

Clearing Permit Decision Report

1. Application details and	
1.1. Permit application	details
Permit number:	9817/1
Permit type:	Purpose Permit
Applicant name:	Trigg Mining Ltd
Application received:	22 July 2022
Application area:	95 hectares
Purpose of clearing:	Mineral exploration and associated activities
Method of clearing:	Mechanical Removal
Tenure:	Exploration Licence 38/3065
	Exploration Licence 38/3483
	Exploration Licence 38/3537
	Exploration Licence 38/3544
Location (LGA area/s):	Shire of Laverton
Colloquial name:	Lake Throssell Project

1.2. Description of clearing activities

Trigg Mining Ltd proposes to clear up to 95 hectares of native vegetation within a boundary of approximately 56,460 hectares, for the purpose of mineral exploration and associated activities. The project is located approximately 184 kilometres northeast of the town of Laverton, within the Shire of Laverton.

The application is to allow for exploration activities on Lake Throssell. The large extent of the clearing footprint is necessary to address the progressive and dispersive nature of the exploration work. It is also difficult to plan the locations of access tracks and drill sites in advance due to the ground conditions and remoteness of the site. There are two permits that are currently active on the southern fringes of this lake. Both of these permits are also for exploration activities from Trigg Mining Ltd.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	30 September 2022
Decision area:	95 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 22 July 2022. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix E), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Glossary C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- impacts to conservation significant flora;
- impacts to conservation significant fauna;
- potential land degradation in the form of wind erosion;
- impacts to nearby conservation areas via run off; and
- increased incidence or intesity of flooding

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 can be minimised and managed to be unlikely to 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;
- avoid impacts to significant flora by creating buffer zones around them to prevent their clearing;
- conduct targeted pre-clearing Malleefowl surveys if clearing during the breeding season and avoid active Malleefowl mounds;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- limit the amount of disturbance to the islands of Lake Throssell;
- restrict clearing activities in inundated areas;
- commence exploration no later than three months after undertaking clearing to reduce the risk of erosion; and
- retain vegetative material and topsoil for rehabilitation and revegetation

1.5 Site Map

A site map of proposed clearing is provided in Figure 1 below.

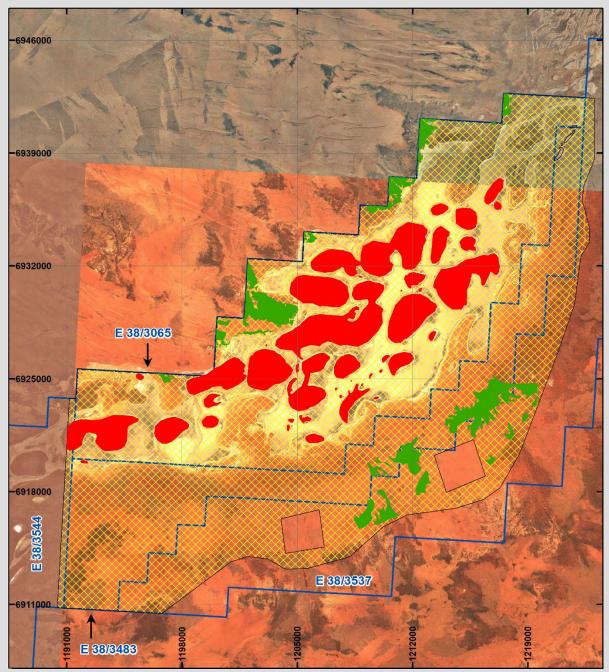


Figure 1. Map of the application area. The yellow area indicates the area within which authorised clearing can occur under the granted clearing permit. The red areas and green areas indicates the area where conditioned clearing can occur. CPS 9817/1

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 510 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)
- Mining Act 1978 (WA)

Relevant agreements (treaties) considered during the assessment include:

- Japan-Australia Migratory Bird Agreement
- China-Australia Migratory Bird Agreement
- Republic of Korea-Australia Migratory Bird Agreement

The key guidance documents which inform this assessment are:

- A guide to the assessment of applications to clear native vegetation (DER, December 2014)
- Procedure: Native vegetation clearing permits (DWER, October 2021)
- Technical guidance Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance Terrestrial Fauna Surveys for Environmental Impact Assessment (EPA, 2020)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The proponent reduced the initial application area by approximately 1,184 hectares to avoid areas where the Great Desert Skink and a potential novel species of *Tecticornia* were identified. An Environmental Management Plan (EMP) was submitted by Trigg Mining Ltd (2022). This document contains the following avoidance and mitigation measures:

- Trigg will ensure that identified conservation significant flora is not disturbed, through implementation of the following:
 - o 50 metres buffer zone around Seringia exastia flora species, where identified
 - o 50 metres buffer zone around identified locations of Priority 3 species Melaleuca apostiba
 - Avoiding disturbance to Sandalwood, where identified
 - o Areas where the potentially novel species of *Tecticornia* was identified will be avoided.
- Clearing will be carried out using a raised blade, where possible.
- Ground disturbance activities will be undertaken during daylight hours only
- Driving at night-time will be avoided wherever possible, to minimise fauna interactions.
- Staff are not to interfere with any nests or other habitats during field activities.
- An exclusion zone will be implemented for the area where the Great Desert Skink was identified to minimise potential impacts to this species.
- All staff must observe a 50 metres no-go buffer zone around any nests encountered, and not disturb any Malleefowl birds spotted in the field.

The Delegated Officer was satisfied that the applicant has made a reasonable effort 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 B) 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 identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora). 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. Biological values (fauna) - Clearing Principles (a) and (b)

Assessment

A fauna survey was conducted over 38,245.3 hectares of Lake Throssell and adjacent terrestrial habitats on April 2021. The habitats present in the application area (refer to section B.1) are common and widespread in the Central subregion of the Great Victoria Desert IBRA bioregion (Western Wildlife, 2021). For example Yeo Lake, which is located within the same lake system, contains similar habitat types as the ones present on Lake Throssell (DEC, 2009). Jennifer Wilcox (Western Wildlife) informed Craig Roberts (Trigg Mining) via email on 25 October 2021 that there were three conservation significant fauna species within CPS 9817/1 Page 3

the application area identified by the fauna surveys conducted by Western Wildlife (2021). These species are the Long-tailed Dunnart, the Brush-tailed Mulgara, and the Southern Marsupial Mole. In addition to these species, Western Wildlife (2021) also identified 11 conservation significant fauna species as likely to occur at Lake Throssell (refer to section B.2). The majority of the species are migratory shorebirds which are only likely to occur after heavy summer rainfall events when water collects in the salt lake (Western Wildlife, 2021). When the lake is dry, shorebirds will be absent (Western Wildlife, 2021). The fauna surveys conducted by Western Wildlife (2021) did not take place during summer when migratory birds are present in Australia. These surveys were conducted following two years of dry conditions. Therefore an accurate assessment of the presence of migratory birds could not be performed. Lake Throssell is not listed as an Internationally Important Site for migratory shorebirds of the East Asian-Australasian Flyway (EAAF) (Bamford et al., 2008). Although there are currently limited records of migratory shorebirds inhabiting the Lake Throssell area, this is due to a lack of surveys conducted during flooding and drying cycles (DBCA, 2022a). Migratory species are not always present at a site, but a particular site may have significance as a seasonal or ephemeral foraging, breeding or shelter area (Western Wildlife, 2021). Migratory shorebirds are only likely to occur after heavy summer rainfall and it is only at this time where an assessment can be made of the significance of this wetland (DBCA, 2022a).

Breakaways and habitats around the salt lake, particularly the islands, may have local importance as refugia for fauna particularly during fire events (Spectrum, 2021). Breakaway habitats are hard to work with exploration equipment, and are not associated with the mineral resource (brine) pursued by Trigg Mining Ltd, therefore breakaways will be preferentially avoided by exploration activities (Jenny Cookson (Trigg Mining Ltd) pers. comm., 2022). The islands can act as safe breeding grounds for shorebirds, away from predators (DBCA, 2022a). Island habitats and claypans associated with salt lakes are known to support diverse and potentially new or restricted species (Stantec, 2021).

Malleefowl (VU) are known to occur close to the application area. The application contains two vegetation units that contain suitable habitat for Malleefowl. These units are ATOSL and MATOSL (descriptions in section B.1). It is expected that the proposed clearing will only impact 1.5 hectares of native vegetation within the MATOSL community. No disturbance is proposed in the ATOSL community. The small impacts to potential Malleefowl habitat can be managed by conditions on the clearing permit.

