

1. Application details and outcomes

1.1. Permit application details

Permit number:	10585/1
Permit type:	Purpose Permit
Applicant name:	Northern Star (Carosue Dam) Pty Ltd
Application received:	11 April 2024
Application area:	225 hectares
Purpose of clearing:	Mineral Production and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Leases 31/210, 31/219, 31/220
Location (LGA area):	Shire of Menzies and the City of Kalgoorlie-Boulder
Colloquial name:	Qena Project

1.2. Description of clearing activities

Northern Star Resources proposes to clear up to 225 hectares of native vegetation within a boundary of approximately 340 hectares, for the purpose of mining (Northern Star Resources, 2024a). The project is located approximately 115 kilometres north-east of Kalgoorlie, within the Shire of Menzies and the City of Kalgoorlie-Boulder (GIS Database).

The application is to allow for the expansion of mining operations, including the Qena underground mine proposed at the existing Luvironza gold mine, and CDO Solar Farm Stage 3 (Northern Star Resources (2024b)).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	3 December 2024
Decision area:	225 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed, and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advertised the application for a public comment for a period of 21 days, and two submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix C), relevant datasets (Appendix C), supporting information provided by the applicant, including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Appendix A), 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;
- the loss of native vegetation that is suitable habitat for malleefowl (*Leipoa ocellata*); and
- potential land degradation in the form of wind erosion.

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.

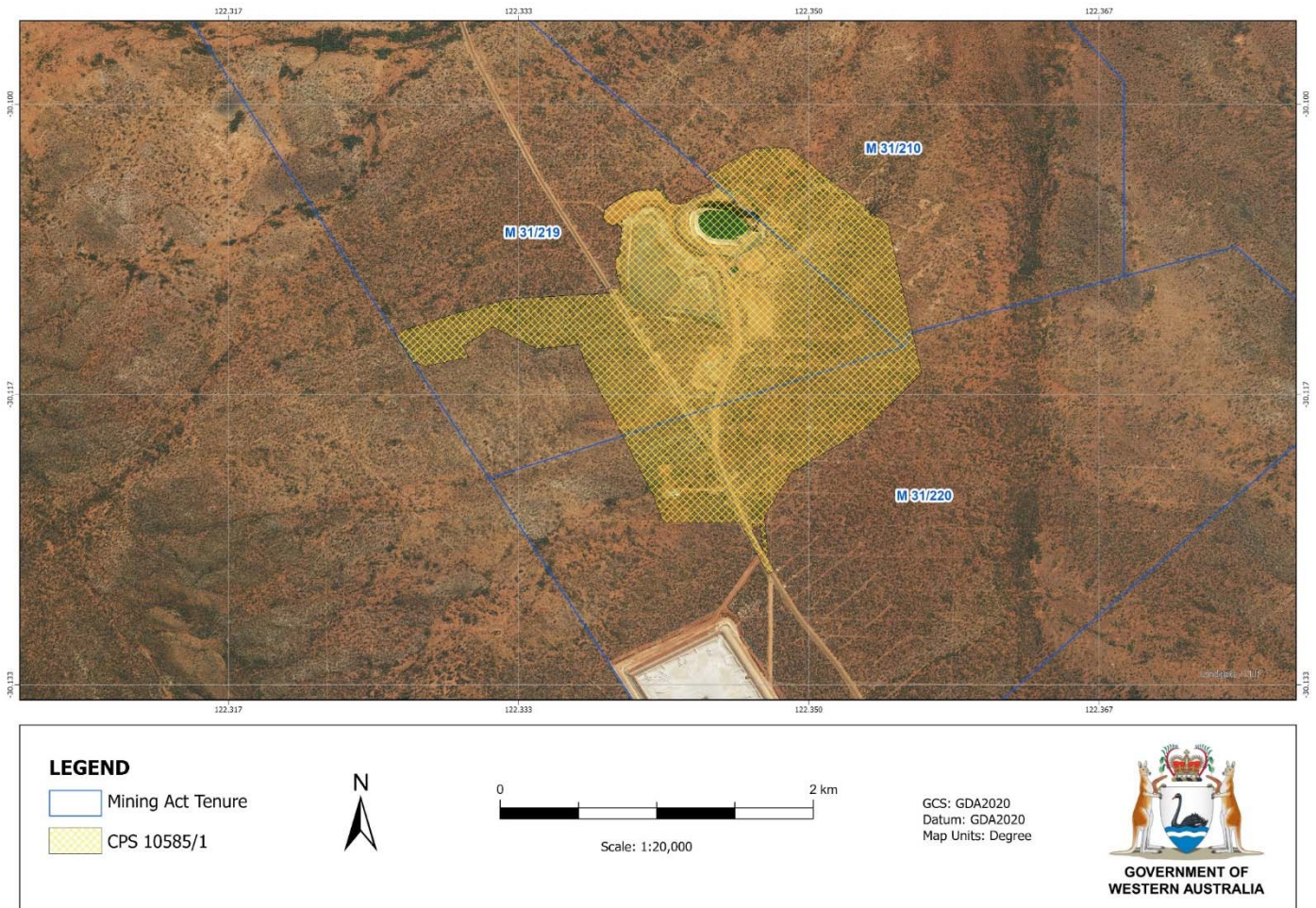
The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- staged clearing to minimise wind erosion;

- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity; and
- pre-clearance inspection for active Malleefowl mounds and placement of appropriate buffers.

1.5. Site map

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



2. Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit. Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Mining Act 1978* (WA)

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 – *Terrestrial Fauna 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

Northern Star Resources (2024b) have outlined they maintain the following internal databases, and avoidance and mitigation measures:

- a lift will be constructed on the existing Luvironza waste rock dump to reduce the amount of clearing required for additional waste rock dumps;
- the project was actively designed to avoid Malleefowl nesting mounds and minimise the area of clearing within suitable habitat as far as practicable to facilitate the project;
- proposed service corridor infrastructure (pipelines, powerlines, and access roads) will be constructed within existing service corridors and actively avoid any impact to Priority flora;
- the solar farm will be designed to minimise the spacing between solar panels to reduce the overall amount of clearing required;
- the associated construction laydown area will be constructed within an area that will be utilised for future mining activities, to reduce any temporary clearing requirements;
- the permit boundary was amended to reduce the total amount cleared, reduce the amount of Malleefowl habitat within the application area and exclude priority flora species (including more than a 50 metre buffer);
- within two weeks prior to undertaking any clearing, engage an environmental specialist to conduct an inspection of the area to be cleared to identify active (in use) Malleefowl (*Leipoa ocellata*) mounds.

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 C) 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). 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 Principle (b)

Assessment

A targeted Malleefowl survey (2,100 hectares), which included the survey area and surrounds, was undertaken in November 2023 (Alexander Holm & Associates, 2023b). Originally, the Permit Holder applied to clear 280 hectares of native vegetation within a boundary of 510 hectares, this included 23.7 hectares of Malleefowl breeding/foraging habitat. Following recommendation to reduce the permit boundary to limit the amount of Malleefowl habitat impacted, the application was amended to clear 225 hectares within a boundary of 340 hectares, this now included only 1.7 hectares of breeding/foraging habitat for Malleefowl (Alexander Holm & Associates, 2023b). The clearing of 1.7 hectares of breeding/foraging habitat is not considered significant as this habitat is extensive throughout the bioregion (Alexander Holm & Associates, 2023a). No evidence of Malleefowl was recorded within the application area, however, beyond the application area a live bird was sighted, four active nests and six inactive recent nests located, numerous fresh tracks found and much litter disturbance in favoured habitat (Alexander Holm & Associates, 2023b).

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on conservation significant fauna can be managed by undertaking a pre-clearance survey for active Malleefowl mounds and slow progressive clearing.

Conditions

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

- Fauna Management – Malleefowl: inspection for active Malleefowl mounds and placement of appropriate buffers; and
- Undertake slow progressive clearing to allow fauna to move into adjacent environments.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 19 April 2024 by the Department of Energy, Mines, Industry Regulation and Safety inviting submissions from the public. Two submissions were received in relation to this application.

