

Dear Sir/Madam

Northern Star (NSR) are proposing to clear up to 97.8 ha to enable the development of a NSR regional core yard (RC), including associated infrastructure with this type of mineral activities. The proposed clearing area is defined within tenement M26/61, with a total tenement area of 919.8 ha (Figure 1). The proposal area is located 3km north-west of Kalgoorlie, within land owned by the Northern Star (Saracen Kalgoorlie) Pty Ltd.

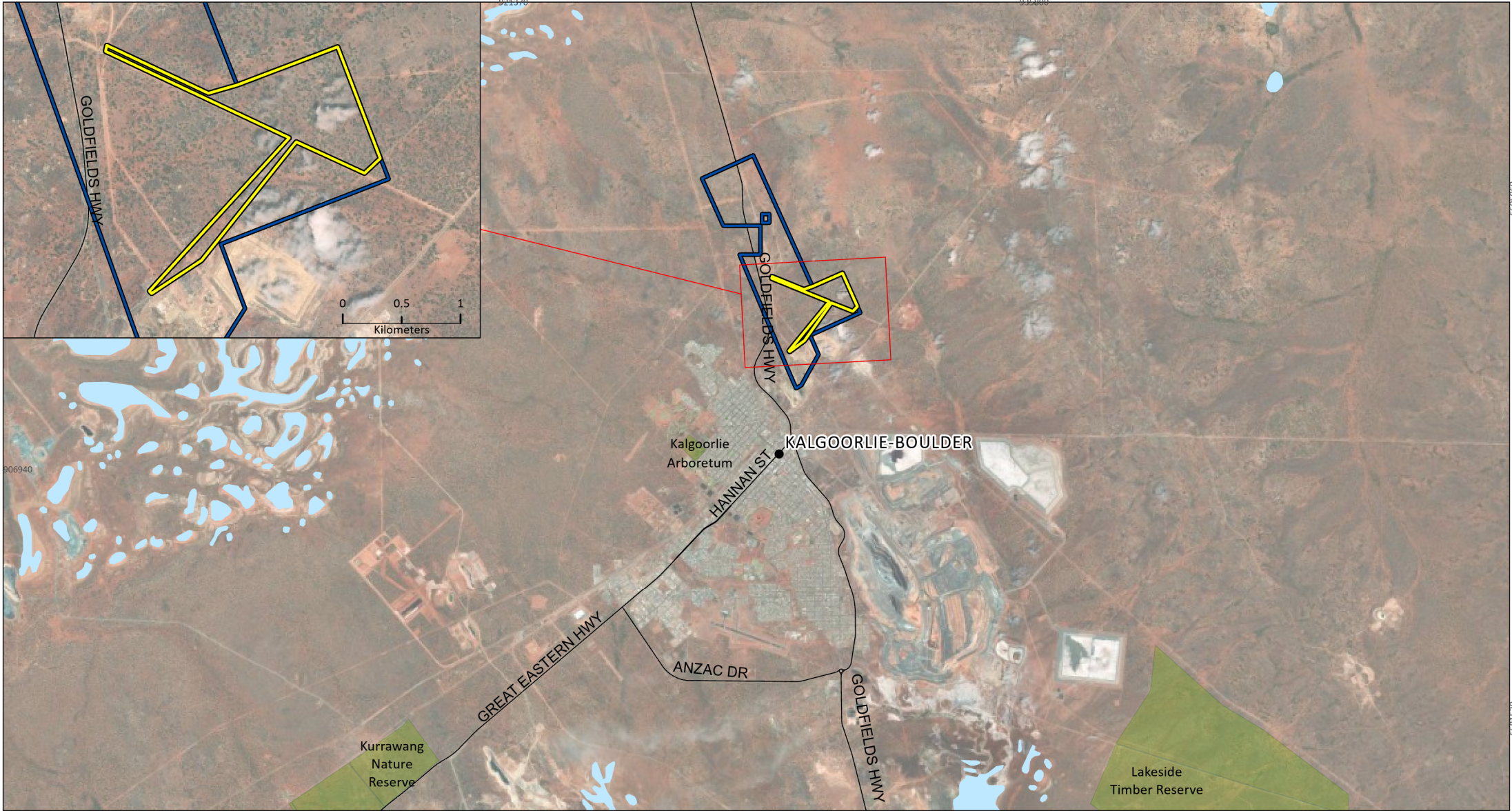
Phoenix Environmental Sciences (Phoenix) were engaged to conduct biodiversity surveys and assess potential impacts to fauna, flora and vegetation within the proposal area. The assessment against the ten clearing principles and summary table of potential significant impacts are presented in this report to support the application for the clearing permit (Area permit) and assessment under Part V of the EP Act if the Project is not subject to a Part IV assessment.


