



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

<b>Purpose Permit number:</b>	CPS 9866/1
<b>Permit Holder:</b>	Process Minerals International Pty Ltd
<b>Duration of Permit:</b>	From 23 September 2023 to 23 September 2033

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

### **PART I – CLEARING AUTHORISED**

#### **1. Clearing authorised (purpose)**

The permit holder is authorised to clear *native vegetation* for the purpose of mineral exploration.

#### **2. Land on which clearing is to be done**

Lot 105 on Deposited Plan 40396, Karamindie  
Lot 94 on Deposited Plan 220400, Karamindie

#### **3. Clearing authorised**

The permit holder must not clear more than 120 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

#### **4. Period during which clearing is authorised**

The permit holder must not clear any *native vegetation* after 23 September 2028.

#### **5. Application**

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear *native vegetation* for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

## **PART II – MANAGEMENT CONDITIONS**

### **6. Avoid, minimise, and reduce impacts and extent of clearing**

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- (a) avoid the clearing of *native vegetation*;
- (b) minimise the amount of *native vegetation* to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

### **7. Weed control**

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

### **8. Directional clearing**

The permit holder must conduct clearing activities in a slow, progressive manner in the direction of the adjacent vegetation to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

### **9. Flora Management –**

Prior to undertaking any clearing authorised under this Permit, the Permit Holder shall:

- (a) demarcate the area to be cleared;
- (b) any *Eremophila acutifolia* individuals within the area demarcated under condition 9(a), shall be flagged for avoidance, where practical.

### **10. Fauna management - Pre-clearance survey**

- (a) Prior to undertaking any clearing authorised under this permit, the permit holder shall engage a *fauna specialist* to undertake clearance surveys within the areas cross-hatched yellow on Figure 1 of Schedule 1 for Shield-backed trapdoor spiders (*Idiosoma sp*) and Malleefowl (*Leipoa ocellata*), including the identification and inspection of burrows and active and inactive mounds;
- (b) The Shield-backed trapdoor spider and Malleefowl pre-clearance survey should also include searches for other conservation significant fauna.
- (c) Where burrows and mounds are identified under condition 10(a) of this permit, the permit holder shall:
  - (i) flag the location of the burrow(s) and mound(s);
  - (ii) not clear within 50 metres of single Shield-backed trapdoor spider burrow(s);
  - (iii) not clear within 200 metres of matriarchal clusters of Shield-backed trapdoor spider burrow(s)

- (iv) not clear within 50 metres of Malleefowl mound(s)

**11. Fauna management – Malleefowl**

Ensure no clearing occurs within the area cross-hatched red in Figure 2B of Schedule 2 of this Permit unless first approved by the CEO.

**12. Fauna Management - Shield-backed trapdoor spider**

Ensure no clearing occurs within the area cross-hatched red in Figure 2A and 2B of Schedule 2 of this Permit unless first approved by the CEO.

**13. Fauna Management**

The Permit Holder shall not clear *habitat trees* within the Permit area unless approved by the CEO.

**14. Retain vegetative material and topsoil, revegetation and rehabilitation**

The Permit Holder shall:

- (a) Retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil in an area that has already been cleared.
- (b) Within 12 months following completion of clearing authorised under this permit, *revegetate* and *rehabilitate* areas not required for the purpose for which they were cleared, by:
  - (i) ripping the ground on the contour to remove soil compaction; and
  - (ii) laying the vegetative material and topsoil retained under condition 14(a) on the cleared area(s).
- (c) Within 4 years of undertaking *revegetation* and *rehabilitation* in accordance with condition 14(b) of this Permit:
  - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
  - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 14(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.
- (d) where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with Condition 14(c)(ii) of this Permit, the Permit Holder shall repeat Condition 14(c)(i) and 14(c)(ii) within 24 months of undertaking the additional *planting* or *direct seeding* of native vegetation.
- (e) where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a

similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in Condition 14(c)(i) and (ii) of this Permit, that determination shall be submitted for the CEO's consideration. If the CEO does not agree with the determination made under Condition 14(c)(ii), the CEO may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under Condition 14(c)(ii).

### **PART III - RECORD KEEPING AND REPORTING**

#### **15. Records that must be kept**

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

**Table 1: Records that must be kept**

<b>No.</b>	<b>Relevant matter</b>	<b>Specifications</b>
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> <li>(a) the species composition, structure, and density of the cleared area;</li> <li>(b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings;</li> <li>(c) the date that the area was cleared;</li> <li>(d) the size of the area cleared (in hectares); and</li> <li>(e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 6; and</li> <li>(f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> in accordance with condition 7; and</li> <li>(g) actions taken to manage and mitigate impacts fauna in accordance with condition 11, 12, and 13.</li> </ul>
2.	In relation to flora management pursuant to condition 9	<ul style="list-style-type: none"> <li>(a) actions taken to avoid the clearing of or priority flora species;</li> <li>(b) the name and location of each priority flora species taken, recorded using a Global Positioning System (GPS) unit set to GDA2020, expressing the geographical coordinates in Eastings and Northings.</li> </ul>
3.	In relation to the pre-clearing survey pursuant to condition 10	<ul style="list-style-type: none"> <li>(a) the time (s) and date(s) that the survey was undertaken</li> <li>(b) the name and qualification of the fauna specialist performing the survey</li> <li>(c) the methodology used to survey the Permit Area and to identify the mound/s; burrows</li> <li>(d) the location of each <i>Leipoa ocellata</i> (Malleefowl) mound and <i>Idiosoma sp.</i> burrow recorded using a Global Positioning</li> </ul>

No.	Relevant matter	Specifications
		System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees.
4.	In relation to the <i>revegetation</i> and <i>rehabilitation</i> of areas pursuant to condition 14 of this Permit	<p>(a) the location of any areas <i>revegetated</i> and <i>rehabilitated</i>, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the geographical coordinates in Eastings and Northings or decimal degrees;</p> <p>(b) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken;</p> <p>(c) the size of the area <i>revegetated</i> and <i>rehabilitated</i> (in hectares).</p>

## 16. Reporting

- (a) The permit holder must provide to the CEO on or before 30 June of each year, a written report:
- (i) of records required under condition 15 of this Permit; and
  - (ii) concerning activities done by the permit holder under this permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the CEO on or before 30 June of each year.
- (c) The permit holder must provide to the CEO, no later than 23 June 2033 a written report of records required under condition 15, where these records have not already been provided under condition 16(a).

## DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

**Table 2: Definitions**

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.

Term	Definition
direct seeding	means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species
EP Act	<i>Environmental Protection Act 1986</i> (WA)
environmental specialist	means a person who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist.
fauna specialist	means a person who holds a tertiary qualification specialising in environmental science or equivalent, and has a minimum of 2 years work experience in fauna identification and surveys of fauna native to the region being inspected or surveyed, or who is approved by the CEO as a suitable fauna specialist for the bioregion, and who holds a valid fauna licence issued under the <i>Biodiversity Conservation Act 2016</i> .
fill	means material used to increase the ground level, or to fill a depression.
habitat trees	means trees that have a diameter, measured at 130 centimetres from the base of the tree, of 30 centimetres or greater
local provenance	means native vegetation seeds and propagating material from natural sources within 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
planting	means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species.
revegetate/ed/ion and rehabilitate/ed/ion	means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.
weeds	means any plant – (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i> ; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

---

## END OF CONDITIONS


 Digitally signed  
 by Ryan Mincham  
 Date: 2023.08.31  
 21:48:11 +08'00'

---

Ryan Mincham  
 MANAGER  
 NATIVE VEGETATION REGULATION

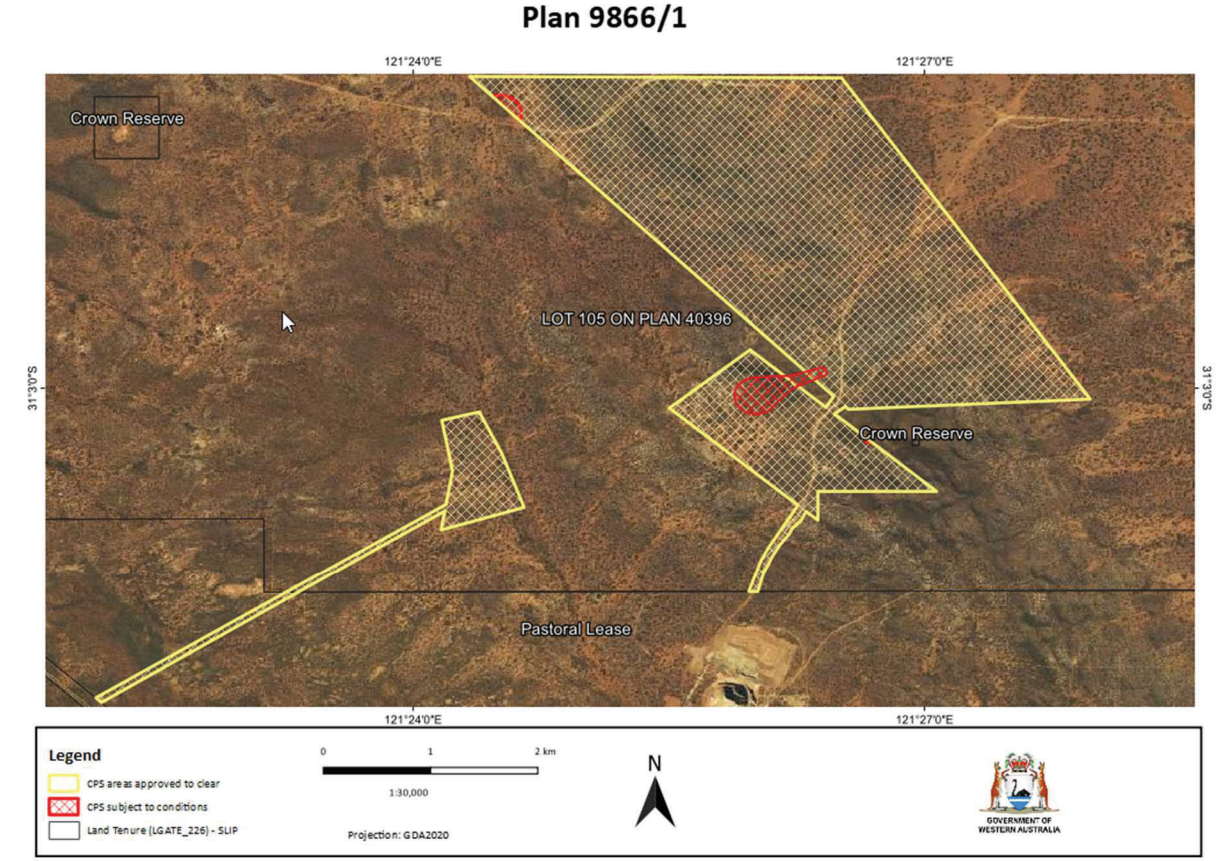
*Officer delegated under Section 20  
 of the Environmental Protection Act 1986*

