



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 9466/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Pantoro South Pty Ltd

1.3. Property details

Property: Mining Leases 63/11, 63/13, 63/14, 63/15, 63/36, 63/42, 63/43, 63/68, 63/133, 63/140, 63/142, 63/155, 63/156, 63/275, 63/659
Miscellaneous Licence 63/32

Local Government Area: Shire of Dundas

Colloquial name: Norseman Gold Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
365.7		Mechanical Removal	Mineral production and associated activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 10 February 2022

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description The vegetation of the application area is broadly mapped as the following Beard vegetation associations:

9: Medium woodland; coral gum (*Eucalyptus torquata*) & goldfields blackbutt (*E. le soufii*);
110: Hummock grasslands, shrub steppe; red mallee over spinifex, *Triodia scariosa*;
125: Bare areas; salt lakes;
221: Succulent steppe; saltbush;
524: Medium woodland; Dundas blackbutt & red mallee; and
3106: Medium woodland; salmon gum & Dundas blackbutt (GIS Database).

Flora and vegetation surveys have been undertaken within the application area by Mattiske (2020a) from 29 March to 3 April 2020, Mattiske (2020b) from 21 to 25 September, and 5 to 9 October 2020, and Biota (2020) from 11 to 14 August 2020. The following vegetation associations were recorded within the application area:

SL - Salt lake or non-vegetated lake bed.

NS1 - Open Shrubland: Open shrubland of *Callitris preissii*, *Geijera linearifolia* over *Senna artemisioides* ?subsp. *filifolia*, *Pittosporum angustifolium*, *Santalum acuminatum* and *Eremophila scoparia* over *Westringia rigida*, *Scaevola spinescens* and *Rhagodia ?drummondii* mixed low chenopod shrubs.

NS2 - Low Shrubland: Low shrubland of *Eremophila ?decipiens*, *Tecticornia* sp. 3 and *Atriplex ?vesicaria* on red-brown clay on valley floors.

NS3 - Low Open Shrubland: Low open chenopod shrubland of *Maireana amoena*, *Atriplex* spp. and *Tecticornia* spp. on cream to red sandy clay on flats on the edge of salt lakes and salty drainages.

NS4 - Mid-Shrubland: Sparse mid shrubland of *Dodonaea viscosa* subsp. *angustissima* over open low shrubland of *Eremophila ?decipiens*, *Scaevola spinescens*, *Atriplex ?vesicaria*, *Rhagodia ?drummondii*, mixed *Chenopodiaceae* spp. and *Frankenia* sp. on red-brown sandy clay on low rises at the edge of salt lakes and salty drainages.

NW1 - Closed Low Mallet Forest: Closed low mallet forest of *Eucalyptus prolixa* on red-brown clayey loam flats in deep litter on redbrown clayey loam on flats.

NW2 - Open Mallee Woodland: Open mallee woodland of *Eucalyptus planipes* and occasional *Eucalyptus longissima* over sparse mid-low shrubland of *Allocasuarina helmsii*, *Eremophila* spp. and *Westringia rigida* over open-sparse low hummock grassland of *Triodia scariosa* on occasionally rocky redbrown sandy clayey loam on flats to mid-slopes.

NW2a - Isolated Clumps: Isolated clumps of *Eucalyptus ?oleosa* subsp. *oleosa* low mallees over tall *Acacia* sp. shrubland over isolated clumps of *Grevillea anethifolia* mid shrubs over isolated clumps of *Triodia scariosa* mid hummock grass on red-brown sandy clayey loam in a creek line.

NW2b - Isolated Clumps: Isolated clumps of *Eucalyptus planipes* mallees over mid sparse shrubland of *Acacia* sp., *Senna artemisioides* ?subsp. *filifolia* and *Eremophila ?deserti* over low open shrubland of *Dodonaea ?microzyga* on red-brown sandy loam on mid slopes with evidence of sheet flow.

NW3 - Open Low Woodland: Open low woodland of *Eucalyptus lesouefii* over open shrubland of *Melaleuca quadrifaria* over *Dodonaea stenozyga* and *Cratystylis conocephala* on brown clay on low rises.

NW4 - Open Low Woodland: Open low woodland of *Eucalyptus lesouefii* over tall isolated clumps of *Melaleuca ?sheathiana* and *Eremophila* spp. shrubs over low isolated clumps of *Cratystylis conocephala* shrubs on brown sandy clayey loam with some surface rocks on flats and gentle slopes.