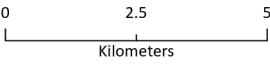
1.0 Introduction

Phoenix conducted fauna and flora surveys across the proposed clearing area in September 2022 and March 2023, respectively:

- Terrestrial fauna survey of the proposed Regional Core Yard for Kalgoorlie Operations. Prepared for NSR September 2022 (Phoenix 2022).
- Reconnaissance flora and vegetation survey for the Regional Core Yard Project. Prepared for NSR March 2023 (Phoenix 2023).

These survey results are summarised in the assessment against the ten principles (Section 2, Table 1), and the determination of potential impacts to populations of significant fauna, fauna habitat, flora, and vegetation (Section 3, Table 2, 3 and 4).



Northern Star Resources Limited Northern Star Regional Coreyard		
Project No	1560	
Date	3/05/2023	
Drawn by	BK	
Map author	GM	
1:144,500 (at A4)		GDA 1994 MGA Zone 51







-  Study area
-  Tenement area
-  DBCA managed land
-  Lakes
-  Environmentally sensitive areas
-  Roads

Figure 1
Tenement location and proposal area

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2.0 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

Table 1 Preliminary assessment against the native vegetation clearing principles.

Principle	Preliminary assessment
<p>Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity</p>	<p>The proposed clearing area is not likely to be at variance, given the following:</p> <p>The proposed clearing area does not represent or occur in the vicinity of an area known for its high-level biodiversity (Government of Western Australia 2014).</p> <p>The reconnaissance flora and vegetation survey conducted in, recorded 53 native flora taxa in the study area. No threatened flora was observed or recorded in the study area. One Priority two, <i>Eremophila praecox</i> (P2), was recorded within the study and surrounding, area (Phoenix 2023).</p> <p>Flora recorded were grouped according to similarity of vegetation community structure. Analysis was conducted based on species presence. 4 vegetation types were identified across the proposal area. <i>Eucalyptus</i> woodlands comprised 79.9% of the proposed clearing area. The vegetation types were not restricted and were observed to extend beyond the proposal area.</p> <p>There were a number of <i>Eremophila praecox</i> (P2) (11) recorded in the woodland vegetation, potentially increasing the significance of the woodland vegetation. However, there are numerous records (494 in total) of <i>Eremophila praecox</i> within the vicinity (QGIS), and 98% of this pre- European vegetation remains with a total extent of >500, 000 ha. Therefore, the clearing of 97.8 ha is not likely to represent an area of vegetation that supports a significant population of priority flora (Phoenix 2023).</p> <p>The flora, vegetation, and fauna present in the application are relatively well represented in the surrounding area (Phoenix 2023).</p> <p>The application area is unlikely to represent a high level of biodiversity than that represented in the surrounding area.</p>
<p>Principle (b) – 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 indigenous to Western Australia.</p>	<p>The proposed clearing is not likely to be at variance to this Principle.</p> <p>A desk top review identified 255 vertebrate taxa records, including 20 significant vertebrate species.</p>