There is one native title claim (Nyalpa Pirniku -WCD2023/002) over the area under application (DPLH, 2024). 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 no registered Aboriginal Sites of Significance within the application area (DPLH, 2024). 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 include:

- A Mining Proposal / Mine Closure Plan 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

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
The application area was revised to reduce the impact to Maleefowl habitat and excise priority flora.	The information supplied in conjunction with the amended application area will be considered in assessing the proposed clearing.

Appendix B. Details of public submissions

Summary of comments	Consideration of comment
Public submission from the City of Kalgoorlie Boulder was received (Public Submission, 2024a).	No objections to the clearing permit.
Public submission was received with comments regarding the lack of ethnobotanical or ethnozoology surveys; timing of flora surveys; fauna; water run-off; etc (Public Submission, 2024b).	Comments will be considered during the assessment of the proposed clearing. In addition, Northern Star has been consulting with WTAC to ensure the future mining project is developed in a manner that protects significant cultural values.

Appendix C. Site characteristics

C.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 (GIS Database). The area is located within the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation for Australia (IBRA) bioregion (GIS Database). The East Murchison subregion primary land uses include pastoralism (Alexander Holm & Associates, 2023c). The application area is located adjacent to existing mining operations and includes previously disturbed areas (GIS Database).
Ecological linkage	The application area is not known to be an important ecological linkage (GIS Database).
Conservation areas	There are no conservation areas in the vicinity of the application area (GIS Database). The nearest Department of Biodiversity Conservation and Attractions managed land is the Goongarrie National Park which is located approximately 60 kilometres south-west of the application area (GIS Database).
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <ul style="list-style-type: none"> 20: Low woodland; mulga mixed with <i>Allocasuarina cristata</i> and <i>Eucalyptus</i> sp. (GIS Database). <p>A flora and vegetation survey was conducted over the application area by Alexander Holm & Associates during October, 2023. The following three vegetation associations were recorded within the application area (Alexander Holm & Associates, 2023c):</p> <ul style="list-style-type: none"> CCAS: Calcareous casuarina acacia shrubland or woodland. Sparse, mostly degraded, <i>Maireana sedifolia</i> shrubland with colonizing shrubs including <i>Senna artemisioides</i> subsp. <i>filifolia</i>, <i>Eremophila scoparia</i>, <i>Acacia burkittii</i> and <i>A. hemiteles</i> with very sparse overstorey of <i>Acacia incurvaneura</i> or <i>Casuarina pauper</i>; PACS: Plain acacia casuarina shrubland. Very sparse to sparse, sometimes patchy acacia shrublands dominated by <i>Acacia incurvaneura</i>, <i>A. burkittii</i> and <i>A. hemiteles</i>, and very sparse lower shrubs including <i>Dodonaea lobulata</i>, <i>Senna artemisioides</i> subsp. <i>filifolia</i>, and <i>Scaevola spinescens</i> with overstoreys of <i>Casuarina pauper</i> or <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>; and PXHS: Plain mixed halophyte low shrublands. Very sparse to sparse halophytic shrublands dominated by <i>Maireana sedifolia</i> or <i>Atriplex vesicaria</i> or <i>Cratystylis subspinescens</i> or in poor condition dominated by <i>Senna artemisioides</i> subsp. <i>filifolia</i>, <i>Eremophila scoparia</i>, <i>E. arachnoides</i> subsp. <i>tenera</i>, with very sparse overstorey of <i>Casuarina pauper</i> and/or <i>Acacia incurvaneura</i>.
Vegetation condition	<p>The vegetation survey (Alexander Holm & Associates, 2023c) and aerial imagery indicates the vegetation within the proposed clearing area is in Degraded to Excellent (Trudgen, 1991) condition, described as</p> <ul style="list-style-type: none"> Excellent: Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement. 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.

