Manager in addressing potential installation of contingency measures.

Responsibility	Situation		
	Normal	**Level 1**	**Level 2**
Gouldian Finch			
	Nil, or minimal (<10%), reduction in distribution and extent of *A. semialata* habitat, as a primary consequence of mining activities.	**Trigger:** Between 10% and 30% reduction in distribution and extent of *A. semialata* habitat, as a primary consequence of mining activities.	• **Trigger:** >30% reduction distribution and extent of *A.semialata* habitat, as a primary consequence of mining activities.
Environmental Officer	Undertake monitoring as detailed in the Flora and Fauna Management Plan (this document).	• Investigate trigger in consultation with the NT EPA and/or DENR (and others, if appropriate) including comparison against control site data • Identify whether additional remedial action is required in consultation with the NT EPA and/or DENR (and others, if appropriate) • Implement remedial action as agreed by the NT EPA and/or DENR (and others, as appropriate) • Monitor success of remedy. • Consider, in consultation with the NT EPA and/or DENR, habitat improvement specific to *A. semialata* through the use of fire or supplementary establishment of *A. semialata* individuals. • Consider, in consultation with the NT EPA and/or DENR, establishment of a vegetation buffer between the core breeding and foraging areas and key emissions sources.	• Develop strategy, in consultation with the NT EPA and/or DENR, to ensure viability of *A. semialata* habitat important (i.e. within 3km) to the Yinberrie Hills Gouldian finch population is enhanced.

Responsibility	Situation		
	Normal	**Level 1**	**Level 2**
Pests			
	No change in the feral cat population and no more than a 50% increase in the dingo population.	**Trigger:** > 10% increase in numbers of cat individuals detected across two annual surveys >50% increase in abundance of dingoes across two annual surveys.	
Environmental Officer	Undertake pest monitoring as detailed in ***Table 4-1 Pest Monitoring Plan***. Record any incidental pest sightings into Fauna Sighting and Fatality Register (**Attachment L3**).	• **Cats:** A range of methods to be trialled upon the outset of the Project to determine the most effective and efficient method. Possible methods include: – Poisoned baiting; – Trapping (e.g., cage trapping); – Shooting; and – Grooming traps (innovative new passive baiting and trapping methods that target cats (http://www.ecologicalhorizons.com/initiatives). Grooming Traps may provide a long-term tool to control trap- or bait-shy cats. • **Dingoes:** Dingoes are native predators and are not expected to require regular or frequent active population control measures. However, if the mine activities promote an increase in non-native rats and mice, allowing dingo populations to get unnaturally large to the point where they threaten native fauna also, then control measures may be required. Possible methods include: – Poisoned baiting; or – Shooting. Control of dingo populations, if required, is expected to involve removal of relatively small numbers of individuals, rather than broadscale population control and would be undertaken in consultation with regulatory authorities.	

4. Monitoring Program

Monitoring programs will be established in ways that allow baseline information to be compared against subsequent repeat surveys. If monitoring indicates that the current mitigation efforts are inadequate then revised or increased mitigation measures will be implemented to protect biodiversity.

Monitoring plans have been established to determine if mitigation measures at the MTPA are sufficient. The plans include:

- Pest Monitoring Plan (TABLE 4-1 PEST MONITORING PLAN); and
- Gouldian Finch Monitoring Plan (**Attachment L5** and **Attachment U2**) and the Gouldian Finch Monitoring and Mitigation Program (**Attachment U2**);

Other monitoring plans that measure that sufficiency of mitigation measures associated with flora and fauna include:

- Weed Monitoring Plan (refer to Weed Management Plan - Appendix J of the MMP);
- Bushfire Monitoring Plan (refer to Fire Management Plan - Appendix K of the MMP);
- Air Quality Monitoring Plan (refer to Air Quality Management Plan - Appendix I of the MMP); and
- Noise, Vibration and Light Monitoring Plan (refer to Noise, Vibration and Light Management Plan - Appendix O of the MMP).

Regular monitoring of the MTPA for exotic fauna species will be undertaken as per Pest Monitoring Plan (***Table 4-1 Pest Monitoring Plan***); and control measures will be implemented should the densities become a risk to biodiversity.