	<p>Records of 69 Short Range Endemics (SRE) were identified. Including 6 confirmed, 37 potential SRE species, 9 widespread and 17 uncertain.</p> <p>The desktop also identified records of 2 conservation significant invertebrate species: Arid Bronze Azure Butterfly (<i>Ogyris subterrestris petrina</i>) (EPBC Act, BC Act – CR), and Inland Hairstreak butterfly (<i>Jalmenus aridus</i>) (P1) (Phoenix 2022).</p> <p>The fauna survey of the proposed clearing area recorded 23 vertebrates. Comprised of 21 bird species and 2 introduced mammal species, all common and widespread. No SRE, significant invertebrates were recorded (Phoenix 2022).</p> <p>A targeted search of the area did not record any, <i>Camponotus</i> sp. nr. <i>terebrans</i>, host of the Critically Endangered Arid Bronze Azure Butterfly (ABAB, <i>Ogyris subterrestris petrina</i>), within the proposed clearing area (Phoenix 2022).</p> <p>There is suitable habitat for <i>Jalmenus aridus</i> in the proposal area, and the area is within the known species range. However, little of the biology of this species is known due to limited knowledge. Though recent collections indicate this species may be associated with widespread species and a variety of habitats and therefore may be more widespread than previously thought (Phoenix 2022).</p> <p>The field study observed one habitat, Open woodland, across the proposed clearing area. Evidence of vehicle tracks, and litter disturbance were also found across the study area (Phoenix 2022).</p> <p>The survey assessed the habitat type and condition to be widespread. Likely to support fauna of abundant and widespread distribution with broad range of habitat tolerances. As such, the impacts of the Proposal will have a negligible effect on fauna and fauna habitat within the study area (Phoenix 2022).</p>
<p>Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</p>	<p>The proposed clearing is not likely to be at variance to this Principle.</p> <p>There are no records of Threatened flora within the proposal area (QGIS). The Reconnaissance flora and vegetation survey of the proposed clearing area did not record any observations of Threatened flora (Phoenix 2023).</p>

<p>Principle (d) – 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</p>	<p>The proposed clearing is not likely to be at variance to this Principle.</p> <p>As there are no known Threatened Ecological Communities (TEC's) located within or in close proximity to the application area (Phoenix 2023); QGIS).</p>
<p>Principle (e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</p>	<p>The proposed clearing is not likely to be at variance to this principle.</p> <p>The proposal area falls within the Eastern Goldfields subregion (COO3) of the Coolgardie Bioregion (Phoenix 2023).</p> <p>The pre- European vegetation associations are broadly mapped as the following Beard vegetation associations:</p> <ul style="list-style-type: none"> • 468, Medium woodland; salmon gum & goldfields blackbutt. • 1294, Medium woodland; coral gum. <p>Within the Coolgardie Bioregion there is more than 96% of each of these vegetation associations remaining, a status of 'Least Concern' (Phoenix 2023).</p>
<p>Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</p>	<p>The proposal is not at variance to this Principle:</p> <p>There are no permanent watercourses or wetlands mapped in the proposal area or immediate vicinity (QGIS).</p> <p>None of the vegetation associations mapped within the proposal area are described as or known to be growing in association with a watercourse or wet land.</p>
<p>Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</p>	<p>The proposal is not likely to be at variance to this Principle.</p> <p>Topography mapping indicates the degree of slope to impel movement of soils and water to cause or exacerbate erosion (QGIS).</p> <p>The majority of the proposal area is described as: Gently undulating valley plains and pediments; some outcrop of basic rock (Phoenix 2023).</p> <p>Given the above and the relatively area of clearing, it is not likely that the clearing will cause appreciable land degradation.</p>
<p>Principle (h) – 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</p>	<p>The proposal is not likely to be at variance to this Principle.</p>

<p>nearby conservation area. Proposed clearing unlikely to be at variance.</p>	<p>There are no conservation areas adjacent to or in the or in close proximity of the proposal area.</p> <p>Goongarrie National Park (R 35637) is 67 km to the north of the study area, and Clear and Muddy Lakes Nature Reserve (R 7634) is located 71 km to the west north-west (Phoenix 2023).</p>
<p>Principle (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.</p>	<p>The proposal is not likely to be at variance to this Principle.</p> <p>There are no Public Drinking Water Sources in the proposal area, or close to the proposal (DoW 2023).</p> <p>The clearing of vegetation is not likely to impact ground water or surface water quality and flows within the proposal area.</p>
<p>Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.</p>	<p>The proposal is not likely to be at variance to this Principle.</p> <p>The climate is arid to semi-arid with 200-300mm of rainfall, sometimes in summer but usually in winter (Phoenix 2023).</p> <p>There are no mapped watercourses or major hydrology lines in the proposal area (QGIS). Intermittent streamflow typically occurs after major rainfall events (DoW 2023).</p> <p>Therefore, the proposed clearing of native vegetation is unlikely to increase the intensity and or incidence of seasonal flooding events.</p>