31 August 2023



# Schedule 1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).



**Figure 1:** Map of the boundary of the area within which clearing may occur.



Schedule 2 – Areas subject to conditions

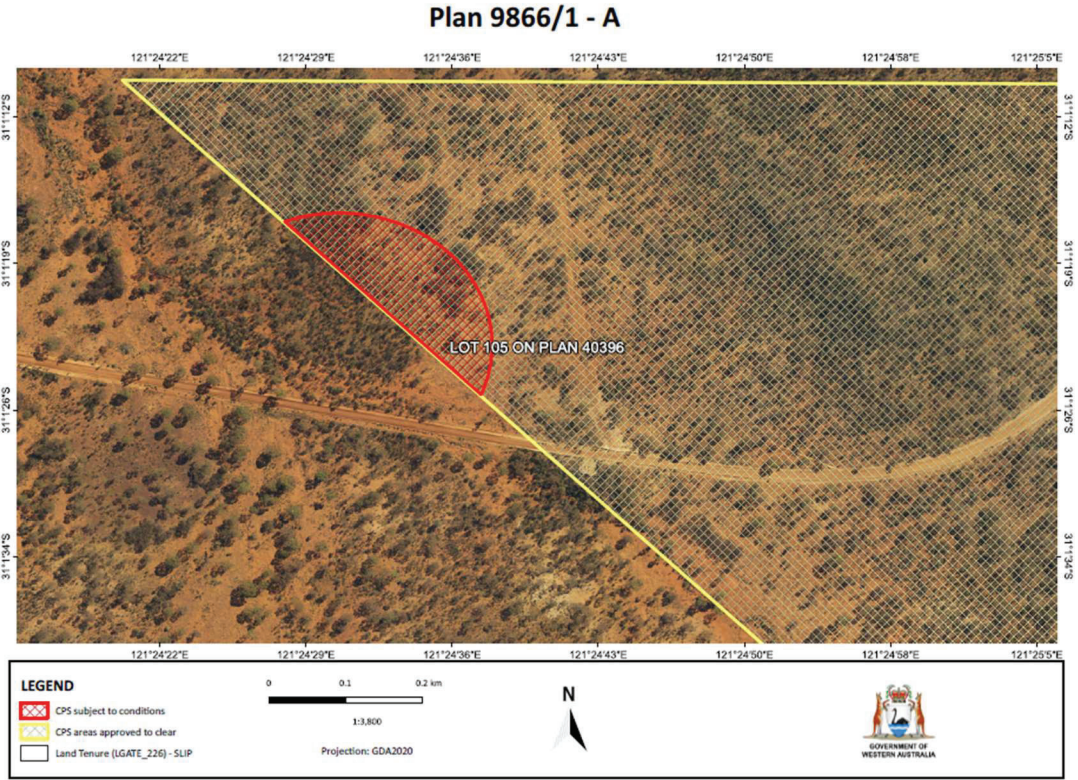


Figure 2A. Clearing may not occur within the area shaded red to protect known *Idiosoma sp.* burrows

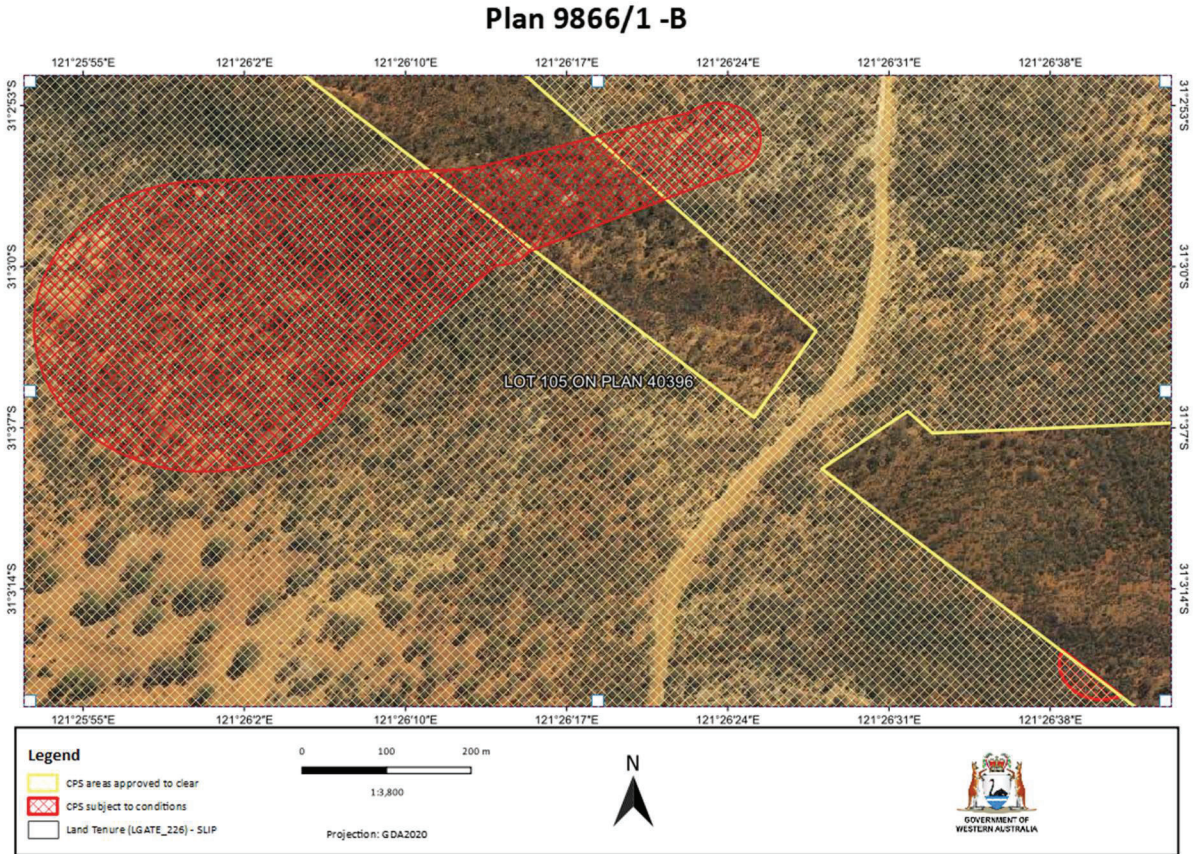


Figure 2B. Clearing may not occur within the area shaded red to protect known *Idiosoma sp.* burrows and a *Leiopoia ocellata* mound





# Clearing Permit Decision Report

## 1 Application details and outcome

### 1.1. Permit application details

<b>Permit number:</b>	CPS 9866/1
<b>Permit type:</b>	Purpose permit
<b>Applicant name:</b>	Process Minerals International Pty Ltd
<b>Application received:</b>	29 August 2022
<b>Application area:</b>	120 hectares (ha) within a 1,311 ha of clearing footprint
<b>Purpose of clearing:</b>	Mineral exploration
<b>Method of clearing:</b>	Mechanical
<b>Property:</b>	Lot 105 on Deposited Plan 40396 Lot 94 on Deposited Plan 220400
<b>Location (LGA area/s):</b>	Shire of Coolgardie
<b>Localities (suburb/s):</b>	Karamindie

### 1.2. Description of clearing activities

The application is to clear up to 120 ha of native vegetation within a 1,311 ha clearing footprint. The proposed clearing is for the purpose of lithium mineral exploration and will occur within Lot 105 on Deposited Plan 40396 (Lot 105) and Lot 94 on Deposited Plan 220400 (Lot 94), Karamindie. Lot 105 retains a special land category area, Exempt East Location (EEL), Greater Hampton, Northern Hampton Area 53, referred to hereafter as the Northern Hampton Area 53. Lot 94 is intersected by Exploration Licence E15/1599.

Once exploration is completed, the applicant intends to expand mining operations into this area should it be determined feasible. Clearing associated with the future mining activities is not covered by this application.

### 1.3. Decision on application

<b>Decision:</b>	Granted
<b>Decision date:</b>	31 August 2023
<b>Decision area:</b>	120 ha of native vegetation as depicted in Section 1.5, below.

#### 1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix A), relevant datasets (see Appendix E.1), the findings of flora, vegetation and fauna surveys (see Appendix D), the clearing principles set out in Schedule 5 of the EP Act (see Appendix B), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). In particular, the Delegated Officer has considered the following:

- Clearing may have a significant impact on the local population of *Idiosoma sp.* A total of five (5) burrows are located within the application area, two of which are matriarchal clusters of burrows. The impacts can be mitigated by avoiding clearing around the areas with known burrows, while a pre-clearing survey will be required to confirm the presence of Shield-backed trap-door spider burrows within areas proposed to be cleared. Exclusion areas measuring 50 m in radius from each of the known burrows and 200 m in radius from each of matriarchal clusters of burrows are imposed as a condition on the permit.
- Malleefowl (*Leiopoa ocellata*) is likely to occur in the application area as indicated by the presence of inactive mounds and suitable habitats within the application area and immediate vicinity. Clearing may impact on this species and associated habitat. This impact can be minimised and mitigated through the avoidance of clearing around identified mounds. A pre-clearing survey to identify the active and non-active mounds is required as a condition on the permit. Clearing is prohibited within 50 metres of any inactive and active mounds.
- A survey over the application area did not observe the occurrence of other conservation significant fauna species including Chuditch (*Dasyurus geoffroii*), Arid Bronze Azure Butterfly (ABAB) (*Ogyris subterrestris petrina*), Desert hairstreak butterfly (*Jalmenus aridus*), Central long-eared bat (*Nyctophilus sp*) and Peregrine Falcon (*Falco peregrinus*). However, the habitats for these fauna species may occur within the areas proposed to be cleared. A permit condition requiring that slow, progressive, one-directional clearing be undertaken towards remnant vegetation and that the clearing of large trees be avoided would minimise and mitigate the impacts of clearing on these fauna species.
- Clearing will potentially remove *Eremophila acutifolia* (Priority 3) individuals which were identified in abundance within the application area and broader survey area. The potential removal of 1,581 plants from the 21,395 plants identified (representing approximately 7.39 % of the local population), is not considered to represent a significant impact at a local or regional scale. The demarcation of the clearing area can further minimise impact by avoiding inadvertent clearing of priority flora individuals and is required as a condition on the permit.
- Clearing may introduce and spread weeds, which could impact on the quality of the adjacent vegetation and habitat values within the Karamindie State Forest and Yallari Timber Reserve conservation areas located approximately 200 m north and west of the application area. Stringent weed control and management is required as a condition to the permit.