NW5 - Mid-Woodland: Mid woodland of *Eucalyptus lesouefii* and *Eucalyptus salubris* over mid isolated shrubs of *Eremophila scoparia* and occasional low *E. parvifolia* ?subsp. *auricampi* shrubs over open low chenopod shrubland of *Tecticornia* spp. and *Atriplex* spp. on orange to brown sandy clay with some surface gravel on flats and gentle slopes.

NW6 - Mid-Woodland: Mid woodland of *Eucalyptus salubris* over isolated tall *Santalum acuminatum* shrubs over isolated mid *Eremophila* spp. shrubs over low sparse shrubland of *Atriplex ?vesicaria*, *Cratystylis conocephala* and *Olearia muelleri* on red-brown clayey loam with occasional surface rocks on ridges and upland flats.

NW7 - Low Woodland: Low woodland of *Eucalyptus salubris* and *E. lesouefii* over tall sparse shrubland of *Melaleuca ?sheathiana* or *M. lanceolata* over mid-low sparse shrubland of *Atriplex ?nummularia* and *Atriplex ?vesicaria* on red to brown sandy clay with scattered surface rocks on flats and lower slopes.

NW8 - Low Open Woodland: Open low woodland of *Eucalyptus torquata* over mid sparse shrubland of *Beyeria sulcata* var. *brevipes* and *Eremophila* spp. Over low isolated clumps of shrubs of *Scaevola spinescens*, *Atriplex ?vesicaria* and *Olearia muelleri* on red to brown clayey loam on lower to mid slopes.

NW9 - Low Woodland: Low woodland of *Eucalyptus spreata* over isolated clumps of mid *Cratystylis conocephala* shrubs, isolated low mixed chenopod and *Lawrenzia squamata* shrubs and isolated tussock grassland of Poaceae sp. 3 on dry, powdery pale orange clayey loam on low dune ridges near salt lakes.

NW10 - Mid-Woodland: Mid woodland of mixed *Eucalyptus* spp. over tall sparse shrubland of *Melaleuca ?sheathiana* over open mid-low shrubland of *Atriplex* spp. on brown clayey loam with some surface rocks on gentle mid to upper slopes.

NW11 - Low Open Woodland: Open low woodland of *Casuarina obesa* over low isolated clumps of *Chenopodiaceae* sp. and *Aizoaceae* sp. shrubs and isolated tussock grassland on dry, powdery pale orange clay on low dune ridges and flats at the edge of salt lakes.

NW12 - Isolated Clumps: Isolated clumps of *Pittosporum angustifolium* low trees over isolated clumps of mid *Eremophila ?deserti* shrubs over sparse low shrubland of *Atriplex ?vesicaria*, *Tecticornia* sp. 3 and *Frankenia interioris* var. *interioris* on dry, powdery brown clayey loam on low dune ridges near salt lakes.

NW13 - Low Open Forest: Low open forest of mixed *Eucalyptus* spp. over mid sparse shrubland of *Eremophila scoparia* and other mixed mid shrubs on pale brown clay on gentle lower slopes and flats in areas disturbed in the past.

NW14 - Low-Mid Woodland: Low-mid woodland of *Eucalyptus urna* over mid-tall shrubland of *Eremophila ?ionantha*, *Ricinocarpos stylosus* and *Santalum acuminatum* over mixed low shrubs on red clayey soils with some surface gravel in drainage lines.

NW15 - Mid-Woodland: Mid woodland of *Eucalyptus lesouefii* and *E. dundasii* over open mid shrubland of *Trymalium myrtillus* subsp. *myrtillus* and *Halgania ?andromedifolia* on red-brown claygravel on mid slopes with some outcropping granite in areas disturbed in the past.

S1 - Shrubland: Shrubland of *Allocasuarina* spp., *Acacia neurophylla* subsp. *neurophylla*, *Melaleuca ?hamata*, *Dodonaea microzyga* var. *acrolobata* and *Cryptandra* spp. over mixed *Asteraceae* sp. and *Lepidosperma* sp. on red-brown clayey loam and ironstone outcropping on upper slopes and ridges.

S2 - Sparse Shrubland: Sparse shrubland of *Scaevola spinescens*, *Exocarpos aphyllus* and *Grevillea acuaria* over *Atriplex* spp. and *Maireana* spp. on orange clay flats on salt lake margins.