3.0 DETERMINATION OF POTENTIAL IMPACTS TO FLORA, VEGETATION AND FAUNA

Potential impacts to flora, vegetation, and fauna in the proposed clearing area of 97.8 ha of land containing:

- 97.8 ha of native vegetation.
- up to 53 native flora species.
- one significant priority species; *Eremophila praecox* (P2)
- a total of 4 vegetation communities, ranging in condition from Very Good to Completely Degraded.
- none of the vegetation types were considered to be regionally significant due to restricted distribution, species diversity, restricted occurrence within the survey area or as habitat for significant flora.
- no Priority fauna species.
- one broad fauna habitat; Open woodland
- no significant habitats.

3.1 FIELD SURVEY RESULTS

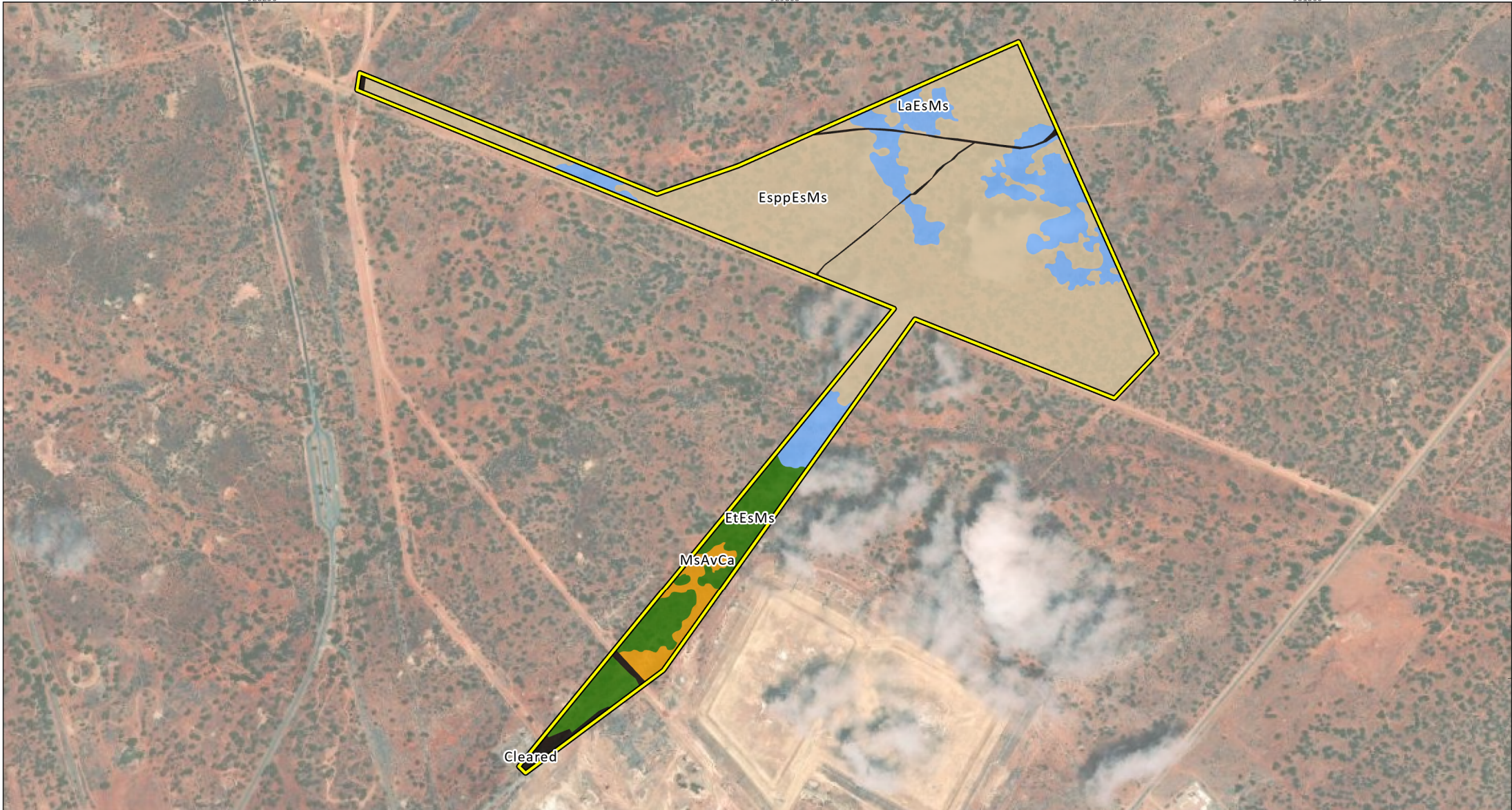
3.1.1 VEGETATION TYPES

A total of 4 vegetation types were mapped by Phoenix (2023) across the study area. None of the vegetation types are considered regionally significant (Table 2; Figure 2).