Parts of the application area have been mapped as potential habitat for the Arid Bronze Azure Butterfly (CR) due to the presence of woodlands and eucalypts (DBCA, 2022b). This species has an obligate association with a sugar ant *Camponotus* sp. nr. *terebrans* and a key indicator of the presence of the butterfly is large colonies at the base of smooth bark eucalypts. The smooth bark eucalypt *Eucalyptus concinna* was recorded during the flora survey however, they were only sparsely recorded within spifinfex sandplains. Given, the sparse nature of the woodland habitat within the application area, it is considered that there is a low likelihood of the vegetation supporting a population of Arid Bronze Azure Butterfly. Exploration activities will also avoid disturbance of large trees and shrubs, including mallee species, to limit costs associated with exploration and to reduce environmental disturbance (Trigg Mining Ltd, 2022). Therefore the proposed clearing is not likely to have a significant impact for the Arid Bronze Azure Butterfly.

Areas of long unburnt spinifex provide habitat for the Night Parrot (CR) and the Sandhill Dunnart (EN) (DBCA, 2022b). The majority of the spinifex habitat within the application area was burnt in 2000 (GIS Database). Therefore, the application area is not likely to contain significant areas of long unburnt spinifex and is not likely to support significant populations of these species.

The Peregrine Falcon is likely to occur as a foraging visitor and may possibly breed in the application area. However, the application area is unlikely to be important for this species as its population is large and secure, and breeding habitat is absent (Western Wildlife, 2021).

The faunal assemblage of the study area is likely to be largely intact, as it is situated in a region of continuous habitat where habitat loss and fragmentation are minimal (Western Wildlife, 2021).

Conclusion

There is potential for conservation significant fauna to utilise the vegetation within the application. Trigg Mining Ltd has proposed specific measures to mitigate impacts on conservation flora species (refer to section 3.1). For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant flora and fauna can be managed by the proposed mitigation measures and conditions placed on the permit.

The applicant may have notification responsibilities under the EPBC Act for impacts to migratory birds, Malleefowl, Arid Bronze Azure Butterfly, Night Parrot, Sandhill Dunnart, Great Desert Skink and their habitats, as set out in the EPBC Act. The applicant has been advised to contact the federal Department of Water, Agriculture and the Environment (DAWE) to discuss EPBC Act referral requirements.

<u>Conditions</u>

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- clearing restrictions to prevent disturbance to inundates areas to protect migratory birds;
- clearing restrictions to minimise clearing in the islands of Lake Throssell;
- fauna management to prevent disturbance to Malleefowl mounds;
- flora management to prevent the loss of conservation significant flora; and
- slow directional clearing to allow terrestrial fauna to move into adjacent vegetation ahead of the clearing activity will
 minimise impact to individuals.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 5 August 2022 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (WC 2004/003) over the area under application (DPLH, 2022). This claim has been determined by the Federal Court 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 four 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.

Other relevant authorisations required for the proposed land use includes:

A Programme of Work approved under the Mining Act 1978.

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.

End

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Appendix A. Additional information provided by applicant				
Summary of comments	Consideration of comment			
Changes to application area to avoid conservation significant flora and fauna	The applicant reduced the application area to avoid zones where the Threatened Great Desert Skink and a potential novel <i>Tecticornia</i> species had been identified.			
Environmental Management Plan prepared by Trigg Mining Ltd	The applicant made updates to the Environmental Management Plan per request of the Environmental Officer.			
Fauna survey conducted by Western Wildlife in June 2021	This survey was provided per request of the Environmental Officer. It was used to assess principles (a) and (b).			
Flora and vegetation reconnaissance survey conducted by Maia in February 2021	This survey was provided per request of the Environmental Officer. It was used to assess principle (a) and (d).			
Targeted flora and vegetation survey conducted by Maia in October 2021	This survey was provided per request of the Environmental Officer. It was used to assess principles (a), (c), and (d).			
Preliminary aquatic ecology assessment of Lake Throssell conducted by Stantec in December 2021	This survey was provided per request of the Environmental Officer. It was used to assess principle (f).			