S3 - Open Woodland: Open woodland of *Eucalyptus ?salicola* over open shrubland of *Bossiaea barbara*, *Acacia assimilis* subsp. *assimilis* and *Melaleuca lanceolata* over *Lepidosperma* sp. on pale orange sand flats on salt lake margins.

S4 - Open Shrubland: Open shrubland of *Grevillea nematophylla* subsp. *nematophylla* with emergent *Eucalyptus stricklandii* over *Hibbertia pungens*, *Allocasuarina acutivalvis* subsp. *acutivalvis* and *Dampiera lateolata* on orange clay loam with outcropping ironstone on ridges.

S5 - Mid Shrubland: Mid shrubland of *Eremophila purpurascens* (P3), *Senna artemisioides* subsp. *filifolia*, *Pomaderris forrestiana*, *Scaevola spinescens* and *Dodonaea microzyga* var. *acrolobata* over low sparse shrubland of *Cratystylis conocephala* and *Hibbertia pungens* on red-brown sandy clay with scattered surface gravel on lower slopes near salt lakes.

S6 - Tall Open Shrubland: Tall open shrubland of *Eremophila alternifolia* over *Dodonaea lobulata* and *Eremophila glabra* over *Atriplex vesicaria* over *Austrostipa scabra* with emergent *Eucalyptus torquata* on slopes in clay loam in association with ultramafic outcropping with quartz pebbles.

W1 - Woodland: Woodland of *Eucalyptus dundasii* and *Eucalyptus salubris* and occasional *Eucalyptus clelandiorum* over *Scaevola spinescens*, *Beyeria sulcata*, *Exocarpos aphyllus* and *Santalum acuminatum* on orange to pale brown clayey loam on flats and gently sloping terrain.

W2 - Woodland / Open Woodland: Woodland to open woodland of *Eucalyptus flocktoniae*, *E. urna*, *E. lesouefii* and *E. dundasii* over sparse shrubland of *Melaleuca sheathiana*, *Eremophila scoparia*, *Scaevola spinescens*, *Beyeria sulcata* and *Exocarpos aphyllus* over isolated shrubs of *Olearia muelleri* on orange-red to brown clayey loam on flats and slopes.