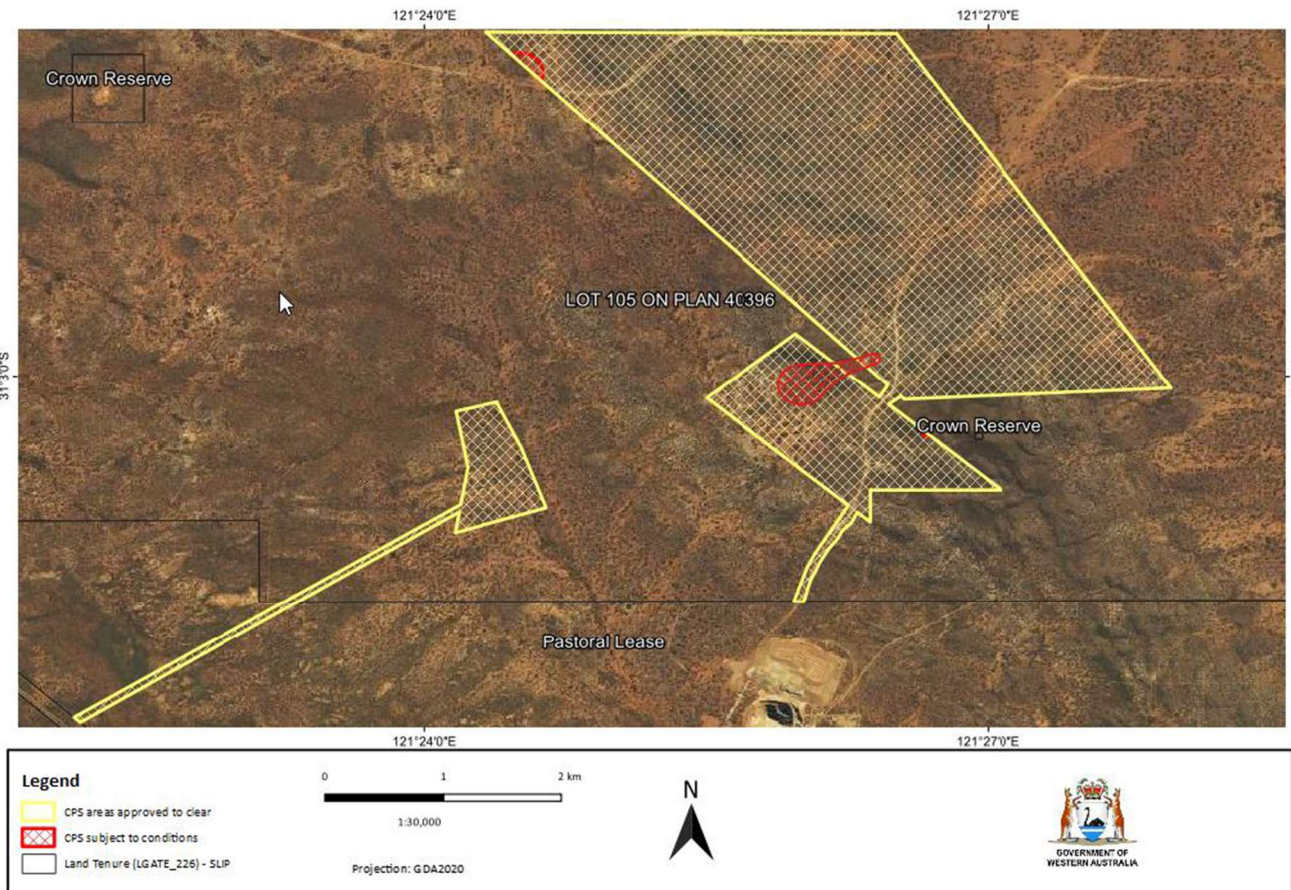
After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable or long-term adverse impacts on environmental values including those values within the nearby conservation areas. Potential impacts on the above environmental values can be minimised and managed to unlikely lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing
- take hygiene steps to minimise the risk of the introduction and spread of weeds
- undertake pre-clearing surveys of suitable habitat for malleefowl mounds and shield-backed trapdoor spider burrows

- apply adequate buffers to identified trapdoor spider burrows and active and inactive malleefowl mounds
- undertake slow, progressive, one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity
- undertake revegetation and rehabilitation of areas no longer required for mineral exploration purposes.

**1.5. Site map**



**Figure 1.** Map of the application area

The areas cross-hatched yellow indicate the areas authorised to be cleared under the granted clearing permit. The areas cross-hatched red indicates areas within which clearing activities must not be undertaken

**2 Legislative context**

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)



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

The key guidance documents which inform this assessment are:

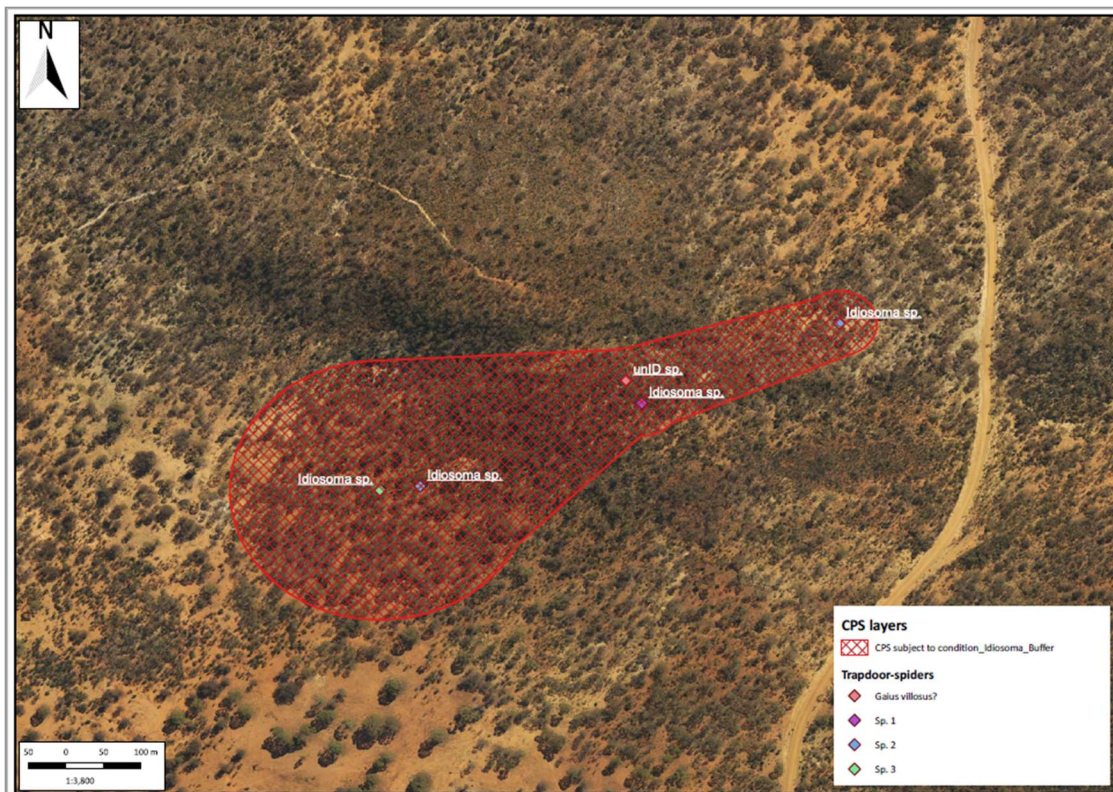
- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- *Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- *Technical guidance – Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

### 3 Detailed assessment of application

#### 3.1. Avoidance and mitigation measures

The applicant has used the detailed flora and fauna surveys performed over the area as a guidance to minimise environmental impacts. For example, to minimise impacts on fauna species and habitats, the applicant has committed to the avoidance of clearing within a nominal buffer distance to known shield-backed trapdoor spider burrows and malleefowl mounds.

During assessment, the applicant expressed a commitment to create an additional buffer area to avoid impacts on *Idiosoma sp* burrows and the mixed eucalyptus woodlands over sclerophyll shrubland on undulating hills habitat type, depicted as the blue shaded area in Figure 2 below. In doing so, further habitat fragmentation will be prevented which will assist in the conservation of these populations.



**Figure 2.** Additional buffer area committed by the applicant to protect *Idiosoma sp* and the mixed eucalyptus woodlands over sclerophyll shrubland on undulating hills communities and prevent habitat fragmentation (MRL, 2023)

The applicant has an Environmental Management System (EMS) which will be applied to the proposed clearing and exploration activities. This system includes awareness training, plans, procedures and forms to avoid, minimise and ensure the effective management of environmental and heritage values (MRL, 2022).

The Delegated Officer was satisfied that the applicant has undertaken reasonable measures to avoid and minimise potential impacts of the proposed clearing on environmental values.

### 3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix B) identified that the impacts of the proposed clearing present a risk to fauna, priority flora and land resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

#### 3.2.1. Fauna – Principle (b)

Available databases indicate that four conservation significant fauna species have been recorded from the local area (20 km radius of the application area). The number of records is likely to reflect the limited extent of surveys which have been conducted within the local area. A desktop assessment by Bamford Consultant Ecologists (BCE) determined that the survey area of 7,882 ha, including the application area, could provide habitat for 33 conservation significant fauna species. Subsequently, a fauna survey and assessment were performed between 2019 and 2021 in support of the clearing proposal (BCE, 2022).

The survey targeted Vegetation and Substrate Associations (VSAs) within the application area provide fauna habitats for the following species; malleefowl (*Leiopoa ocellata*), chuditch (*Dasyurus geoffroii*), Arid Bronze Azure Butterfly (ABAB) (by opportunistic searching for associated Camponotus ants in smooth-barked eucalypts) and Shield-backed Trapdoor Spiders (*Idiosoma sp.*) over the application area. Excerpts of the Fauna Survey and Assessment are presented in Appendix D.

A total of three reptiles, 34 birds, two native mammals and one introduced mammal were identified in the 2021 survey. The survey identified the following conservation significant fauna species and habitats:

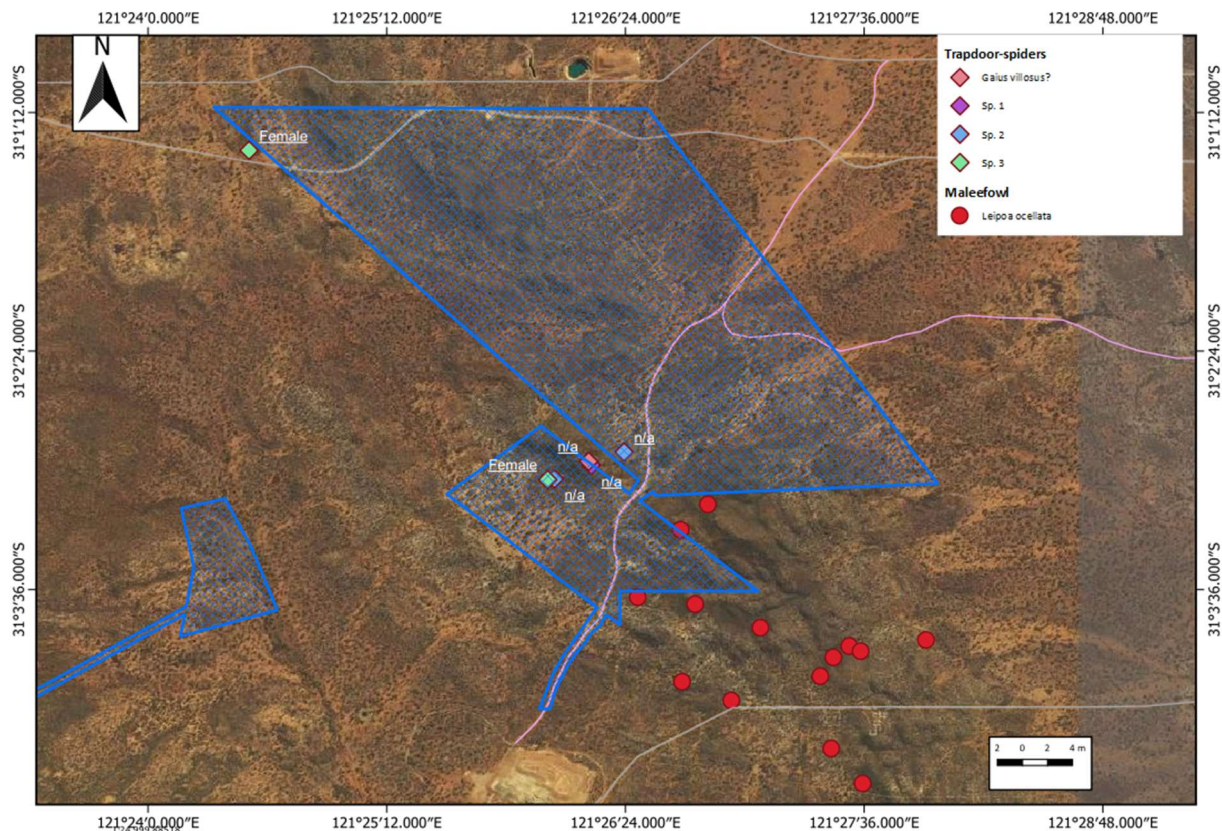
##### **Shield-backed trapdoor spiders (*Idiosoma sp.*) –**