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	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 surrounded by native vegetation, conservation reserves, aboriginal reserves, and lakes (GIS Database).
Ecological linkage	According to available databases the application area does not form part of any mapped ecological linkages.
Conservation areas	The application area is not located within any known conservation areas. The closest mapped conservation area is Yeo Lake Nature Reserve and it is located 3.5 kilometres south from the application area (GIS Database).
Vegetation description	 The vegetation of the application area is broadly mapped as the following Beard vegetation associations: 24: Low woodland; <i>Allocasuarina cristata</i>; 84: Hummock grasslands, open low tree and mallee steppe; marble gum and mallee (<i>Eucalyptus youngiana</i>) over hard spinifex <i>Triodia basedowii</i> between sandhills; 125: Bare areas; salt lakes; and 676: Succulent steppe; samphire (GIS Database). A flora and vegetation survey was conducted over the application area by Maia during October 2021. The following vegetation types were recorded within the application area (Maia, 2021b): ASTSL: Tall sparse shrubland of <i>Acacia burkittii</i> with a sparse shrubland of <i>Eremophila miniata</i>, and isolated mixed low shrubs mainly of <i>Ptilotus obovatus, Frankenia laxiflora</i> and <i>F. cinerea</i> ATOSL: Tall open shrubland of <i>Acacia aptaneura</i> and / or <i>A. caesaneura</i> (narrow phyllode variant) with a mixed open shrubland mainly of <i>Eremophila latrobei</i> subsp. <i>latrobei</i>, <i>Scaevola spinescens</i> and a sparse Tussock Grassland of <i>Eriachne mucronata</i>. CLWL: Low woodland of <i>Casuarina obesa</i> with and open shrubland of <i>Acacia tysonni</i> MATOSL: Mixed <i>Acacia</i> tall open shrubland mainly of <i>Acacia pteraneura</i>, <i>A. aptaneura</i> and <i>A. ramulosa</i> var. <i>linophylla</i> with a sparse Tussock Grassland of <i>Eragrostis eriopoda, Eriachne helmsii</i>, and <i>Aristida contorta</i>. MLOSL: Mixed low open shrubland of <i>Frankenia laxiflora, Maireana pyramidata</i> and <i>M. amoena</i> with isolated mixed Tussock Grasses of <i>Enteropogon ramosus, Enneapogon caerulescens</i> and <i>Eragrostis laniflora</i>
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Characteristic	Details
	MLSSL: Low open mixed Samphire Shrubland mainly of <i>Tecticornia calyptrata, T. halocnemoides</i> subsp. <i>longispicata</i> and <i>T. pruinosa</i>
	MSSL: Mixed sparse shrubland mainly of <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> , Grevillea <i>juncifolia</i> subsp. <i>juncifolia</i> and <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i> with a sparse low shrubland of <i>Ptilotus obovatus</i> and a sparse Hummock Grassland of <i>Triodia schinzii</i> and/or <i>T. basedowii</i>
	THG (1): Open Hummock Grassland of <i>Triodia schinzii</i> with an open Forbland of <i>Lomandra leucocephala</i> subsp. <i>robusta</i> and a sparse low shrubland of <i>Jacksonia arida</i>
	THG (2): Open Hummock Grassland of <i>Triodia schinzii</i> with a mixed open shrubland mainly of <i>Acacia burkittii, A. prainii</i> and <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> and a mixed open low shrubland mainly of <i>Eremophila platythamnos</i> subsp. <i>exotrachys</i> and <i>Ptilotus obovatus</i>
	THG (3): Open Hummock Grassland of <i>Triodia basedowii</i> with an open mallee woodland of <i>Eucalyptus concinna</i> and/or <i>E. eremicola</i> subsp. <i>peeneri</i>
	The following fauna habitat types were identified within the application area (Western Wildlife, 2021):
	Salt lake: Water-holding depressions provide habitat for migratory shorebirds and other waterbirds after significant rain events that fill the lake.
	Samphire shrubland: Low shrublands of samphire (<i>Tuticorin spp.</i>) occur on the salt lake shores.
	Sand dunes: Loose sands provide habitat for fossorial reptiles. Eucalypts (where present) provide nesting habitat for birds and hollows/crevices for arboreal fauna. The dunes support an open eucalypt woodland over <i>Acacia</i> and <i>Eremophila</i> shrubland over spinifex (<i>Triodia sp.</i>).
	Gypsum dunes: Large casuarina and eucalypts provide tree hollows and crevices for birds, bats and arboreal reptiles. Dense leaf litter and fallen logs provide shelter for reptiles. <i>Eremophila</i> and <i>Grevillea spp.</i> provide seasonal resource for nectar-feeding birds. The gypsum dunes are sparsely vegetated with an open woodland of <i>Casuarina</i> over an open tall shrubland of <i>Acacia</i> , <i>Grevillea</i> and/or <i>Eremophila sp.</i> Leaf litter forms large mounds under the <i>Casuarina</i> trees, and the sparse vegetation may protect these mounds from fire, allowing them to persist for many years.
	Spinifex sandplain: Consolidated sands for burrowing mammals and reptiles. Eucalypts (where present) provide hollows and crevices for birds, bats and arboreal reptiles. Eucalypt and <i>Grevillea sp.</i> provide seasonal resource for nectar-feeding birds. Much of this habitat is open grassland, but there are areas with an open mallee woodland and small areas support a Marble Gum (<i>Eucalyptus gongylocarpa</i>) woodland. Spinifex sandplains are likely to support a diverse reptile assemblage.
	Mulga woodland: Hollows and crevices in large Mulga and eucalypts provide roosting and nesting habitat for birds, bats and arboreal reptiles. Where present, accumulations of leaf litter and fallen logs provide shelter for reptiles. Mulga trees and taller shrubs provide nesting habitat for birds, particularly where the Mulga occurs in groves or dense stands. The understory vegetation varies from spinifex (<i>Triodia sp.</i>) to tussock grass, the spinifex occurring where the soils are sandier. The canopy is a woodland of Mulga with mallee eucalypts, over an open shrubland of <i>Eremophila spp</i> .
	Breakaways: This habitat has crevices and exfoliating rock around the breakaway edges, that provides habitat for reptiles and mammals. Caves are absent. <i>Eremophila spp.</i> provide seasonal resource for nectar-feeding birds.
Vegetation condition	The vegetation survey (Maia, 2021b) indicates the vegetation within the proposed clearing area is Very Good to Good (Trudgen, 1991) condition.
	The full Trudgen (1991) condition rating scale is provided in Appendix D.
Climate and landform	The application area is located in an arid zone where the average annual rainfall (Laverton Station) is 235.2 millimetres (BoM, 2022a).
Soil description	The application area contains a variety of soil types (GIS Database). The soil units located within the application area are described by Northcote et al. (1960-68) as:

Characteristic	Details
	BY6: Scarplandbreakaways and residuals of various forms, cuestas, mesas, buttes, stony hillocks, and hills commonly with large bare slabs of silcrete; occasionally with rock outcrops, breccia, and pallid-zone materials; stone and gravel pavements are common; there is some marginal transgression by longitudinal sand dunes: chief soils are shallow stony sands, sandy loams, and loams often underlain by red-brown hardpan.
	SV10: Shallow valleys with lakes, clay pans, salt pans, calcrete (kunkar) platforms, sand dunes, kopi dunes, and calcareous dunes: chief soils are probably shallow loams. Associated are soils on the calcrete platforms and marginal to them; with some low gilgai on flanking saline plains. As mapped, there may be inclusions of adjoining units.
	Mx22: Plains often flanking areas of regional drainage (unit SV10); some longitudinal sand dunes: chief soils are alkaline red earths.
	My99: Plains with extensive gravel pavements and small tracts of longitudinal dunes: chief soils are shallow red earths and earthy loams underlain by a red-brown hardpan. Associated are other shallow soils on low silcrete and laterite residuals.
Land degradation risk	The land system where the application area is located has not been mapped. However, according to the Department of Primary Industries and Regional Development (DPIRD) (2020) the application area may occur on landforms similar to the Carnegie system. The Carnegie system is described as salt lakes and fringing level to gently sloping pains with saline alluvium and low sand dunes above surrounding saline plains. The lack of slope renders most of the system generally not susceptible to soil erosion except at lake margins where wind erosion may be exacerbated by loss of stabilising vegetation (DPIRD, 2020).
Waterbodies	The application area is located on Lake Throssell (GIS Database). Lake Throssell is a salt lake and it is listed in the Directory of Important Wetlands in Australia (DIWA) as a Wetland of National Importance due to it being a good example of a wetland type occurring within a biogeographic region in Australia and being a wetland of outstanding historical or cultural significance (Environment Australia, 2001).
Hydrogeography	The application area is located within the Goldfields Groundwater Area which is legislated by the <i>RIWI Act 1914</i> (GIS Database). The area of the proposed clearing located on the bed of Lake Throssell has a mapped groundwater salinity of over 35,000 milligrams per litre total dissolved solids which is described as brine (GIS Database). The area of the proposed clearing located south of Lake Throssell has a mapped groundwater salinity of 1000-3000 milligrams per litre total dissolved solids which is described as brackish to saline (GIS Database).
Flora	There was one Threatened flora species, and one Priority flora species identified within the application area (Maia, 2021b; Spectrum, 2022).
Ecological communities	The application area is not located within any known Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) (GIS Database). There are no records of TECs or PECs within 100 kilometres of the application area (GIS Database).
Fauna	There are three Priority fauna species found within the application area (Jennifer Wilcox (Western Wildlife) pers. comm., 2021; Western Wildlife, 2021). There are no Threatened fauna species found within the application area (GIS Database, Spectrum, 2022).