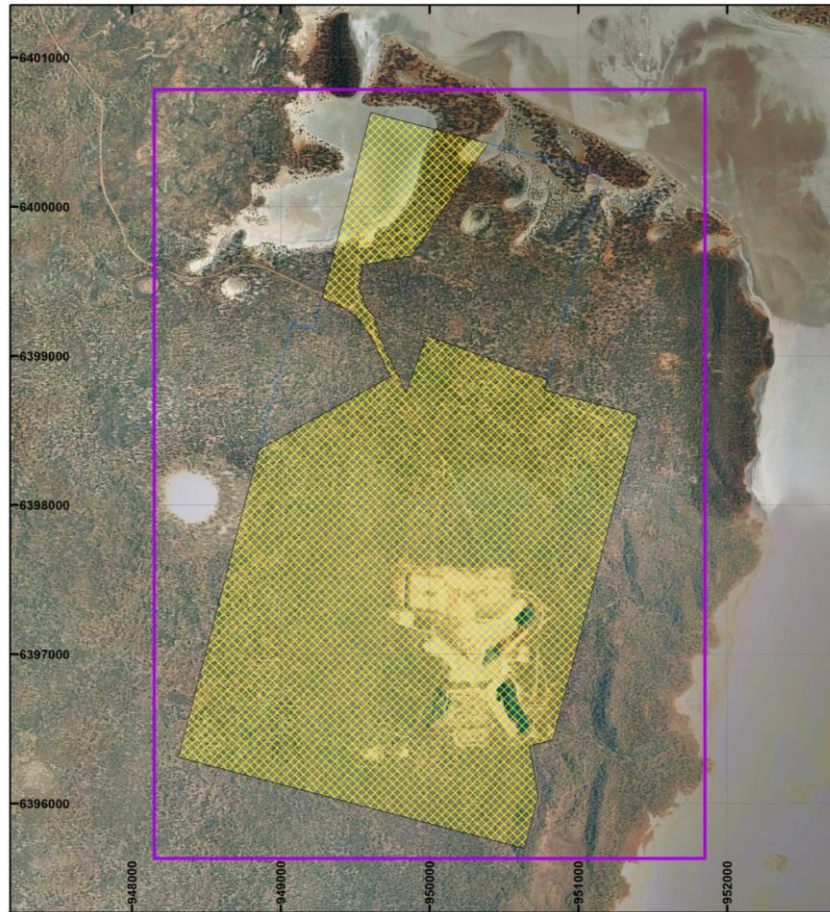
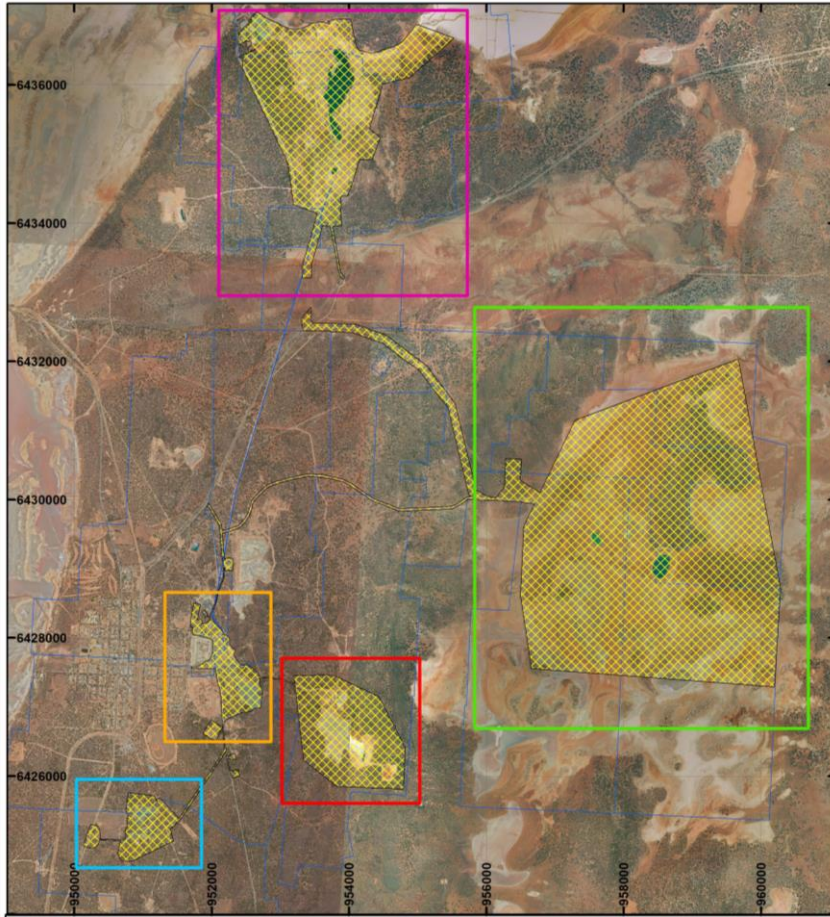
W3 - Open Woodland: Open woodland of *Eucalyptus longicornis* or *E. delicata* over open shrubland of *Melaleuca sheathiana* and *Cratystylis conocephala* over mixed sparse chenopod shrubland on pale brown clayey loam flats.

W4 - Open Woodland: Open woodland of *Eucalyptus torquata* over *Melaleuca sheathiana*, *Dodonaea microzyga*, *Alyxia buxifolia*, *Beyeria spp.* and *Eremophila spp.* over *Scaevola spinescens* and *Ptilotus obovatus* on red-brown clayey loam with surface rocks on slopes and ridges.

W5 - Open Woodland: Open woodland of *Eucalyptus gracilis*, *E. flocktoniae* and *E. urna* over sparse shrubland of *Olearia spp.* on red-orange clayey loam and sandy clay flats.

W6 - Low Open Woodland: Low open woodland of *Eucalyptus concinna* over isolated clumps of *Melaleuca spp.* and *Santalum acuminatum* mid-tall shrubs over isolated clumps of *Scaevola spinescens* low shrubs on sandy clay with some outcropping on low ridges near salt lakes.