Table 4-1 Pest Monitoring Plan

Program		Pest Monitoring Plan
Objective		Establish baseline and subsequent comparative data on population sizes of pest species to inform control program.
Survey Effort	Survey	Establish baseline data by undertaking a motion-sensing camera survey prior to construction, using site occupancy as the measure of predator populations. Cameras to be deployed for a minimum of 28 nights. Complete of the pest fauna register (0).
	Operation	Establish 30 baited camera stations that can be repeatedly used including: • 10 sites within 100m of proposed mine activities (particularly around the landfill); • 10 sites approximately 1km from mine activities; and • 10 sites more than 5km from mine activities.
	Timing	Annual (during operation)
	Personnel	A Qualified ecologist.
Trigger Points	Cats	**Acceptable level of change:** No increase Any increase in population size is likely to be detrimental to biodiversity. Action required if >10% increase in numbers of individuals detected across two surveys.

	Dingoes	**Acceptable level of change:** Moderate change Dingoes are native predators and their presence is likely to limit the population size of other predators (cats). Therefore, dingo presence and increase in population is acceptable. However, over-abundance of dingoes is likely to be detrimental to threatened species. Action required if >50% increase in abundance across two surveys.
Personnel		Environmental Officer
Contingency		Implement or increase predator control program as required. Implement or increase cat control efforts, through trapping, poisoning, shooting. Make sure predator control method does not result in the unintentional capture or death of threatened fauna species.

5. References

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Attachments

Attachment L1 – Risk Matrix

Definitions Consequence Ratings

Rating	Consequence	Environmental (including Heritage)	Social and Regulatory (including Health & Safety)	Economic
5	Critical	Extensive long term environmental harm and / or harm that is extremely widespread. Impacts unlikely to be reversible within 10 years. Widespread / catastrophic detrimental long term impacts on the environment, which could include extensive pollutant discharges. Unsalvageable and permanent damage to sensitive structures or sites of cultural significance or sacred value.	Loss of life / fatality; or long term or permanent disabling effects on human health (more than one person). Community condemnation and irreconcilable community loss of confidence (including severe and detrimental long term impacts on the community and / or public health). Public or media attention of national to international scale. Severe action / prosecution by key agencies including the likes of NT EPA, Department of Mines and Energy, AAPA and NT WorkSafe. Major litigation or prosecution.	> $10m impact on company or stakeholders.
4	Major	Major or widespread, unplanned environmental impact on or off the site. Significant resources required to respond and rehabilitate. Major detrimental long term impacts on the environment, which could include substantial pollutant discharges. Major damage or infringement to sensitive structures or sites of cultural significance or sacred value.	Injuries requiring hospitalisation. Serious long term or permanent disabling effects on human health (one person). Prolonged community condemnation or annoyance and / or loss of confidence and local media attention. Major regulatory restrictions or orders – substantial prosecution.	$5m - $10m impact on company or stakeholders.
3	Significant	Significant, unplanned environmental impact contained within the site or minor impact that is off the site. Considerable damage or infringement to sensitive	Injury or illness requiring medical treatment. Short term or reversible disabling effect (impairment) to human health. Limited and localised loss of confidence by the community.	$2m - $5m impact on company or stakeholders.

Rating	Consequence	Environmental (including Heritage)	Social and Regulatory (including Health & Safety)	Economic
		structures or sites of cultural significance or sacred value.	Significant breach of regulations. Direction to operate under limited regulatory restrictions or orders.	
2	Moderate	Moderate, unplanned localised environmental impact (maybe of a temporary nature) or discharge contained on-site or with negligible off-site impact. Moderate but repairable damage to important historic structures or sites of cultural importance.	Injuries requiring first aid treatment. Minor short term inconvenience or symptoms to human health. Localised community impacts and concerns. Some regulatory restrictions, associated with breach of regulation with investigation or report to authority necessary.	$100k - $2m impact on company or stakeholders.
1	Minor	Minor environmental impact. Any impacts are contained on-site and short term in nature. No detrimental effect on the environment. Minor repairable damage to more common structures or sites. No disturbance of historic and / or cultural heritage sites.	Incident with or without minor injury. No impact on human health or very minor short term inconvenience or symptoms. Isolated community or individual issue-based concern and complaints. Minor issues around non-compliance.	Insignificant < $100k impact on company or stakeholders.

Definition of Likelihood Ratings

Rating	Likelihood	Definitions
5	Almost certain	The event is expected to occur in most circumstances (The event is likely to occur once per year).
4	Likely	The event will probably occur in most circumstances (The event is likely to occur once every 1 – 2 years).
3	Possible	The event might occur at some time (The event is likely to occur once every 2 – 5 years).
2	Unlikely	The event could occur at some time (The event is likely to occur once every 5 – 10 years).
1	Rare	The event may occur only in exceptional circumstances (The event is unlikely to occur in any 10 year period).