B.2. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Malleefowl	VU	Y	Y	5.1 km	Y
Buff-snouted Blind Snake	P2	Υ	Υ	3 km	Y
Brush-tailed Mulgara	P4	Y	Y	0 km	Y
Long-tailed Dunnart	P4	Υ	Υ	0 km	Y
Southern Marsupial Mole	P4	Y	Y	0 km	Y
Striated Grasswren	P4	Υ	Υ	0.25 km	Y
Peregrine Falcon	Other Specially Protected	Y	Y	>100 km	Y
Sharp-tailed Sandpiper	MI	Y	Y	>100 km	Ν
Red-necked Stint	MI	Y	Y	>100 km	Ν
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Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
Wood Sandpiper	MI	Y	Y	>100 km	Ν
Common Greenshank	MI	Y	Y	>100 km	Ν
Marsh Sandpiper	MI	Υ	Y	>100 km	Ν
Common Sandpiper	MI	Y	Y	>100 km	Ν
Oriental Plover	MI	Y	Y	>100 km	Ν

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

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): "Native vegetation should not be cleared if it comprises a high level of biodiversity." Assessment: The application area does not fall within any known PECs (GIS Database; Maia, 2021a; 2021b). The area proposed to be cleared has similar diversity to the surrounding areas (Maia, 2021b). The application area contains two flora species of conservation significance Seringia exastia (T) and Melaleuca apostiba (P3). There are also three fauna species of conservation significance that were identified within the application area and 11 others that are likely to occur within the application area (refer to section B.2) (Jennifer Wilcox (Western Wildlife) pers. comm., 2021; Western Wildlife, 2021). The weed species <i>Cenchrus ciliaris</i> (Buffel Grass) and <i>Tribulus terrestris</i> (Caltrop) were identified within the application area (Maia, 2021a). These species are not listed as Declared Pests or Weeds of National Significance. Weeds have the potential to significantly change the dynamics of a natural ecosystem and lower the biodiversity of an area. Conditions: To address the above impacts, the following management measures will be	May be at variance	Yes Refer to Section 3.2.1, above.
 required as conditions on the clearing permit: A weed management condition. A flora management condition providing a buffer around the priority flora recorded in the application area. 		
<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."	May be at variance	Yes Refer to Section 3.2.1, above.
Assessment:		
Western Wildlife (2021) identified seven fauna habitats within the application area (refer to "Vegetation description" on section B.1). These habitats are common and widespread in the region (Western Wildlife, 2021) where the application area is located. Therefore, they are not likely to represent a significant habitat for fauna of the region. However, due to the lack of adequate surveys, it is unknown if Lake Throssell contains critical habitat for migratory shorebirds.		
<u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."	At variance	No
Assessment:		