Clearing Description	Norseman Gold Project. Pantoro South Pty Ltd proposes to clear up to 365.7 hectares of native vegetation within a boundary of approximately 2,281 hectares, for the purpose of mineral production and associated activities. The project is located approximately 300 metres east of Norseman, within the Shire of Dundas.
Vegetation Condition	Pristine: No obvious signs of disturbance (Keighery, 1994); To: Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The vegetation condition was derived from vegetation surveys undertaken by Mattiske (2020a; 2020b) and Biota (2020). The proposed clearing is for the development of four project areas within the Norseman Gold Project footprint (Pantoro, 2021). These areas include: <ul style="list-style-type: none">- Processing plant, TSF4, accommodation village & supporting infrastructure (within M 63/11, M 63/13, M 63/14, M 63/15, M 63/133);- OK underground mine, waste rock dump, dewatering and supporting infrastructure (within M 63/15, M 63/68);- Scotia mine, waste rock dumps, dewatering and supporting infrastructure (within M 63/36); and- Gladstone-Everlasting and Slippers mines, including waste rock dumps, dewatering and supporting infrastructure (within M 63/11, M 63/14, M 63/42, M 63/43, M 63/133, M 63/140, M 63/142, M 63/155, M 63/156, M 63/275, M 63/659, and L 63/32).



LEGEND

 Mining Tenements	 Site Layout	 Processing Plant
 Clearing Instruments	 OK	 Scotia
 Area Approved to Clear	 TSF4	 Gladstone and Everlasting

Orthophotography sourced from Landgate

3. Assessment of application against Clearing Principles

(a) Native vegetation should not be cleared if it comprises a high level of biodiversity.

Comments

Proposal is not likely to be at variance to this Principle

Several flora and vegetation surveys have been undertaken within the application area (Mattiske, 2020a; 2020b; Biota, 2020). The surveys found that the vegetation types recorded within the application area are common within the local and regional area (Mattiske, 2020a; 2020b; Biota, 2020). No Threatened or Priority Ecological Communities were recorded within the application area (GIS Database).

Mattiske (2020a) identified one Threatened Flora species, a dead *Daviesia microcarpa*, at two locations within the application area. No live specimens were recorded (Mattiske, 2020a). An area extending 50 metres from the known location of the dead specimens has been excised from the application area by the proponent (Pantoro, 2021). There were four Priority flora species recorded within the application area by Mattiske (2020a; 2020b);

- *Calandrinia lefroyensis* (Priority 1);
- *Acacia kerryana* (Priority 2);
- *Eremophila purpurascens* (Priority 3);
- *Eucalyptus brockwayi* (Priority 3);

The species *Calandrinia lefroyensis*, *Eremophila purpurascens* and *Acacia kerryana* were recorded outside the proposed disturbance footprint, and Pantoro (2021) advised that these species will not be impacted by the proposed clearing. The Mattiske (2020b) survey recorded five locations of *Eucalyptus brockwayi*, with three of these locations to the north, northwest and southwest of TSF4 (Pantoro, 2021). Pantoro (2021) advised that these records are not located within the proposed TSF4 disturbance layout and will therefore be avoided. This species was also recorded north of the proposed camp, which will not be disturbed by the proposed camp layout and within the wastewater treatment plant irrigation field which will not be cleared (Pantoro, 2021). Potential impacts to Priority flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

Several weed species were recorded within the application area (Mattiske, 2020a; 2020b; Biota, 2020). Clearing activities have the potential to result in an increase in the incidence of weed species, which may negatively impact on the biodiversity of the local area. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.

The vegetation associations, fauna habitats and landform types present within the application area are well represented in surrounding areas (Mattiske, 2020a; Western Wildlife, 2021; GIS Database). The application area is unlikely to represent an area of higher biodiversity than surrounding areas, in either a local or regional context.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

Biota (2020)
Mattiske (2020a)
Mattiske (2020b)
Pantoro (2021)
Western Wildlife (2021)

GIS Database:

- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Flora
- Threatened Fauna

(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.

Comments

Proposal is not likely to be at variance to this Principle

Western Wildlife undertook a basic vertebrate fauna study and targeted Malleefowl survey over the majority of the application area and surrounding areas from 2 to 6 June 2020 (Western Wildlife, 2021).

There were eight fauna habitat types identified within the application area:

1. Eucalypt woodland on rocky hills;
2. Eucalypt woodland on plains;
3. Mallee woodland over spinifex;
4. Shrubland on rocky hills;

5. Shrubland on sandy lake edges;
6. Gypsum dunes;
7. Chenopod shrubland; and
8. Salt lake (Western Wildlife, 2021).

These faunal habitats are common in the region and are unlikely to be of particular significance as ecological linkages, refugia or supporting important populations of conservation significant vertebrate fauna (Western Wildlife, 2021).