Qualitative Risk Analysis Matrix

Likelihood of Consequence	Severity of Consequence					
		Critical (5)	Major (4)	Significant (3)	Moderate (2)	Minor (1)
	Almost Certain (5)	Extreme	Extreme	High	High	Medium
	Likely (4)	Extreme	High	High	Medium	Medium
	Possible (3)	Extreme	High	Medium	Medium	Low
	Unlikely (2)	High	Medium	Medium	Low	Very Low
	Rare (1)	Medium	Medium	Low	Low	Very Low

Attachment L2 – Ground Disturbance Permit Instructions

Section 1 - Application

Upon completion of design or instruction from Vista Gold the applicant is to complete and submit Section 1 a minimum of 72 hours prior to ground disturbance. No ground disturbance is to be undertaken prior to approval. The applicant is required to complete, sign and submit the form to the Environmental Manager. The form requires the following details:

Applicant: Contractor or supervisor responsible for the work area.

Vista Gold Area Manager/Supervisor: Company representative responsible for the works area. Summary

of Clearing Request:

Contractor(s): Applicant Company and any subcontractors to be used are summarised including roles and contact details.

Purpose: Summary of works and its relation to the mine.

Related Infrastructure: Detail what infrastructure will be constructed post clearing (i.e. drill pad, ROM Pad, etc).

Location: Brief description of the location for ground disturbance.

Clearing Summary: Equipment to be utilised, process to be followed (i.e. vegetation removal, topsoil strip, etc) and location of stockpiles.

Proposed Clearing Dates: Dates for clearance to occur and timings (i.e. day shift 06:00 to 18:00). Area:

Details of total area to be cleared as part of this permit.

No-go zones: Summary of no-go zone at or adjacent to proposed ground disturbance including Aboriginal Area Protection Authority (AAPA) Restricted Works Area (RWA), heritage locations and/or identified threatened species or sensitive vegetation (see ***Figure 2-4: No-go zones for the mine site***)

Section 2 - Review

Section 2 provides a framework for the disturbance to be assessed against to ensure compliance with mine approvals including the Cultural Heritage, Weed and Flora and Fauna Management Plans.

The application will be assessed by the Environmental Manager or representative. The assessment will determine if the disturbance is approved as part of the existing approvals and if it is compliant with the relevant Management Plans. Should insufficient detail have been provided within Section 1, the application will be returned to the Applicant with a request for more information.

Section 3 – Approval

Section 3 provides approval to an applicant to undertake the disturbance and describes associated approval conditions. The approval will be provided with a unique identification number and will be signed by the Environmental Manager (or representative), applicant and Company Area Manager / Supervisor.

Section 4 – Ground Disturbance

Section 4 will capture the disturbance process including duration and a summary of the works. The summary will include conditions encountered, animals observed or translocated, stockpile locations and weed status.

Ground Disturbance Permit

Section 1 - Application

This form must be completed before any work commences. Applicant to complete and provided to the

Environmental Manager a minimum of 72 hours prior to ground disturbance.

Vista Gold Area Manager/Supervisor	
Name	
Position	
Contact No.	

Applicant	**Author**
Name	
Position	
Employer	
Contact No.	

Summary Ground Disturbance Request	
Contractor(s) Entity, roles and contact details.	
Purpose Rationale or reason for clearing.	
Related Infrastructure Type of infrastructure to be constructed at disturbance.	
Location Summary and central grid references.	
Tenement / Lease Detail lease ID and confirm it is on lease.	
Clearing Summary	

Summary Ground Disturbance Request			
Equipment, process and stockpile locations (vegetation and soil).			
Date(s) and Time(s) for Proposed Clearing and Work Activity Duration of clearing and works.			
Area (Ha) Append Map			
High Risk Locations AAPA Restricted Work Areas, Creeks/Rivers. Threatened Species (see Figure 2-3 & Figure 2-4)			
High Risk Control Measures Installation of additional flagging tape and / or spotter.			
Request Submission			
Applicant Signature		**Date**	

Section 2 - Review

Environmental Manager or representative to review found disturbance request and determine if it is within the lease, approved through the EIS and/or high risk control measures are sufficient.

Review	
stations or surface water monitoring locations)?	
Confirm area to be disturbed will be / has been flagged?	