Vegetation types EtEsMs and EspEsMs may be considered locally significant providing a role as a refuge for the significant flora *Eremophila praecox* (P2) (Phoenix 2023).

Table 2 Proportional impacts of vegetation types recorded for the proposal area.

Vegetation type	Survey area (ha)	Permit area (ha)
EtEsMs	9.3	9.3
EspEsMs	68.9	68.9
Total	78.2	78.2



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Northern Star Resources Ltd
Northern Star Regional Coreyard

Project No	1539
Date	3/05/2023
Drawn by	BK
Map author	GM

0 400 800
Meters

1:15,500 (at A4) GDA 1994 MGA Zone 51

Study area

Vegetation type

- Cleared
- EsppEsMs
- EtEsMs
- LaEsMs
- MsAvCa

Figure 2
Vegetation mapping within the proposal area



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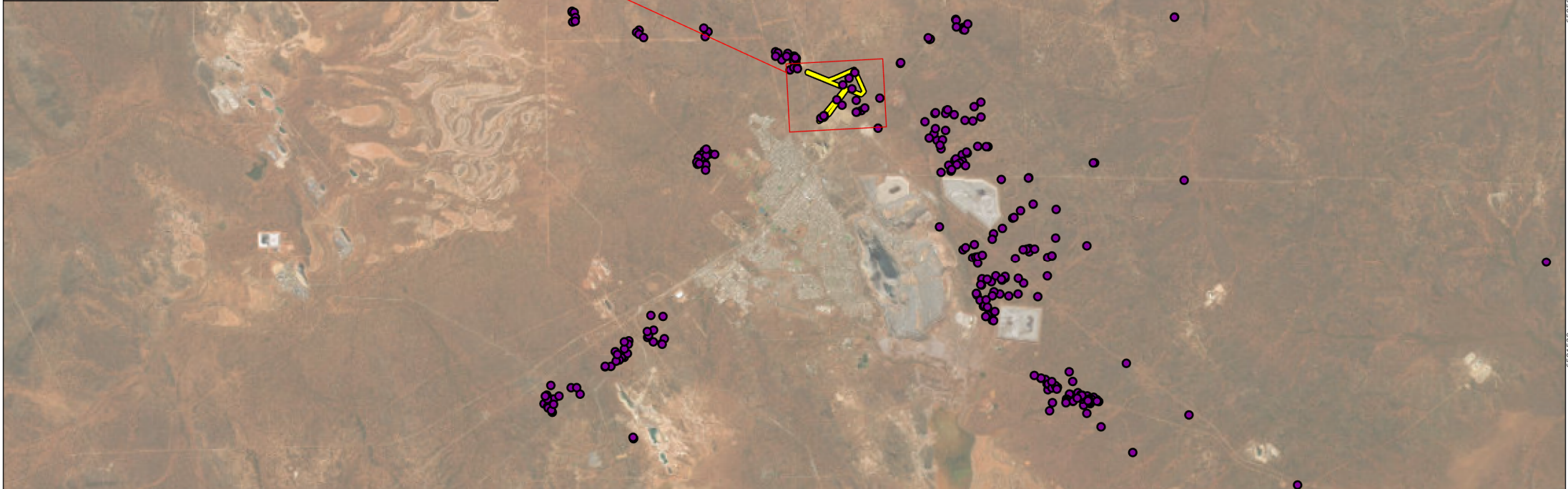
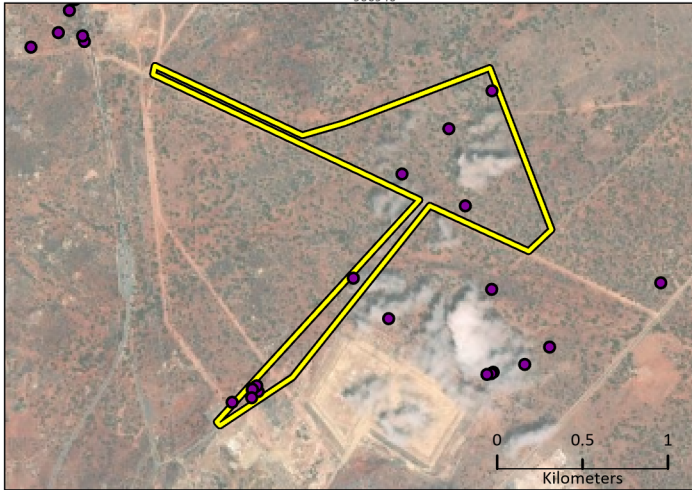
3.1.2 SIGNIFICANT FLORA