There are nine conservation significant species that may occur within the application area based on the mapped vegetation types:

- Curlew Sandpiper (*Calidris ferruginea*) – EPBC Act - Critically Endangered and Migratory, BC Act - Critically Endangered;
- Chuditch (*Dasyurus geoffroii*) – EPBC Act - Vulnerable, BC Act – Vulnerable;
- Malleefowl (*Leipoa ocellata*) – EPBC Act - Vulnerable, BC Act – Vulnerable;
- Peregrine Falcon (*Falco peregrinus*) – BC Act - Other Specially Protected;
- Central Long-eared Bat (*Nyctophilus major tor*) – Priority 3;
- Lake Cronin Snake (*Paroplocephalus atriceps*) – Priority 3;
- Hooded Plover (*Thinornis cucullata*) – Priority 4;
- Western Brush Wallaby (*Notamacropus irma*) – Priority 4; and
- Inland Western Rosella (*Platycercus icterotis xanthagenys*) – Priority 4.

There was one conservation significant species recorded within the application area; the Inland Western Rosella. This species was recorded within the 'Eucalypt woodland on rocky hills' fauna habitat within the OK project area (Western Wildlife, 2021). This subspecies is only found in the wheatbelt and is likely to occur in eucalypt woodlands and shrublands, breeding in tree hollows, and is known to be a breeding resident in the local area (Western Wildlife 2021). The proposed clearing is likely to impact 6.1 per cent of the mapped 'Eucalypt woodland on rocky hills' fauna habitat type within the application area (Pantoro, 2021). Aerial imagery shows that this faunal habitat type in the local OK project area is largely encompassed by cleared areas and existing disturbance (GIS Database). Given the highly mobile nature of this species and the large tracts of uncleared vegetation outside the application area which contains eucalypt woodlands and shrublands (GIS Database), the proposed clearing is not likely to represent significant habitat for this species.

The Curlew Sandpiper occurs around the coasts of Australia and is also quite widespread inland, though in smaller numbers. Inland, they inhabit around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand (DaWE, 2022). The Hooded Plover is known to occur in close proximity to the application area, on the salt lake 'Lake Dundas' (Western Wildlife, 2021). The application area intersects small areas of salt lakes which are very common in the local area (GIS Database). Sections of the application area may be utilised by this species as a part of a larger range than be reliant specifically on the habitat within the application area.

The Chuditch may occur in woodlands and shrublands in low densities, but there are very few records of this species in the region (Western Wildlife, 2021). The Peregrine Falcon is likely to occur as a foraging visitor within the application area, however the proposed clearing is not likely to represent significant habitat for this species.

Malleefowl is known to occur in the region and may utilise the application area for foraging, but it is not likely to represent significant habitat for this species. No evidence of the Malleefowl was recorded during the fauna survey, and dense shrubby habitats suitable for nesting were uncommon in the local area (Western Wildlife, 2021; GIS Database).

The Lake Cronin Snake has a low likelihood of occurrence despite suitable habitat being present within the application area, as there are few records in the region and the study area is north of its current known range (Western Wildlife, 2021).

The Central Long-eared Bat is known to occur in the region and is likely to occur in eucalypt Woodlands, and the Western Brush Wallaby may occur in woodland and shrubland habitats, however, the application area represents the extreme eastern edge of this species range (Western Wildlife, 2021). These species may utilise the application area for foraging, but it is not likely to represent significant habitat for this species.

Several migratory avian species may potentially occasionally occur within the salt lake habitat within the local area, however the application area is unlikely to support nationally or internationally significant numbers of any species (Western Wildlife, 2021).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology DaWE (2022)
Pantoro (2021)
Western Wildlife (2021)

GIS Database:
- Imagery
- Pre-European Vegetation
- Threatened Fauna

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

Comments Proposal is not likely to be at variance to this Principle

There are no known records of Threatened flora within the application area (GIS Database). The species *Daviesia microcarpa* was previously recorded within close proximity of the application area, with the most recent record from 2001 (Pantoro, 2021). Flora surveys of parts of the application area recorded one dead *Daviesia microcarpa* individual at two locations within the application area, however no live specimens were identified (Mattiske, 2020a). As this species regenerates from seed it is likely to occur again when establishment and growth conditions are suitable (Pantoro, 2021). The proposed clearing is not likely to impact on the known location of *Daviesia macrocarpa*. An area extending 50 metres from the known location of the dead specimens has been excised from the application area by the proponent (Pantoro, 2021; GIS Database). This species is also known to occur near Southern Cross and is not restricted to the Norseman area (Western Australian Herbarium, 1998-).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Mattiske (2020a)
Pantoro (2021)
Western Australian Herbarium (1998-)

GIS Database:
- Pre-European Vegetation
- Threatened and Priority Flora

(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.