Seven burrows of three identified taxa and one unidentified taxa of shield-backed trapdoor spiders (*Idiosoma sp.*) were found within the application area and immediate vicinity. Two of these burrows are matriarchal clusters of seven (7) and twenty (20). Locations of the burrows are depicted in Figure 3 below.

*Idiosoma sp.*, also known as the shield-backed trapdoor spider, is a large spider with females up to 30 mm in body length and males up to 18 mm in body length. The species is easily recognisable by the distinctive structure of the abdomen. The abdominal cuticle or skin is thick and hard. The end of the abdomen is flattened and shield-like, and its sides are deeply grooved giving them a rugose, corrugated appearance (DEWHA, 2010). The population size of the species is not known (DEC, 2009).

The shield-back spider typically inhabits clay soils of eucalypt woodlands and acacia vegetation and relies heavily on leaf-litter and twigs to build its burrow (Main, 1996; 2003). The species is very well adapted for life in semi-arid habitats and lives in burrows that are tubular and approximately 20–30 cm deep (Main, 1992). The burrow is deep enough to ensure that air in the lower burrow remains humid and relatively cool in summer. Females spend their entire life in the burrow or within its proximity. Gene flow is therefore facilitated by male biased dispersal, estimated to be less than 500 m (Main, unpublished data), as only males leave their burrows in search of females. The species aestivates (becomes dormant) during the drier months of the year from November to February. Trapdoor spiders are long lived, some female trapdoor spiders are known to live for over 30 years and many may be at least 20 years old.





**Figure 3.** Identified *Idiosoma* sp. burrows and *Leiopoa ocellata* (Malleefowl) mounds within and adjacent to the application area (BCE, 2022).

*Idiosoma nigrum* is classified as Vulnerable under the EPBC Act and Endangered under the BC Act. DBCA (2023) provided advice in relation to the impacts of the proposed clearing on Shield-backed trapdoor spiders and concurred with BCE's 2022 Mt Marion Fauna Assessment, that the *Idiosoma* species recorded within the application area and nearby are most likely a priority species, either being the Coolgardie shield-backed trapdoor spider (*Idiosoma intermedium* - Priority 3), or Central Eastern Wheatbelt shield-backed trapdoor spider (*Idiosoma mcnamarai* - Priority 1), and therefore should be considered conservation significant.

Large knowledge gaps regarding the ecology and current distribution of trapdoor spiders within Western Australia currently exist, however, DBCA notes that substantial evidence indicates a significant decline across the board (*pers. comm.*, Mark Harvey, WA Museum, 30 May 2023 in DBCA, 2023). There is no recovery plan for the shield-backed trapdoor spider species that are likely to occur within the proposed clearing area, however, DBCA (2023) asserted that advice for *Idiosoma nigrum* could be substituted for these species as they face similar threats. A Priority Action listed in the Approved Conservation Advice for *Idiosoma nigrum* is to "minimise adverse impacts from land use (especially mining) at known sites". In addition, the *Shield-Backed Trapdoor Spider (Idiosoma Nigrum) Conservation Plan 2008-2013* notes that "*I. nigrum* possess characteristics that make them more susceptible to threats than other wheatbelt fauna. These include poor dispersal capabilities, confinement to disjunct habitats and low fecundity. These characteristics require a similar management approach to the conservation actions undertaken for Declared Rare Flora".

In the absence of national conservation advice regarding the sufficient buffer size for trapdoor spiders, DBCA (2023) advises that buffers should be applied on a case-by-case basis and should consider the species, site and activity proposed. For trapdoor spider's burrows, the buffer area should be large enough to reduce potential impact from the proposed activities as well as allowing for an adequate supply of prey and for males to locate female burrows. The impact of exploration disturbance (particularly vibrations from the drill) on these spiders is not well understood, however given that exploration activities are meant to be short-term and low impact, suitable buffers should be adequate to



mitigate impacts for this proposal. DBCA (2023) recommends a 50 m buffer for individual burrows and a larger buffer, of at least 200 m, to be applied to any matriarchal clusters of burrows. Note that a buffer should be applied to all burrows present, not only to the burrows identified during the survey, therefore a pre-clearance survey should be undertaken to identify and avoid burrows in the path of clearing.

### **Leipoa ocellata (malleefowl)**

Two inactive malleefowl mounds were identified just outside of the application area perimeters in the most recent survey (BCE, 2022). One of the mounds was identified as being 'recent' and the other 'old'. No malleefowl were seen during the survey. Previous surveys (2016 and 2019) recorded several mounds south of the application area, the closest being approximately 1 km to the south (Bamcroft and Bamford, 2020 in BCE, 2022). The findings suggest that habitat for malleefowl occurs in the area (including the application area), and that the fauna may reside or at least be a regular visitor to the area (BCE, 2022).

The National Malleefowl Recovery Plan states that this fauna species is found principally in the semi-arid to arid zone in shrublands and low woodlands dominated by mallee (Frith 1962a) and associated habitats (Malleefowl Recovery Plan, 2015) such as Broombush (*Melaleuca uncinata*) (Woinarski 1989a; Woinarski 1989b) and Scrub Pine (*Callitris verrucosa*). In Western Australia they are also found in some shrublands dominated by acacia, and occasionally in woodlands dominated by eucalypts such as Wandoo (*E. wandoo*), Marri (*Corymbia calophylla*) and Mallet (*E. astringens*) (Benshemesh, 2007). The *National Recovery Plan for Malleefowl Leipoa ocellata* notes that habitat loss has been and continues to be the major factor in the decline of malleefowl in southern Australia. Habitat fragmentation and isolation and predation are also listed as major threats to malleefowl.

The Eucalypt woodlands within the application area represent the typical habitat of the fauna species. DBCA (2023) in their advice suggests that malleefowl use the area for breeding (malleefowl mounds were recorded within and near the proposed clearing area) and are also likely to use the area for foraging purposes. Malleefowl in the area breed during the months of September through to January.

DBCA (2023) advises that given exploration activities are intended to be short-term and low impact, and given the malleefowl is a mobile species that has the ability to transit to other areas without assistance, the impact of the proposed clearing is unlikely to be significant at a species level. However, the proposed clearing is likely to result in the loss of 120 ha of potential foraging habitat, contribute to the degradation of habitat left behind and increase accessibility of the area to feral predators (foxes and feral cats) through the clearing of tracks.

The high number of malleefowl records in the local area and the relatively even distribution of the records across the landscape indicate that the population is not presently restricted to certain areas. Pre-clearing survey for malleefowl mounds can identify locations of active and inactive mounds prior to and at the time of clearing to avoid and mitigate impacts on the fauna species and its habitat. Providing buffers around identified mounds, particularly the active ones, may be appropriate to reduce risk of vehicle strikes and potential abandonment of nests through this proposal. In the absence of conservation advice regarding the buffer, DBCA (2023) suggests that 50 m buffers should be adequate for the purpose. It is also important to preserve any connectivity of the active mound area to broadscale areas of native vegetation to facilitate movement through the natural landscape for parents (e.g. for foraging, while tending the mound) and offspring (for dispersal). Noting that malleefowl may use inactive or old mounds in subsequent years, clearing of inactive mounds should be avoided. Buffering any inactive and old mounds and maintenance of connectivity between the mounds can further mitigate impacts on the long-term survival of this fauna species.

### **Chuditch (*Dasyurus geoffroi*)**

No chuditch were observed during the survey, however, it was determined that suitable habitat for chuditch was present and foraging chuditch may be present within the application area. DBCA (2023) advised that suitable habitat for chuditch is present although the likelihood of occurrence was deemed

low due to a lack of contemporary records in, or near the survey area. DBCA (2023) noted that threatened fauna values in adjoining lands show contemporary records 120 km to 160 km away. As suggested by the fauna assessment of BCE (2022), the area is likely to be a marginal habitat for nearby populations and is unlikely to currently support significant populations. Therefore, the proposed clearing is unlikely to have a significant impact on chuditch.

If chuditch dens are present and clearing occurs during denning season (August to October), a Section 40 Authorisation under the *Biodiversity Conservation Act 2016* for the potential take is required.

### **Other fauna species**

The vegetation over the application area comprises mainly of Eucalypt woodlands. The fauna survey identified seven (7) VSAs over the larger survey area (listed in Appendix D), three of which occur within the application area, namely:

- Mixed Eucalypt woodland over sclerophyll shrubland on undulating hills
- Acacia shrubland on slopes with scattered Eucalypts over rocky loam
- Open to closed Eucalypt woodland or Mallee over mixed shrubland on flats.

The VSAs over the application area may provide habitats to a range of fauna assemblages typical of the Coolgardie region and Goldfields eucalypt woodlands. For example, fauna that occur in eucalypt woodlands throughout the region are likely to utilise the project area and hollow-bearing trees in the woodlands may provide important nesting opportunities.

Although Arid Bronze Azure Butterfly (ABAB) and the associated *Camponotus* ants were not identified during the most recent survey over the application area, the preferred habitat for the ants and ABAB is present, that being smooth-barked eucalypts. Similarly, the habitats preferred by *Jalmenus aridus* (Desert hairstreak butterfly) including *Senna artemisioides subsp. filifolia* and *Acacia tetragonophylla* occur within the application area. Clearing of mature habitat trees should be avoided. The Central long-eared bat is known to inhabit mature trees with hollows and may be present within the application area given that mature, hollow-bearing trees were recorded within the application area during the BCE survey (2022). It is important that clearing of these trees is avoided.

### **Conclusion**

Given the above, any direct impacts of clearing on conservation significant fauna species may be significant unless fauna management measures are in place. Placing relevant fauna management conditions on the permit can mitigate impacts on fauna species.