The area proposed to be cleared contains one Threatened flora species <i>Seringia exastia)</i> (Maia, 2021b). <i>Seringia exastia</i> is in the process of being reclassified. A recent taxonomic study has concluded that <i>S. exastia</i> and <i>S. evidence</i> are the same species, and the two species have been synopymised.		required?
<i>elliptica</i> are the same species, and the two species have been synonymised under the oldest name (<i>S. exastia</i>) (Binks et al., 2020). A nomination by the WA Threatened Species Scientific Committee (TSSC) to delist the species has recently been advertised on DBCA's website (DBCA, 2021; Maia, 2021b). Trigg Mining Ltd has committed to placing a 50 metres buffer zone around these species to prevent their clearing (Trigg Mining Ltd, 2022).		
Condition:		
A flora management condition can avoid impacts to Threatened flora by creating a buffer around the Threatened flora species located within the application area to prevent their clearing.		
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."	Not likely to be at variance	No
Assessment:		
The application area is not located within any known or mapped Threatened Ecological Communities (GIS Database; Maia, 2021a; 2021b). The vegetation found within the application area is not representative of any known TECs (Spectrum, 2022).		
Environmental value: significant remnant vegetation and conservation ar	eas	
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."	Not at variance	No
Assessment:		
The application area falls within the Great Victoria Desert Bioregion of the nterim Biogeographic Regionalisation for Australia (GIS Database). Over 99 bercent of the pre-European vegetation still exists in the Great Victoria Desert Bioregion (Government of Western Australia, 2019). The application area is broadly mapped as Beard vegetation associations 24, 84,125, and 676. These vegetation associations have not been extensively cleared as over 90 bercent of the pre-European extent of these vegetation associations remain uncleared at the bioregional and state level (Government of Western Australia, 2019).		
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 nearby conservation area."	May be at variance	No
Assessment:		
Yeo Lake Nature Reserve (managed by DBCA) has the potential to be mpacted due to increased run off from Lake Throssell (DBCA, 2022b). mpacts to Yeo Lake Nature Reserve can be minimised by rehabilitation efforts to reduce runoff from Lake Throssell.		
Environmental value: land and water resources		
<u>Principle (f):</u> "Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."	At variance	No
Assessment:		
A large part of the application area is located on Lake Throssell. Lake Throssell is an ephemeral salt lake in the Eastern Goldfields region of Western Australia and it is included in the Directory of Important Wetlands od Australia (Stantec, 2021). The proposed clearing has the potential to impact vegetation growing in association with this wetland. These impacts can be		

Assessment against the clearing principles	Variance level	Is further consideration required?
managed through a vegetation management condition on the clearing permit to avoid clearing of riparian vegetation where possible and maintain water flows.		
<u>Principle (g):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."	May be at variance	No
Assessment:		
The location where the application area is located is generally not susceptible to soil erosion, except at lake margins where wind erosion may be exacerbated by loss of stabilising vegetation (DPIRD, 2020). Noting the application area covers the southern and northern margins of Lake Throssell, the proposed clearing has the potential to cause appreciable land degradation.		
Condition:		
This impact can be managed by placing a staged clearing condition on the clearing permit to prevent areas from being exposed for a long period of time and prevent soil erosion.		
<u>Principle (i):</u> "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."	Not likely to be at variance	No
Assessment:		
The proposed clearing is not expected to cause deterioration in the quality of underground water. Given the small extent of the proposed clearing (95 hectares) compared to the size of Lake Throssell (32,000 hectares), the proposed clearing is not likely to cause deterioration in the quality of surface water (DBCA, 2022b).		
<u>Principle (j):</u> "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."	May be at variance	No
Assessment:		
Vegetation clearing may increase sedimentation deposition into Lake Throssell and therefore increase the likelihood of a flooding event following episodic filling of the lake (DBCA, 2022b).		
<u>Condition:</u> A rehabilitation condition can reduce the risk of sedimentation.		

Appendix D. 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.

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 E. Sources of information

E.1.GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations Schedule One Areas (DWER-057)
- 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)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments Catchments (DWER-028)
- Hydrography Inland Waters Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping Best Available (DPIRD-027)
- Soil Landscape Mapping Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

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4. Glossary

Acronyms:

BC Act	Biodiversity Conservation Act 2016. 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)
CPS 9817/1	

DWER EP Act	Department of Water and Environmental Regulation, Western Australia Environmental Protection Act 1986, Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (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	Rights in Water and Irrigation Act 1914, 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 <u>Threatened species:</u>

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.

Principles for clearing native vegetation:

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.