Comments Proposal is not likely to be at variance to this Principle

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the application area (GIS Database).

A flora and vegetation survey of the application area did not identify any TECs (Biota, 2020; Mattiske, 2020a).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Biota (2020)
Mattiske (2020a)

GIS Database:
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers

(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.

Comments Proposal is not at variance to this Principle

The application area falls within the Coolgardie Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 97% of the pre-European vegetation still exists in the Coolgardie Bioregion IBRA (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 9, 110, 125, 221, 524 and 3106 (GIS Database). These vegetation associations have not been extensively cleared as over 90% of the pre-European extent of these vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). The application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared (GIS Database).

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology Government of Western Australia (2019)

GIS Database:
- IBRA Australia

- Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

There are no permanent waterbodies within the application area (GIS Database). The application area intersects several ephemeral drainage lines and salt lakes (GIS Database).

Three vegetation types were identified within the application area that are associated with drainage lines; NS3, NS4 and NW14 (Mattiske, 2020b). These vegetation types are common within the local area.

Based on the above, the proposed clearing is at variance to this Principle. Potential impacts to vegetation growing in association with watercourses may be minimised by the implementation of a watercourse management condition.

Methodology Mattiske (2020b)

GIS Database:

- Hydrography, Lakes

- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal may be at variance to this Principle

The soils within the application area have been mapped as BB5, DD14, SV2 and Lb10 (Northcote et al., 1960-68).

Soil type BB5 is described as 'rocky ranges and hills of greenstones--basic igneous rocks: chief soils seem to be shallow calcareous loamy soils (Um5.11) and similar soils such as (Um5.41) and (Um1.43) in Sheet 10 areas, with shallow brown and grey-brown calcareous earths (Gc1.12) and (Gc1.22) below which weathered rock occurs at shallow depths. Associated soils are not described but may include alkaline red earths (Gn2.13) and narrow valleys with (Ug5.38) soils in Sheet 10 areas' (Northcote et al., 1960-68).

Soil type DD14 is described as 'flat to undulating land with small valleys occasionally broken by low narrow rocky hills and ridges, or tors and bosses; some block silcrete and silcrete fragments recorded in the area of Sheet 10; some clay pans and salt lakes with dunes and lunettes; some small dune tracts in the area of Sheet 10: chief soils are brown and grey-brown calcareous earths (Gc1.12) and (Gc1.22), mostly with loamy surface soils, but there are some areas with sandy surface soils and some (Gc2.22) soils and gilgais. Associated are various (Dr) soils such as (Dr1.73, Dr1.83) in valleys and flats; shallow red earths (Gn2.12) often with rock at 3 ft; siliceous sands (Uc1.2) on dunes and lunettes; and areas of undescribed soils. Country rock is present in some areas at depths of 3-5 ft, while in other sites non-calcareous clays occur at similar depths' (Northcote et al., 1960-68).

Soil type SV2 is described as 'saline valleys with some dunes including barchan forms--salt lake channels, mostly devoid of true soils, and their fringing areas: common soils are gypseous and saline loams (Um1.1) and (Um1.2), together with grey-brown highly calcareous earths (Gc1.12). Associated on fringe areas are various (Dy) soils as for unit Ya28; siliceous sand (Uc1.2) on dunes and lunettes; and other undescribed soils. Deposits of common salt, gypsum, lime, and alunite may occur' (Northcote et al., 1960-68).

Soil type Lb10 is described as 'gently undulating plains with some granitic bosses and tors; acid clays common below depths of 6*: chief soils are grey-brown highly calcareous earths (Gc1.12) commonly in intimate and complex association with hard alkaline yellow and yellow mottled, and red mottled soils (Dy2.83, Dy3.83, Dy3.73) and (Dr3.83, Dr3.43, Dr2.33). Associated are smaller areas of sandy yellow and yellow mottled soils (Dy4.43, Dy4.83, Dy5.43, and Dy5.83). As mapped, areas of units DD12, Ya29, and JY1 are included, as are small areas of many other soils such as those in the vicinity of granitic tors' (Northcote et al., 1960-68).