### **Conditions:**

To mitigate potential impacts on fauna species, the following conditions are imposed on the permit:

- Slow, directional clearing towards adjacent vegetated areas to allow fauna to move to the nearby vegetation ahead of clearing
- A pre-clearance survey to be undertaken in areas of suitable habitat to identify all malleefowl mounds and shield-backed trapdoor spider burrows that have potential to be disturbed by the project activities.
- A minimum buffer of 50 m to be applied to all malleefowl mounds and individual spider burrows
- A minimum buffer of 200 m to be applied to any matriarchal clusters of burrows.
- Avoid clearing of mature, smooth-barked eucalypts and hollow-bearing trees.

### **3.2.2. Biodiversity and Flora – Principles (a) and (c)**

As discussed in Section 3.2.2. above, seven (7) VSAs were identified over the survey area, three of which occurred within the application area.

These VSAs potentially provide habitats to a range of fauna species known to inhabit the Coolgardie region and Goldfields eucalypt woodlands that may reside, or at least forage and disperse into the

application area as discussed in Section 3.2.1. Although potentially containing habitat for conservation significant fauna species, the composition and vegetation types within the application area are typical of the local region and not considered to be unusually diverse (NVS, 2021).

*Serengia extasia*, which was listed as a Threatened flora species at the time of the surveys in 2019 and 2021 was recorded in the application area. However, this flora species has since been delisted.

The application area contains the Priority flora species *Eremophila acutifolia* (Priority 3). *E. acutifolia* was identified in abundance within the application area and beyond in the reconnaissance survey conducted in 2019 and the targeted survey conducted in October 2021 (NVS, 2021). *E. acutifolia* was recorded in Quadrats 30 and 31 (vegetation group B) where the populations comprised dominant lower stratum species.

This species is both widespread and in large numbers throughout the local and regional area and is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs. Using data from a survey in 2019 to compare local numbers of *E. acutifolia* with those recorded in the most recent survey, clearing within the application area may affect approximately 7.39% of the local population (NVS, 2021). Although removal of these individuals is unlikely to have a significant impact on the conservation of the flora species at the species level, care should be taken to limit the risk to the potential cumulative impacts on the species within the area (DBCA, 2023).

Desktop assessment suggested that *Acacia websteri* (P1), *Alyxia tetanifolia* (P3), *Phebalium clavatum* (P2) and *Styphelia rectiloba* (P3) have been recorded within the local area. DBCA (2023) advised that the application area does not appear to be the habitat currently known to support *A. websteri*, *A. tetanifolia*, *P. clavatum* and *S. rectiloba*. Consequently, the impact of clearing on these flora species is unlikely significant.

#### Conclusion:

Given the above, the proposed clearing is therefore unlikely to be impacting on an area of high biodiversity value. The impacts of clearing on the conservation of *E. acutifolia* is considered unlikely to be significant.

#### Condition:

To mitigate potential impact on the priority flora species, the demarcation of clearing areas to avoid inadvertent clearing of priority flora is imposed as a condition on the permit.

### **3.2.3. Conservation area – Principle (e)**

Lot 105 and Lot 95 are immediately adjacent the Karamindie State Forest and Yallari Timber Reserve, both protected under the CALM Act. These conservation areas are reserved for recreation, sustainable timber, and water production and for wildlife and landscape conservation. The application area is separated from the Karamindie State Forest by 200 m, while the Coolgardie – Esperance Highway separates the application area and from the Yallari Timber Reserve. Given the above, the proposed clearing for exploration activities is unlikely to have a direct impact on these conservation areas. However, the clearing and associated exploration activities may spread or introduce weeds and other pathogens which impact the environmental values within these conservation areas. Stringent weed management conditions have been imposed on the permit to mitigate this impact.

#### Conclusion:

Given the above, clearing is not considered likely to have a direct impact on nearby conservation areas. Clearing may contribute to indirect impacts on nearby conservation areas through the introduction and spread of weeds. Taking steps to minimise the risk of the introduction and spread of weeds can mitigate the potential impact.

#### Condition:



A weed management condition has been imposed on the Permit.

### **3.2.4. Land and water resources – Principles (f), (g) and (i)**

#### Assessment

There are no permanent watercourses or wetlands within the application area (GIS Database). There are numerous minor ephemeral watercourses within the permit boundary (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The vegetation types mapped within the application area are not associated with riparian ecosystems. The proposed clearing is therefore unlikely to impact on vegetation associated with watercourses, or the quality of surface water.

The application area is mapped within the Goldfields Groundwater area. Groundwater in the region is typically 50 m below ground level and is saline or hypersaline. The depth of groundwater in the area is not known, however, noting that the purpose of clearing is mineral exploration, impacts to the groundwater quantity and quality is considered minimal, provided standard exploration guidelines are followed (DMIRS, 2002).

The region is characterised by hot summers with low rainfall and high evaporation rates. Loose soils and dust at bare ground could be prone to erosion. Given the low rainfall and absence of waterlines or bodies within the application area, the risk of water erosion is considered low. The loose soils, however, could be affected by the wind and deposited onto the vegetation and environment nearby. Provided the clearing is not concentrated in one area, the proposed clearing of 120 hectares across a total footprint of 1,311 is not likely to cause appreciable land degradation. Potential impacts from land degradation can be further mitigated through the implementation of rehabilitation.

The vast extent of vegetation cover (greater than 98%) and Good to Very Good condition (Trudgen, 1991) of vegetation within the application area, can further mitigate the risk associated with wind erosion and dust deposition.

#### Conclusion

Based on the above assessment, the proposed clearing will not result in appreciable land degradation.

#### Conditions

A revegetation and rehabilitation condition has been imposed on the permit.

### **3.3. Relevant planning instruments and other matters**

Lot 105 and Lot 94 are freehold properties with special land category area, EEL, Greater Hamptons, Northern Hamptons Area 53. Freehold land grants the landowner the right to retain the mineral rights, and therefore the provisions under the *Mining Act 1978* (Mining Act) do not apply. Exempt locations such as EEL 53 are governed under the *Mining on Private Property Act 1898* (Mining Act, Section 27(2)).

Lot 105 is owned by Northern Star (Hamptons Gold Mining Areas) Limited (NS Hamptons) and leased to Reed Industrial Minerals Ltd (RIM) which is co-owned by Mineral Resources Limited (MRL). The proposed project is operated by Process Minerals International Pty Ltd (PMI), a subsidiary of MRL. An authorisation for RIM, MRL and PMI to access Lot 105 has been provided by NS Hamptons and was attached to the clearing permit application. Lot 94 is held by RIM and retains the Exploration Licence (E150/1599).

Both Lots 105 and 94 are within the Goldfields Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RiWI Act). The tenement's conditions specify that the taking of groundwater and the construction or altering of any well is prohibited without licences issued by DWER. The Department's Natural Resource Management – Swan Avon Region, which manages the requirements under the RiWI Act, advised that since the mineral exploration activities do not require water abstraction, a licence to abstract water under the RiWI Act is not required.

The Department invited the Shire of Coolgardie to provide comments on the proposed clearing, however, no comment was provided.

A Section 40 Authorisation under the BC Act for the potential take (including anything that may cause or permit take) of threatened fauna may be required if:

- malleefowl mounds are to be disturbed or removed
- works are to occur within 50 m of an active (in use) malleefowl mound, during the months of September through to January
- further survey identifies threatened fauna within the proposed clearing footprint
- chuditch dens are present and clearing occurs during denning season (August to October).

The application area does not include registered Aboriginal heritage sites.

**End**

## Appendix A. Site characteristics

### A.1. Site characteristics

Characteristic	Details
Local context	<p>The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is located approximately 35 kilometres (km) south of Kalgoorlie, in the Coolgardie Bioregion and the Eastern Goldfields Subregion (COO03) of Western Australia. The dominant land use within the Eastern Goldfields subregion is grazing, with smaller areas of crown reserves, mining, freehold, and conservation. The application area is just north of an existing mining infrastructure, surrounded by other mine leases, crown reserves, and conservation areas.</p> <p>Spatial data indicates the local area (20-kilometre radius from the centre of the area proposed to be cleared) retains approximately 98 per cent of the original native vegetation cover</p>
Ecological linkage	No formal ecological linkage has been mapped for the application area.
Conservation areas	The application area is not within any conservation area, however, is within close proximity of the Karamindie State Forest (northwest), and the Yallari Timber Reserve (southwest). There are five other conservation areas within the local area.
Vegetation description	<p>The Eastern Goldfields subregion is dominated by Mallees, Acacia thickets and shrub heaths on sandplains. Diverse Eucalyptus woodlands occur around salt lakes, on ranges, and in valleys and dwarf shrublands of samphire are common in salt areas (NVS, 2022).</p> <p>Vegetation in the subregion has been mapped only to the vegetation association level. Accordingly, vegetation within the application area and surrounds has been mapped as follows:</p> <ul style="list-style-type: none"> <li>• Beard Vegetation Association 128, Bare areas and rock outcrops – 99.98%</li> <li>• Beard Vegetation Association 9, Medium woodland; coral gum (<i>Eucalyptus torquata</i>) &amp; Goldfields blackbutt (<i>Eucalyptus lesouefii</i>)– 98.29%</li> <li>• Beard Vegetation Association 936, Medium woodland; salmon gum – 99.32 %</li> <li>• Beard Vegetation Association 1413, Shrublands; <i>Acacia</i>, <i>Casuarina</i> &amp; <i>Melaleuca</i> thicket – 99.77 %</li> </ul> <p>The mapped vegetation types retain approximately 99.98, 98.29, 99.32 and 99.32 per cent of the original extent, respectively (Government of Western Australia, 2019).</p> <p>A vegetation survey over the application area (NVS, 2022) identified eleven (11) vegetation groups occurring within the broader survey area, as follows:</p> <ul style="list-style-type: none"> <li>• A - Transitional <i>Eucalyptus</i> Woodland over mixed shrubland (Type A)</li> <li>• B - Mixed <i>Eucalyptus</i> woodland over sclerophyll shrubland on undulating hills</li> <li>• C - <i>Acacia acuminata</i> shrubland with emergent <i>Eucalyptus griffithsii</i></li> <li>• D - Open <i>Eucalyptus salmonophloia</i> woodland</li> <li>• G - <i>Eucalyptus lesouefii</i> and <i>Eucalyptus gracilis</i> on rocky hill slopes</li> <li>• H - Mixed <i>Eucalyptus</i> over <i>Melaleuca sheathiana</i> shrubland</li> </ul>