Characteristic	Details
	<ul style="list-style-type: none"> 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. <p>The full Trudgen (1991) condition rating scale is provided in Appendix B.</p>
Climate and landform	The climate of the East Murchison subregion is characterised as semi-arid (Alexander Holm & Associates, 2010). The area experiences an average rainfall of 264.6 millimetres (BoM, 2024).
Soil description	The soils within the application area are mapped as: <ul style="list-style-type: none"> Moriarty Land System: Low greenstone rises and stony plains supporting chenopod shrublands with patchy eucalypt overstoreys; Deadman Land System: Calcareous plains supporting acacia, black oak and mallee shrublands/woodlands adjacent to salt lake systems (DPIRD, 2024).
Land degradation risk	Landform patterns in the general area comprise extensive sand plain, sub-parallel greenstone belts and breakaways with often extensive lower pediments which give way to level to very gently inclined sheet flood plains (Alexander Holm & Associates, 2010; 2023c).
Waterbodies	There are several ephemeral watercourses that transect the application area, however there are no permanent water surface features within the application area (GIS Database). Lake Rebecca is located approximately seven kilometres east of the application area (GIS Database).
Hydrogeography	The application area is not mapped within a proclaimed public drinking water area (GIS Database). The area is mapped within the Goldfields Groundwater Area, proclaimed under the Rights in Water Irrigation (RIWI) Act (GIS Database).
Flora	No threatened flora have been recorded within the application area (Alexander Holm & Associates, 2010; 2023c; GIS Database). Three priority flora species have been recorded within 40 kilometres of the application area, none have been recorded within the application area (Alexander Holm & Associates, 2023c).
Ecological communities	The application area is not located within any known or mapped Threatened Ecological Community (TEC) (Alexander Holm & Associates, 2010; 2023c; GIS Database).
Fauna	No conservation significant fauna species have been recorded within the application area (Alexander Holm & Associates, 2010; 2023c; GIS Database). There are records of three conservation significant fauna species within 50 kilometres of the application area (GIS Database).

C.2. Vegetation extent

	Pre-European area (ha)	Current extent (ha)	Extent Remaining %	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA Managed Lands
IBRA Bioregion Murchison	28,120,586.77	28,044,823.42	99.73	2,185,987.96	7.77
Beard vegetation associations - State					
Veg Assoc No. 20	1,295,103.39	1,292,474.58	99.80	250,985.57	19.38
Beard vegetation associations - Bioregion					
Veg Assoc No. 20	1,174,259.17	1,171,630.81	99.78	181,845.19	15.49

Government of Western Australia (2019)

C.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix C.1), and biological survey information (Alexander Holm & Associates, 2010; 2023c; Western Australian Herbarium, 1998; GIS Database), impacts to the following conservation significant flora and fauna required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)
<i>Eremophila arachnoides</i> subsp. <i>tenera</i>	3	Y	<1	17
<i>Hysterobaeckea ochropetala</i> subsp. <i>cometes</i>	3	Y	<35	28

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)
<i>Thryptomene eremaea</i>	2	Y	<5	13

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

C.4. Fauna analysis table

Species name	Common Name	Conservation status	Distance of closest record to application area (km)	Suitable habitat features? [Y/N]
<i>Aspidites ramsayi</i> (southwest subpopulation)	woma (southwest subpopulation)	P1	<47	N
<i>Falco peregrinus</i>	peregrine falcon	OS	<41	Y
<i>Leipoa ocellata</i>	Malleefowl	VU	<2	Y