Confirm clearing extents are restricted to six weeks work in December, January and February and eight weeks for alternative months (in accordance with the Erosion and Sediment Control Plan) If clearing is for larger areas >than eight/six weeks works inform the Applicant this is to be restricted and a new permit should be applied for.	
Confirm disturbance will not impact on buried or overhead services (culverts)?	
Cultural Heritage	
Is the disturbance outside of AAPA Restricted Work Areas (RWA)? No works are to occur within RWAs without written approval from AAPA.	
Is the disturbance within close proximity (i.e. 50 m) of an RWA? < 50m additional flagging and a spotter are required	
Will the disturbance impact identified cultural heritage? Assess if cultural heritage can be avoided in unison with Applicant. If not: 1) Complete Heritage Branch 'Application to Carry Out Work on Heritage Plan or Object';	

Review		
2) Wait for Heritage Branch work approval; and 3) Notify traditional owners of disturbance dates and invite to supervise works.		
Flora and Fauna		
Have flora and fauna surveys been undertaken across the disturbance? No works are to occur without flora or fauna survey being undertaken to identify threatened species.		
Have threatened species been identified in the disturbance footprint? If so, a qualified ecologist is to be present onsite to capture and translocate animals encountered.		
Have threatened flora been identified in the disturbance footprint?	Yes ☐	No ☐
Has a site walkover identified indication of threatened species? If so, a qualified ecologist is to be present onsite to capture and translocate animals encountered.		
Have weeds been identified within the disturbance footprint? If so, weeds are to be removed prior to vegetation clearance.		
Where will vegetation stockpiles from the disturbance be located? Include vegetation stockpile locations within Weed Management Plan and		

Review	
monthly weed infestation monitoring/control.	
Excess Material Management	
Where will soil stockpiles from the disturbance be located? Stockpiles to be kept at designated topsoil storage locations to facilitate erosion and sediment control management.	
Will stockpile material type and volumes be recorded? Contractor and/or Environmental Manager to record volumes and materials for future reference and assist in rehabilitation of site.	
Survey Management	
Has the disturbance been scheduled for survey? Survey data required to facilitate site security estimations. Environmental Manager to organise survey of the disturbance.	

Section 2 – Approval

Disturbance Approval	GDP No.	
Conditions of Approval		

Clearing Date(s)	

Environmental Manager		**Signature**		**Date**	
Vista Gold Manager / Supervisor		**Signature**		**Date**	

Applicant Acceptance					
Applicant		**Signature**		**Date**	

Section 4 – Works Summary

Contractor or Vista Gold Area Manager / Supervisor to provide clearance dates and summary of an issues/recommendations for future disturbances. **The ground Disturbance Permit is to be returned to the Environmental Manger or representative when works are complete for inclusion in the Ground Disturbance Database.**

Ground Disturbance			
Start		**Finnish**	
Date		**Date**	
Time		**Time**	
Summary of Disturbance Conditions encountered, animals observed or translocated and weed status.			
Survey Data Extents of disturbance and location.			

Attachment L3 – Fauna Sighting and Fatality Register

Date (--/--/--)	Time (----)	Animal (Type / Name)	Number	Condition (Sighting, Injured, Dead)	Conservation Status (Native, Migratory, Feral, Introduced, Threatened, Unknown)	Location (Reference to infrastructure)	Interaction Details (Summary of interaction including how fauna was injured or killed by mine activities and measures taken)