Characteristic	Details
	<ul style="list-style-type: none"> <li>• I - <i>Eucalyptus ravida</i> woodland</li> <li>• K- Mixed <i>Eucalyptus</i> woodland over sclerophyll shrubland with <i>Eremophila acutifolia</i> (P3) on undulating hills</li> <li>• N- <i>Eucalyptus gracilis</i> woodland</li> <li>• R - <i>Eucalyptus griffithsii</i> woodland</li> <li>• X - <i>Acacia quadrimarginea</i> shrubland on undulating hills</li> </ul> <p>Approximately 80 percent of vegetation within the application area comprises of Type R vegetation (<i>E. griffithsii</i> woodland).</p> <p>Excerpts of the survey, descriptions and map of vegetation types are available in Appendix D.</p>
Vegetation condition	<p>The vegetation survey (NVS, 2022) indicates the vegetation within the proposed clearing area is in Good to Very Good condition (Trudgen, 1991).</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix C. Excerpts of the survey descriptions and mapping are available in Appendix D.</p>
Climate and landform	<p>The Eastern Goldfields subregion is characterised by undulating plains, greenstone ridges, playa lakes, and scattered exposed bedrock. The subregion lies on the Yilgarn Craton's Eastern Goldfields Terrain and comprises of gently undulating plains interrupted in the west by Archaean greenstone ridges and low hills, while the east contains a horst of Proterozoic granulite. In the western half there are a series of large playa lakes which are remnants of an ancient major drainage line.</p> <p>The region is characterised by hot summers and cold winters with low rainfall distributed throughout the year (approximately 270 millimetres (mm) per year) (BoM, 2021). February and June recorded the highest rainfall.</p>
Soil description	<p>The project is located across the Kambalda and Norseman Zones in the Kalgoorlie Province soil landscape region of the Department of Industries and Regional Development (DPIRD) system, which has been described at the regional level as undulating plains (with some sandplains, hills and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton (Tille, 2006). The dominant soil type is calcareous earth, which covers most of the plains and greenstone areas (CALM, 2002).</p> <p>DPIRD Soil landscape mapping identified seven soil landscape types in the application area, as follows:</p> <ul style="list-style-type: none"> <li>• Norseman Zone – My154 : Undulating country on acid volcanic rocks and sedimentary</li> <li>• Kambalda Zone – BB5: Rocky ranges and hills of greenstones-basic igneous rocks – comprises most of the application and survey area</li> <li>• Kambalda Zone – My154 : Undulating country on acid volcanic rocks and sedimentary materials</li> <li>• Kambalda Zone –265Mx: Gently undulating valley plains and pediments; some outcrop of basic rock</li> <li>• Norseman Zone – Mx41: Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments.</li> </ul>
Land degradation risk	<p>The calcareous loamy soils of the application area are prone to wind erosion when ground cover vegetation is removed. Being in the arid zone, the risk of water erosion is low. The Australian Soil Resource System indicates that the</p>

Characteristic	Details
	application area has “no known Occurrence” of acid sulphate soils (GHD, 2018).
Waterbodies	The desktop assessment and aerial imagery indicate that some non-perennial watercourses occur within the application area, however, no permanent waterbodies are present.
Hydrogeography	The application area is within the Goldfields Groundwater Area proclaimed under the RIWI Act.
Flora	There are several records of conservation significant flora species within the local area. A flora and vegetation survey undertaken within the application area identified abundant records of <i>Eremophila acutifolia</i> (P3) within the application area and broader survey area.
Ecological communities	No PEC/TEC is mapped or identified within the application area. The nearest PEC is approximately 66 km from the application area.
Fauna	A fauna survey and assessment was conducted within the application area (BCE, 2022). The survey recorded two inactive malleefowl mounds, while previous survey the application area and vicinity also recorded several inactive malleefowl mounds. The most recent survey also identified Peregrine falcon and Shield-backed trapdoor spiders burrows ( <i>Idiosoma</i> sp) in five locations, with two being matriarchal clusters. Although Chuditch, Carpet python and Central Long-eared bat were not identified during the survey, the survey concluded that suitable habitats for the fauna species exists within the application area.

## A.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Coolgardie Bioregion	12,912,204.35	12,648,491.39	97.96	2,114,637.29	16.37
Eastern Goldfields Subregion	5,058,246.73	5,031,528.12	99.47	436,641.81	8.63
Vegetation complex - Beard vegetation association					
9	235,047.15	229,757.07	97.75	18,981.18	8.08
128	26,871.74	26,853.58	99.93	1,754.63	6.53
936	310,897.74	308,459.61	99.22	13,509.51	4.35
1413	107,974.55	107,727.82	99.77	8,118.00	7.52
Local area (calculation - delete if not required)					
20km radius	1,792,285,391	1,763,609,173	98.4	-	-
*Government of Western Australia (2019a)					
**Government of Western Australia (2019b)					

### A.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
<i>Acacia websteri</i>	P1	Y	Y	Y	0.00	4	Y
<i>Alyxia tetanifolia</i>	P3	Y	Y	Y	19.52	80	Y
<i>Eremophila acutiflora</i>	P3	Y	Y	Y	0.0	21,395	Y
<i>Phebalium clavatum</i>	P2	Y	Y	Y	0.00	1	Y
<i>Styphelia rectiloba</i>	P3	Y	Y	Y	16.49	2	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

### A.4. Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information, impacts to the following conservation significant fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Year of record (most recent)	Are surveys adequate to identify? [Y, N, N/A]
<i>Calidris acuminata</i> (Sharp-tailed sandpiper)	MI	Y	Y	17.93	1	1980	Y
<i>Idiosoma</i> sp (back-shielded trapdoor spiders)	VU	Y	Y	0	7	2021	Habitat and individuals were identified in survey
<i>Leipoa ocellata</i> (mallee fowl)	VU	Y	Y	0	2	2021	Habitat was identified in survey
<i>Ogyris subterrestris petrina</i> (arid bronze azure butterfly)	CR	Y	Y	16.98	12	1991	Y
<i>Tringa brevipes</i> (grey-tailed tattler)	P4	Y	Y	18.50	1	2017	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

## A.5. Ecological community analysis

Community name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
The Mount Belches <i>Acacia quadrimarginea</i> / <i>Ptilotus obovatus</i> (banded ironstone formation)	P3	N	N	N	66	1	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

## Appendix B. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
<b>Environmental value: biological values</b>		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>The fauna and flora surveys conducted within the application area identified the presence of habitats that are suitable for several conservation significant fauna and flora species.</p> <p>Pre-clearing surveys are required for Shield-backed trapdoor spiders (<i>Idiosoma sp</i>) and Malleefowl (<i>Leipoa ocellata</i>). The identification of these species or suitable habitat features would enhance the biodiversity values within the application area.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (b):</u> "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."</p> <p><u>Assessment:</u></p> <p>A fauna survey was conducted by Bamford Consultant Ecologist (BCE, 2022) which identified several shield-back trapdoor spider burrows and inactive malleefowl mounds within the application area.</p> <p>Clearing of native vegetation has the potential to impact on habitat for conservation significant fauna, however, management conditions have been applied which require pre-clearing survey for the Shield-backed trap-door spider and malleefowl and their habitat, as well as providing exclusion areas around identified burrows and mounds.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p>	Not likely to be at variance	No



Assessment against the clearing principles	Variance level	Is further consideration required?
<p>The area proposed to be cleared does not contain threatened flora species listed under the BC Act.</p> <p>A targeted flora survey in 2021 identified <i>Serengia estacia</i> which was previously listed as a Threatened flora species (NVS, 2021), but has since been delisted.</p>		
<p><b>Principle (d):</b> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain species indicative of a threatened ecological community. The nearest mapped priority ecological community is located 66 km east of the application area.</p>	Not likely to be at variance	No
<b>Environmental value: significant remnant vegetation and conservation areas</b>		
<p><b>Principle (e):</b> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the mapped vegetation types and native vegetation within the local area is in the excess of 98 percent, which is consistent with the national objectives and targets for biodiversity conservation in Australia.</p> <p>The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	Not at variance	No
<p><b>Principle (h):</b> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>The application area is within close proximity of the Karamindie State Forest and Yallari Timber Reserve. Clearing may spread or introduce weeds and other pathogens which may impact the environmental values within these conservation areas.</p>	May be at variance	Yes <i>Refer to Section 3.2.3, above.</i>
<b>Environmental value: land and water resources</b>		
<p><b>Principle (f):</b> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>No permanent watercourses or wetlands are recorded within the application area. The non-perennial watercourses in the application area are only likely to flow under heavy rainfall conditions. The vegetation types identified the application are not associated with riverine ecosystems. The proposed clearing is unlikely to impact vegetation associated with watercourses or wetlands.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils may be susceptible to wind erosion. Noting the extent of native vegetation cover within the application area, the condition of the vegetation and the temporary nature of disturbance, the proposed clearing is unlikely to have an appreciable impact on land degradation. Potential impact of clearing is further mitigated by a rehabilitation and revegetation condition imposed on the permit.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.4, above.</i>
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>The non-permanent watercourses within the application area are only likely to flow under heavy rainfall conditions. The proposed clearing is unlikely to impact surface or groundwater quality, with no permits required under the RiWI Act.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.4, above.</i>
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.</p>	Not likely to be at variance	No

### Appendix C. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation’s ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

#### Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.

Condition	Description
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

## Appendix D. Biological surveys information excerpts

### **Flora and Vegetation Survey** (Native Vegetation Solutions, 2022)

A Detailed Flora and Vegetation Survey was conducted by Native Vegetation Solutions (NVS) over an area totalling approximately 1,439 ha. The area encompasses sections of land within the Hamptons Lease Area 53 (this application area) and portions of Exploration License E 15/1599 within which the application area is located (Figure 4). The survey was conducted in accordance with relevant EPA's Statements and Guidelines.

The survey comprised of:

#### 1) Reconnaissance Survey

A Reconnaissance Flora and Vegetation survey was conducted in the area in April 2019 comprising of:

- a) Desktop study which includes a literature review and a search of the relevant databases; and
- b) Reconnaissance survey of the subject area to verify the desktop survey, undertake low impact sampling, define vegetation groups present in the area, search for species of conservation significance and to determine potential sensitivity to impact.

#### 2) Detailed Plot Based Survey (NVS, 2021)

Vegetation mapping from the 2019 report was used in the 2021 survey for the majority of the survey area. A total of 48 hours was spent on site traversing the survey area between 7 to 15 October 2021. While a vehicle was used to reach the site, all traverses were made on foot or via a Yamaha Viking.

The scope of work for the Detailed survey included the following:

- Conduct a plot-based survey within the survey area (incorporating 20m x 20m quadrats)
- Prepare an inventory of species occurring in the study area
- Conduct PATN<sup>®</sup> analysis of quadrat-based presence/absence data
- Quantify survey intensity via a Species Accumulation Curve
- Describe the vegetation associations in the survey area
- Identify any vegetation communities or flora species of particular conservation significance
- Map broad-scale vegetation groups found within the survey area, including vegetation condition; and

- Provide recommendations, including the management of perceived impacts to flora and vegetation, particularly flora of conservation significance, within the study area

## **Results**

The Priority Ecological Communities (PEC) and Threatened Ecological Communities (TEC) search revealed no PEC/TECs within the survey area (DBCA, 2021). The survey area does not lie within or contain any Environmentally Sensitive Areas (ESA) or Conservation Reserves (DWER, 2021). No water bodies were identified within the survey area via the Clearing Permit System (CPS) Map Viewer (DWER, 2021). Eleven vegetation groups were identified during this survey, largely following topographical features and dominant species. Photographs of representative quadrats and the relevant vegetation group can be seen in Figures 5 and 6 below. Mapping of the 11 vegetation groups and conditions can be seen in the Figures 7 and 8 below. The vegetation types and extent are listed in the table below.