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

Appendix A. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> "Native vegetation should not be cleared if it comprises a high level of biodiversity."</p> <p><u>Assessment:</u></p> <p>Alexander Holm & Associates recorded 129 flora taxa representing 30 families within the survey area (2,200 hectares), which included the survey area and surrounds (Alexander Holm & Associates, 2023c). No threatened or flora species have been recorded within the application area (Alexander Holm & Associates, 2023c; GIS Database). There are no priority or ecological communities within the application area and the vegetation communities present are present within the surrounding bioregion. No weeds listed as Weeds of National Significance or Declared Pests under the <i>Biosecurity and Agriculture Management Act 2007</i> (BAM Act) were recorded in the survey area (Alexander Holm & Associates, 2023c).</p>	Not likely to be at variance	No
<p><u>Principle (b):</u> "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains foraging and breeding habitat for Malleefowl (<i>Leipoa ocellata</i>) (Alexander Holm & Associates, 2010; 2023b; 2023c; GIS Database). The habitat present within the application area may be utilised by other conservation significant fauna species (e.g. peregrine falcon (<i>Falco peregrinus</i>), however the vegetation is considered to be widespread across the bioregion and the proposed clearing is not considered to lead to a significant impact.</p>	At variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."</p> <p><u>Assessment:</u></p> <p>There are no known records of Threatened flora within the application area (GIS Database). Flora surveys of the application area did not record any species of Threatened flora (Alexander Holm & Associates, 2023c; GIS Database).</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."</p> <p><u>Assessment:</u></p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
There are no known Threatened Ecological Communities (TECs) located within the application area and the flora and vegetation survey did not identify any TECs (Alexander Holm & Associates, 2023c; GIS Database).		
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The extent of the native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area.</p>	Not at variance	No
<p><u>Principle (h):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas (GIS Database).</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>No permanent watercourses are present within the application area (GIS Database). There are several ephemeral watercourses that traverse through the application area and potential impacts to riparian vegetation may be minimised through the implementation of a vegetation management and staged clearing condition.</p>	At variance	No
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The application area is situated within two land systems; Deadman and Moriarty. The Deadman land system is generally not prone to erosion, while the Moriarty land system is moderately susceptible to erosion (Pringle et al., 1994). Due to the large area of native vegetation proposed to be cleared (225 hectares), potential land degradation impacts as a result of the proposed clearing may be minimised by the implementation of a staged clearing condition.</p>	May be at variance	No
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>Given no significant watercourses, wetlands or Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality (GIS Database).</p>	Not likely to be at variance	No
<p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>There are no permanent watercourses 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. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.</p>	Not likely to be at variance	No

Appendix B. Vegetation condition rating scale

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

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

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

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

C.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Contours (DPIRD-073)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Interim Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape 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)

C.2. References

- Alexander Holm & Associates (2010) Environmental Assessment: Proposed Expansion of Whirling Dervish Mine. Report prepared for Saracen Gold Mines Pty Ltd, November 2010.
- Alexander Holm & Associates (2023a) An assessment of impacts on Malleefowl of proposed Qena Gold Mine. Report prepared for Northern Star Resources Limited, December 2023.
- Alexander Holm & Associates (2023b) Targeted Malleefowl Survey M31/219, M31/210, M31/220 & M31/285. Report prepared for Northern Star Resources Ltd, November 2023.
- Alexander Holm & Associates (2023c) Vegetation, Flora and Fauna Survey: M31/219, M31/210, M31/220 And M31/285. Report prepared for Northern Star Resources Ltd, December 2023.
- Bureau of Meteorology (BoM) (2024) Bureau of Meteorology Website – Climate Data Online, Weather Station: Kalgoorlie (012038). Bureau of Meteorology. <https://reg.bom.gov.au/climate/data/> (Accessed 24 June 2024).
- Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.
- Commonwealth of Australia (2008) Species Profile and Threats Database. Department of Climate Change, Energy, the Environment and Water, Australia. <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> (Accessed XX Month 2024).
- Department of Environment Regulation (DER) (2014) *A guide to the assessment of applications to clear native vegetation*. Perth. https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2024) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 24 June 2024).
- Department of Primary Industries and Regional Development (DPIRD) (2024) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. <https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f> (Accessed 24 June 2024).
- Department of Water and Environmental Regulation (DWER) (2021) Procedure: Native vegetation clearing permits. Joondalup. https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.pdf
- Environmental Protection Authority (EPA) (2016) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment. http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf
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4. 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)
DCCEEW	Department of Climate Change, Energy, the Environment and Water, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia (now DEMIRS)
DMP	Department of Mines and Petroleum, Western Australia (now DEMIRS)
DoEE	Department of the Environment and Energy (now DCCEEW)
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>Environment 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.

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.