Attachment L5 – Gouldian Finch Monitoring Plan

Variable to be measured	Objective/s	Technique/s	Location	Timing (to be undertaken for the life of the mine unless otherwise indicated)	Outputs
ENVIRONMENTAL (EXTRINSIC) INDICATORS					
Airborne particulate concentrations	Test concentrations of dust in finch habitats.	Install particulate monitors to carry out monitoring of airborne particulate concentrations (PM_{10} and $PM_{2.5}$)	Airborne particulate monitoring stations Control sites	Real time monitors (operating continuously)	Data collected from both PM_{10} and $PM_{2.5}$ particulate loggers for varying monitoring locations
Dust deposition	Test dust deposition levels in key finch habitats	Install dust deposition gauges.	Dust deposition stations	Once per month.	Baseline and ongoing dust deposition levels.
Noise	Test noise levels in finch habitats Test project operational noise controls / effect threshold levels and to more accurately define the potential for risk.	Install noise loggers at selected monitoring stations.	Noise monitoring stations	Until blasting ceases, or until such time that it is considered that noise levels are such that no adverse effects to Gouldian Finches are likely.	Baseline and ongoing ambient noise levels collected from each monitoring station
Blast levels	Test blasting levels in finch habitats Test project operational blasting controls / effect threshold levels and to more accurately define the potential for risk.	Install blast monitoring units at selected monitoring stations	Blasting monitoring stations	Until blasting ceases or such time that it is considered that blasting levels are such that no adverse effects to Gouldian Finches are likely.	Blast level log
Fires	Assess against objectives and indicators described in the Bush Fire Management Plan Monitor extent, timing and frequency of fires Determine what proportion of, and/or influence from, mine-related fires (i.e. asset protection burns and unintended ignitions from road crews or increased traffic) have overall.	Documentation and mapping of fire regimes Comparison to fire regimes recommended for the species (e.g. Lewis, 2003) Analysis of the North Australian Fire Information website	Within 10 km of the Yinberrie Hills (i.e. within habitat considered 'important', 'marginal' and 'distant')	Annually	Documentation of fire regimes GIS mapping
Light	Test light levels in finch habitats Test light modelling and to more accurately define the potential for risk.	Test light levels using a lux meter at monitoring stations	To be confirmed following final lighting specifications developed during the detailed design phase.	To be confirmed following final lighting specifications developed during the detailed design phase.	Light level log and, if required, audit report and recommendations.
Water quality	Test water quality in mine-related water bodies.	Analyse water for levels of contaminants	Water samples taken at the mine's dams or any potential waterbodies with effluent.	Three times per year (two during the dry season and one during wet season)	Water quality data
Meteorological Conditions	Monitor meteorological conditions across the site	Install weather station	Within the mine infrastructure zone	Daily	Weather log
BIOLOGICAL INDICATORS					
Stress physiology and body condition	Determine whether mine-related dust is causing a decline of the Yinberrie Hills Gouldian Finch population by testing predicted dust effect thresholds Predict how the Yinberrie Hills Gouldian Finch population	Capture bird via mist netting or walk in traps and measuring: - Body condition via a muscle score	Yinberrie Hills (impact site) 2 control locations	Biannually	Causal effects, trends between populations, and recommendations to mitigation (if required).

Variable to be measured	Objective/s	Technique/s	Location	Timing (to be undertaken for the life of the mine unless otherwise indicated)	Outputs
	will respond to forecast dust levels	- Haematological condition via blood sampling			
Relative abundance of Gouldian Finches (population index)	Use point counts of Gouldian Finches to calculate population indices. Detect changes in indices.	Waterhole counts[3]	A selection of known waterholes in the Yinberrie Hills (**Figure 3**) Additional waterholes identified during reconnaissance trips will be considered for inclusion.	Annually during late dry season when water is limited and birds congregate at available waterholes	Population index Raw data for waterhole counts
Relative abundance and distribution of a key non-breeding season food resource (*Alloteropsis semialata*)	Locate patches of *A. semialata* Assess and monitor patches for extent and condition Test dust deposition levels in these locations	Traverse potential *A. semialata* habitat during the early wet season when the species is flowering/seeding.	Areas of potential *A. semialata* habitat identified during early wet season searches.	Annually, during the early wet season.[4]	Record of extent and condition attributes GIS mapping with locations Causal effects, trends of dust levels, and recommendations to mitigation (if required).
Gouldian Finch presence / absence	Record incidental sightings to test presence throughout year.	Key environmental staff trained in the recognition of Gouldian Finches and their calls. Records locations with GPS and in the Mt Todd Gouldian Finch sightings database.	Mining lease and Yinberrie Hills.	Continually	Additional contextual (or anecdotal) information

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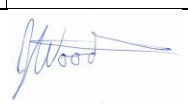
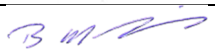
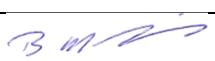
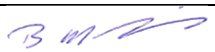
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
REV 0	Kirsten Marmion	James Hill		Nicole Conroy		09/09/2017
Rev 1	James Hill	Jill Woodworth		Jill Woodworth		16/11/2017
Rev 2	Brent Murdoch	John Rozelle		Brent Murdoch		31/11/2018
Rev 3	Julia Curran / Loren Yallop	Jill Woodworth		Brent Murdoch		18/06/2020
Rev 4	Brent Murdoch	John Rozelle		Brent Murdoch		23/05/2022

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