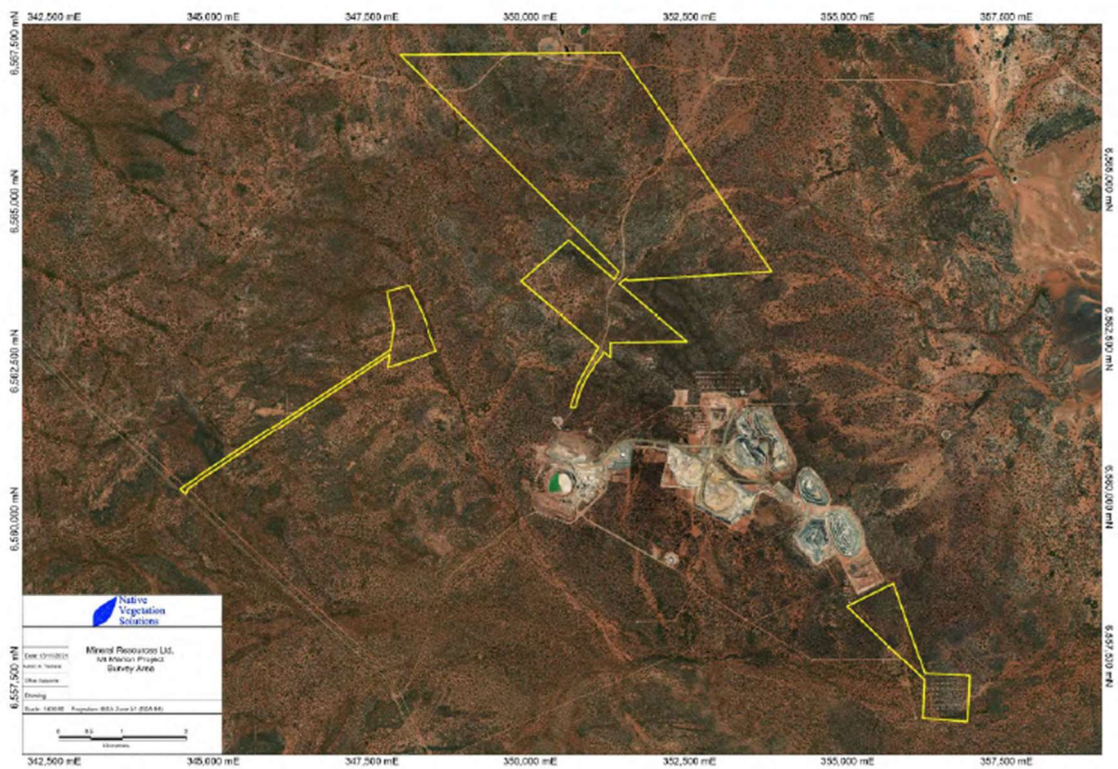
**Table 8: Vegetation Group Extent within Survey Area**

Vegetation Group	Vegetation Group Code	Quadrats	Family	Genus	Species	Area (ha)	Percentage of Survey Area (%)
Transitional <i>Eucalyptus</i> Woodland over mixed shrubland	A	Q1, Q2, Q3, Q4, Q22, Q27	20	31	75	63.12	4.39
Mixed <i>Eucalyptus</i> woodland over sclerophyll shrubland on undulating hills	B	Q5, Q6, Q7, Q26, Q28	23	31	55	62.91	4.37
<i>Acacia acuminata</i> shrubland with emergent <i>Eucalyptus griffithsii</i>	C	Q10, Q33	15	30	40	1.27	0.09
Open <i>Eucalyptus salmonophloia</i> woodland	D	Q11, Q12, Q13, Q14	13	23	50	0.42	0.03
<i>Eucalyptus lesouefii</i> and <i>Eucalyptus gracilis</i> on rocky hill slopes	G	Q16	8	14	25	3.99	0.28
Mixed <i>Eucalyptus</i> over <i>Melaleuca sheathiana</i> shrubland	H	Q17, Q18, Q19	12	21	36	64.58	4.49
<i>Eucalyptus ravidia</i> woodland	I	Q15, Q20, Q21, Q29	14	25	51	8.12	0.56
Mixed <i>Eucalyptus</i> woodland over sclerophyll shrubland with <i>Eremophila acutifolia</i> (P3) on undulating hills	K	Q30, Q31	12	18	30	21.08	1.47
<i>Eucalyptus gracilis</i> woodland	N	Q23	10	13	22	502.98	34.97
<i>Eucalyptus griffithsii</i> woodland	R	Q24, Q25	13	26	40	665.02	46.23
<i>Acacia quadrimarginea</i> shrubland on undulating hills	X	Q8, Q9, Q32	22	29	41	44.87	3.12
		<b>Total</b>	<b>31*</b>	<b>72*</b>	<b>148*</b>	<b>1438.36#</b>	<b>100#</b>

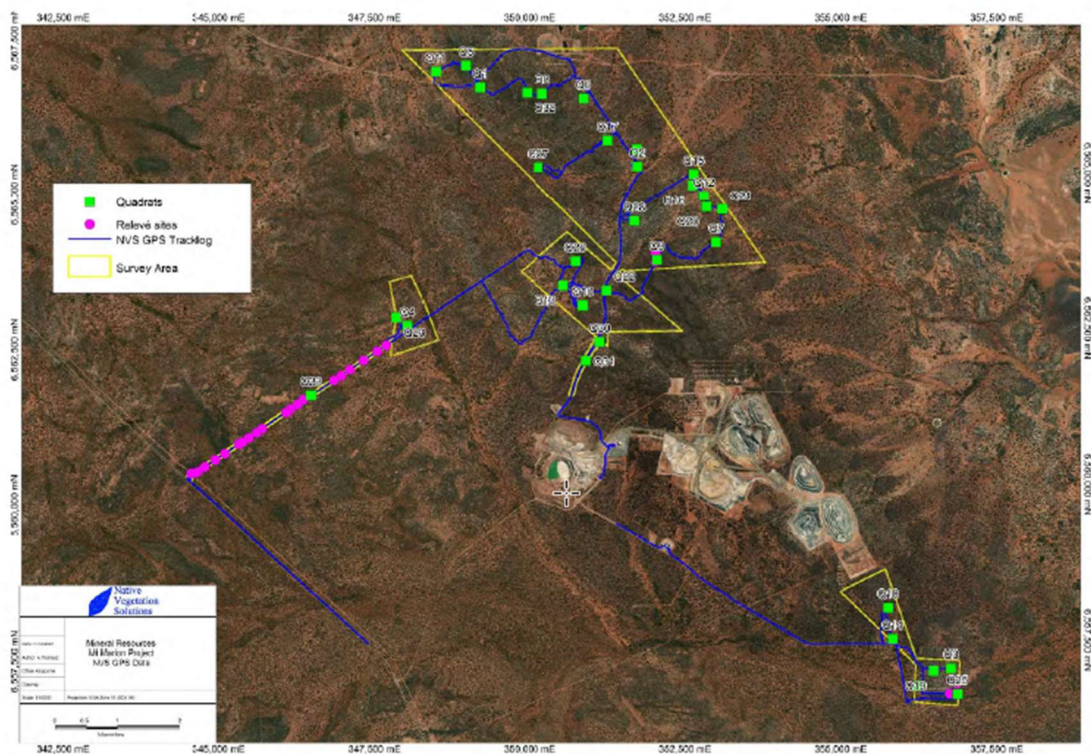
\*Denotes total recorded in the survey area (not sum of column)

# Denotes sum of column





**Figure 4.** Survey Area (NVS, 2022)



**Figure 5.** The quadrats and relevés sites

One hundred and forty-eight species were recorded within the survey area with 130 species recorded within quadrats. Thirty-one families and 72 genera were found. Of the native species, Chenopodiaceae was the highest represented family, with 27 species from 10 genera. The next best represented families were Myrtaceae and Scrophulariaceae each with 18 species. Of the 148 taxa recorded one was an



introduced weed species. *Oncosiphon suffruticosum* (Calomba daisy) was recorded in Quadrat 12. This species is not listed as a declared pest in the state of Western Australia by the Department of Primary Industries and Regional Development (DPIRD, 2021). The most common and widespread species were *Exocarpos aphyllus* which was recorded within 30 quadrats followed by *Ptilotus obovatus* and *Maireana trichoptera* which were both recorded within 26 quadrats.

There were 36 taxa recorded from within a single site, which was Quadrat 4 (Q4). There was one Priority and one Threatened flora recorded during the survey. Threatened flora *Seringia exastia* (T) was identified within the survey area and was gazetted as Threatened pursuant to Section 5(1) of the *Biodiversity Conservation Act 2016*, and as Threatened pursuant to Schedule 1 of the *Environment Protection and Biodiversity Conservation Act 1999* at the time of survey. *E. exastia*, however, has since been delisted.

Priority flora *Eremophila acutifolia* (P3) was recorded in Quadrats 30 and 31. Both populations were dominant lower stratum species. This species is both widespread and in large numbers throughout the local and regional area and is well documented by previous flora surveys. Recorded locations range from Coolgardie, Norseman, Kambalda, Widgiemooltha and Madoonia Downs. Using data from the NVS (2019) survey to compare local numbers of *Eremophila acutifolia* (P3) with the current survey area, clearing within the proposed survey area will likely affect approximately 7.39% of the local population.

Vegetation condition was generally 'Good' to 'Very Good' (Trudgen, 1991). Disturbance was present within the survey area mostly attributed to access tracks, exploration related activities and grazing.