Phoenix (2023) recorded one significant flora species within the proposed clearing area, Flora base records provide regional context for significant species found during the survey; however, exact population numbers are not always recorded (WA Herbarium 1998). While exact regional population and plant numbers may not be available, it is worth noting that the number of individual plants within the proposed clearing area is minimal, and that the species is well represented outside of the proposal area (Table 3; Figure 3).

Table 3 Regional context for significant flora records

Species	Habitat	Phoenix survey records			Florabase records	No. of plants to be disturbed
		No. plants Study Area	Veg. types	Survey Records	No. records	
<i>Eremophila praecox</i> (P2)	Mid open <i>Eucalyptus transcidentalis</i> woodland over mid open <i>Eremophila scoparia</i> , <i>Maireana sedifolia</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> shrubland; Low to Mid Eucalyptus woodland with combinations of the presence of <i>E. onophloia</i> , <i>E. salubris</i> and <i>E. esouefii</i> , over sparse to open <i>Eremophila scoparia</i> , <i>Maireana sedifolia</i> and <i>Senna artemisioides</i> subsp. <i>Filifolia</i> shrubland.	11	EtEsMs; EspEsMs	494 ¹	37	11

¹Detailed flora and vegetation survey for the Crossroads Project (Phoenix 2023).



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Project No	1560	
Date	3/05/2023	
Map author	GM	
1:225,800 (at A4)		GDA 1994 MGA Zone 51

- Study area
- Eremophila praecox* records

Figure 3
Records of *Eremophila praecox* (P2) in and outside proposal area



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3.1.3 PRIORITY ECOLOGICAL COMMUNITIES AND ENVIRONMENTALLY SENSITIVE AREAS

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the proposed clearing area (Phoenix 2023). The closest PEC is the Emu Land System (P3) located approximately 55km north of the proposed clearing area (QGIS).

Flora and vegetation surveys identified no TECs within the survey area (Phoenix 2023).

3.1.4 SIGNIFICANT FAUNA

No Priority fauna species were recorded in the proposed clearing area(Phoenix 2022).

The fauna habitat present across the study area is widespread outside of the proposal area, and the area does not contain any landforms which may act as refugia or barriers to dispersal. Given the widespread distribution of the habitat; the impacts of the Proposal are likely to have a negligible effect on fauna and fauna habitat within the study area (Phoenix 2022).

Table 4 Fauna habitat for proposal area

Habitat	Permit area (ha)
Open woodland	98.7

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