Noting that the local area and the area immediately surrounding the application area is highly vegetated; the proposed clearing is not likely to cause appreciable land degradation through salinity or water erosion. However, given the relatively large size of the proposed clearing and that the application area occurs on mostly brown and grey loamy soils, the proposed clearing may cause appreciable land degradation in the form of wind erosion. Potential erosion may be minimised by the implementation of a staged clearing condition.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology Northcote et al. (1960-68)

GIS Database:

- Imagery

(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 nearby conservation area.

Comments Proposal may be at variance to this Principle

The northern section of the application area is immediately adjacent to an 'un-named' nature reserve (GIS Database). The purpose of this nature reserve is for the conservation of flora and fauna (GIS Database). The proposed clearing is unlikely to have any significant impact on the environmental values of the nature reserve if potential weed issues are appropriately managed.

Based on the above, the proposed clearing may be at variance to this Principle. Potential impacts to the un-named nature reserve as a result of the proposed clearing may be minimised by the implementation of a weed management condition. Impacts to fauna may occur if species move outside the nature reserve into the adjacent application area. Potential impacts to fauna may be minimised by the implementation of a directional clearing condition, which requires the clearing to be undertaken in a slow, progressive manner in one direction to allow sufficient time for mobile fauna to escape.

Methodology GIS Database:
- DPaW Tenure

(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.

Comments Proposal is not likely to be at variance to this Principle

There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows.

The potential clearing of vegetation around tributaries of Lake Cowan and Lake Dundas has the potential to result in increased sediment loads. This will be minimised through installation of sediment control structures at locations where high sediment loads are anticipated or observed (Pantoro, 2021).

The groundwater within the application area is largely hypersaline and is consistent with the surrounding region. Given this, the proposed clearing is unlikely to cause deterioration in the quality of any groundwater (Pantoro, 2021).

The proposed clearing is unlikely to cause deterioration in the quality of underground water.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology Pantoro (2021)

GIS Database:
- Hydrography, Linear
- Public Drinking Water Source Areas

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The climate of the region is arid to semi-arid, with a low average rainfall of 200 to 300 millimetres per year (CALM, 2002). There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. The application area is located in a relatively flat to slightly undulating area which may on occasion be at risk of flooding following short intense rainfall events (Pantoro, 2021).

Some localised increase in surface runoff may occur where vegetation is cleared. However, the impact is unlikely to be detectable in the context of the range of the natural variability of runoff. Stormwater management controls will be constructed as necessary to direct rainfall away from open excavations (Pantoro, 2021).

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology CALM (2002)
Pantoro (2021)

GIS Database:

- Hydrographic Catchments - Catchments
- Hydrography, linear

Planning Instrument, Native Title, previous EPA decision or other matter.

Comments

The clearing permit application was advertised on 22 October 2021 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim over the area under application (DPLH, 2022). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are several registered Aboriginal Sites of Significance within the application area (DPLH, 2022). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity, Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The application area is part of a larger Norseman Gold Project area which was referred to the Environmental Protection Authority (EPA) under Part IV, section 38 of the *Environmental Protection Act 1986* on 25 March 2021. The EPA decided to 'not assess' the proposal on 20 September 2021 (Pantoro, 2021).

Methodology DPLH (2022)
Pantoro (2021)

4. References

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- Mattiske (2020a) Flora & Vegetation Assessment Norseman Gold Project, Norseman. Prepared for Pantoro Ltd, by Mattiske Consulting Pty Ltd, July 2020.
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- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 2 December 2021).

5. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government

DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T Threatened species:

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of ‘Specially Protected Fauna’ listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of ‘Rare Flora’ listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX**Extinct species**

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW**Extinct in the wild species**

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI**Migratory species**

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD**Species of special conservation interest (conservation dependent fauna)**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS**Other specially protected species**

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P**Priority species:**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

- P1 Priority One - Poorly-known species**
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
- P2 Priority Two - Poorly-known species**
Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
- P3 Priority Three - Poorly-known species**
Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
- P4 Priority Four - Rare, Near Threatened and other species in need of monitoring**
(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.