Vegetation A



Vegetation B



Vegetation C



Vegetation D





Vegetation G



Vegetation H



Vegetation I



Vegetation N



Vegetation R

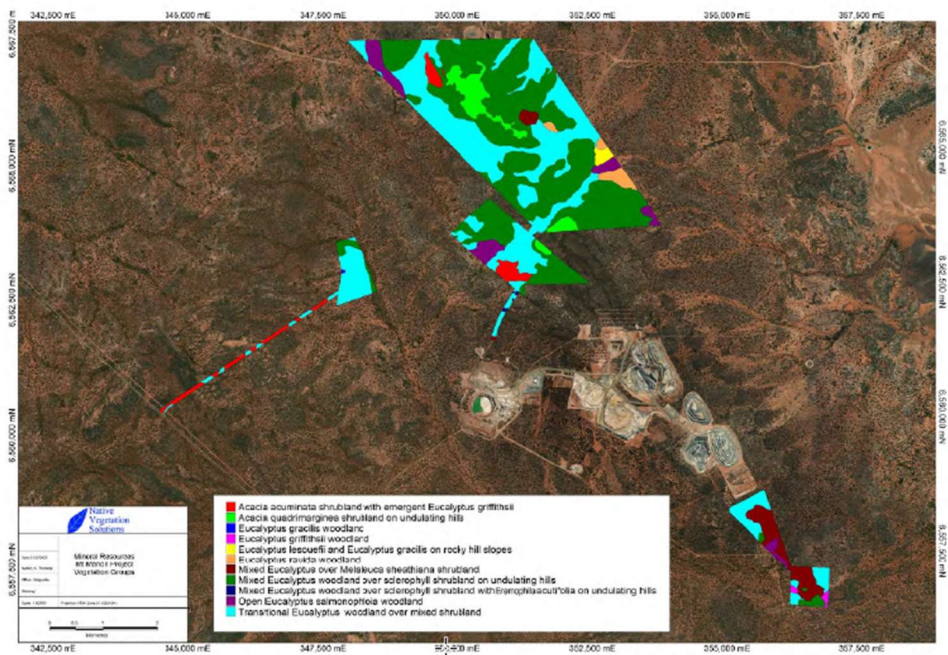


Vegetation X

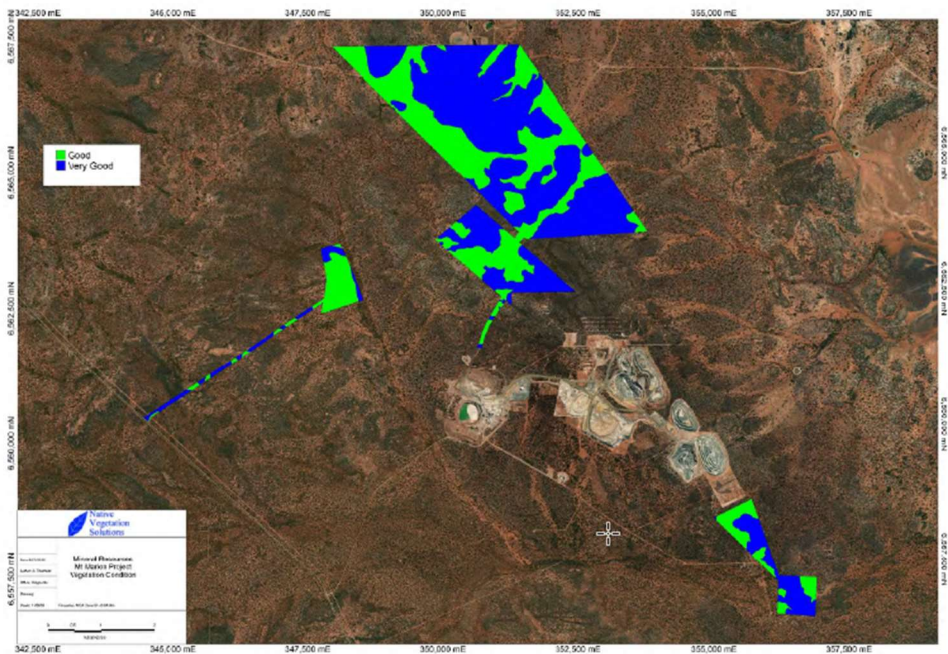


**Figure 6.** Representative photographs of vegetation groups / types over the survey area (NVS, 2021)





**Figure 7.** Map of vegetation types found in the survey area (NVS, 2021)



**Figure 8.** Map of vegetation conditions in the survey area (NVS, 2021)

**Fauna Surveys** (M.J. & A.R. Bamford Consulting Ecologists (BCE), 2022)

Bamford Consulting Ecologists (BCE) were commissioned by Mineral Resource Limited (MRL) to conduct a Basic (formerly level 1) and Targeted (*sensu* EPA 2020) Fauna Assessment (desktop assessment and targeted survey for conservation significant species) around MRL’s active Mt Marion Lithium Project located approximately 35 kilometres (km) south of Kalgoorlie, in the Coolgardie Bioregion and the Eastern Goldfields Subregion (COO03) of Western Australia. The Fauna Assessment focused specifically within Hamptons Lease Area 53 (application area), L15/353, M15/999, and East 15/1599.

The Assessment was focused on the following:

- Identification of Vegetation and Substrate Associations (VSAs) (that provide fauna habitats);
- Targeted searches for significant fauna and an assessment of their likelihood of occurrence based on VSAs present; target species include:
  - Malleefowl – opportunistic records of mounds;
  - Chuditch – camera trap survey;
  - Arid Bronze Azure Butterfly (ABAB) – opportunistic searching for associated *Camponotus* ants in smooth-barked eucalypts;
  - Trapdoor Spiders – opportunistic searching for trapdoor spider burrows in suitable habitat.
  - Continuous recording of bird species encountered; and
  - Opportunistic fauna observations.

Three broad levels of conservation significance are used in this report:

- Conservation Significance 1 (CS1) – species listed under State or Commonwealth Acts.
- Conservation Significance 2 (CS2) – species listed as Priority by DBCA but not listed under State or Commonwealth Acts.
- Conservation Significance 3 (CS3) – species not listed under Acts or in publications but considered of at least local significance because of their pattern of distribution.

## **Results**

### Vegetation and Substrate Associations (VSAs) that provide habitat for fauna

Seven major Vegetation and Substrate Associations (VSAs) were identified in the survey area:

- 1) Mixed Eucalypt woodland over sclerophyll shrubland on undulating hills (VSA 1);
- 2) Acacia shrubland on rocky rises (VSA 2);
- 3) Eucalypt woodland over mixed shrubs on red loam flats (VSA 3);
- 4) Mixed Eucalypt woodland over *Melaleuca sheathiana* on gravelly rises (VSA 4);
- 5) Dense Mallee and Eucalypt woodland associated with minor drainage lines (VSA 5);
- 6) Acacia shrubland on brown loam flats (VSA 6); and
- 7) Dense Acacia shrubland on exposed granite (VSA 7).

Only three of the VSAs occur within the application area.

All VSAs are considered important for fauna. Large Salmon Gums (*Eucalyptus salmonophloia*) provide important nesting opportunities for fauna and dense vegetation provide cover and habitat for species such as the Golden Whistler, Western Yellow Robin and malleefowl.

### Fauna assemblage

The desktop study identified 288 vertebrate fauna species as potentially occurring in the project area: five frogs, 85 reptiles, 164 birds, 25 native and ten introduced mammals. The presence of at least 95 species (one frog, 12 reptiles, 66 bird species, ten native mammals and six introduced mammals) has been recorded from surveys thus far. The 2021 field investigations confirmed the presence of three reptiles, 34 birds, two native mammals and one introduced mammal. The expected fauna assemblage is typical of the Coolgardie region and Goldfields eucalypt woodlands, with some species occurring at

There are 33 species of conservation significance expected to occur in the project area, comprising 10 CS1, two CS2 and 21 CS3 species. The majority of conservation significant species are expected as residents (13 species), following by vagrants (7 species), regular visitors (7 species) and irregular visitors (6 species). Ten conservation significant species have been recorded to date, comprising one CS1 and 9 CS3 species (one CS3 species was recorded in the 2021 field investigations).

Two malleefowl mounds were recorded in Hamptons, with one of these being recent but inactive. They were located within a densely-vegetated area in the southern part of Hamptons and this area is considered likely to provide suitable habitat for malleefowl. No chuditch were recorded on camera traps.

With the closest known population located 200 km southwest of the project, dispersing individuals may move through the area and the species is expected to occur in the project area as a vagrant or possibly an irregular visitor.

Several Trapdoor Spider burrows were detected (all within Hamptons) and were identified as species of the genus *Idiosoma*, with the potential for these to be the CS2 species.

No *Camponotus* ants which are associated with the ABAB were recorded and it is considered unlikely for the butterfly to occur in the project area.

#### Patterns of biodiversity

The presence of a range of VSAs are factors in patterns of biodiversity; fauna that occur in eucalypt woodlands throughout the region are likely to utilise the project area, areas of dense thicket are important for species that prefer dense cover, areas with exposed granite may support a unique suite of species, with large, hollow-bearing trees in woodlands providing potential important nesting opportunities.

#### Key ecological processes

Key ecological processes affecting the fauna assemblage in the project area are hydrology, feral species and possibly over-abundant native species.

#### Potential impacts upon fauna

Impacting processes included: habitat loss leading to population decline and population fragmentation, local hydrological change, degradation of habitat due to weed invasion, ongoing mortality from operations (i.e. roadkill of malleefowl and chuditch), impacts of feral and overabundant native species, fire and disturbance (dust, noise and light). Potential impacts are considered negligible to minor as the project area is small, relative to the broad and largely intact landscape. Recommendations related to conservation significant species include detailed targeted surveys for conservation significant species when a clearing footprint is available; protection of active malleefowl nests; roadkill management; feral species management; conserving mature trees; avoiding overabundant native species. Recommendations related to key fauna values include feral and overabundant native species management; minimise disturbance footprint; habitat preservation – retain important areas (such as large mature hollow-bearing trees); manage hydrology; and minimise disturbance to mature eucalypt trees and areas of dense understorey.

## **Appendix E. Sources of information**

### **E.1. GIS databases**

Publicly available GIS Databases used (sourced from [www.data.wa.gov.au](http://www.data.wa.gov.au)):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics



- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

#### Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

## E.2. References

Benshemesh, J. (2007). *National Recovery Plan for Malleefowl*. Department for Environment and Heritage, South Australia.

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) (2023) *Species and Communities Branch TEC/flora advice for clearing permit application CPS 9866/1*, received 11 July 2023. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: DWERDT804041).

Department of Environment Regulation (DER) (2013). *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: [https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2\\_assessment\\_native\\_veg.pdf](https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf).

Department of Mineral and Petroleum Resources (2002). *Guidelines for the protection of surface and groundwater resources during exploration drilling*. Perth; November 2002.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development*. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (accessed 30 June 2020).

- Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: <https://dwer.wa.gov.au/sites/default/files/Procedure Native vegetation clearing permits v1.PDF>
- Department of Water and Environmental Regulation (DWER) (2022). *Advice regarding water licencing under the RIWI Act*. Swan Avon Region. Received 15 November 2022. DWERD Ref. DWERDT686579.
- Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: [http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey\\_Dec13.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf).
- Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys*. Available from: [https://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf](https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf).
- Government of Western Australia (2019) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>
- Government of Western Australia. (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- M.J. & A.R. Bamford Consulting Ecologists (BCE) (2022). *Mt Marion Fauna Assessment: Hamptons Lease Area 53, L15/353, M15/999 and East E15/1599*. Prepared for Mineral Resources Limited. Kingsley, WA
- Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.
- Native Vegetation Solution (2021). *Detailed Flora and Vegetation Survey of the Mt. Marion Project Area – October 2021*. Prepared for Mineral Resources Limited. Kalgoorlie – May 2022.
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) *Atlas of Australian Soils*, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- Process Minerals International Ltd (2022) *Clearing permit application CPS 9866/1*, received 26 August 2022 (DWER Ref: DWERDT650665).
- Process Minerals International Ltd (2022). *Mount Marion Lithium Project. North Hamptons Area 53. Supporting documents for native vegetation clearing permit application CPS 9866/1*. 23 August 2022. received 26 August 2022 (DWER Ref: DWERDT650671).
- Process Minerals International Ltd (2022) *Clearing permit application CPS 9866/1*, Tenement reports for (Exploration Licence) E150/1599. 21 October 2022 (DWER Ref: DWERDT677208).

- Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs* Resource Management Technical Report No. 280. Department of Agriculture.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.
- Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed June 2023)