



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	9782/1
Permit type:	Purpose Permit
Applicant name:	Evolution Mining Limited
Application received:	22 June 2022
Application area:	648 hectares
Purpose of clearing:	Mineral Production and Associated Activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Lease 15/669 Mining Lease 15/993 Mining Lease 16/309 Miscellaneous Licence 16/104
Location (LGA area):	Shire of Coolgardie
Colloquial name:	Golden Hind, Hornet and Pegasus Projects

1.2. Description of clearing activities

Evolution Mining Limited (Evolution) proposes to clear up to 648 hectares of native vegetation within a boundary of approximately 649 hectares, for the purpose of mineral production and associated activities. The project is located approximately 25 kilometres north of Coolgardie, within the Shire of Coolgardie.

The application is to allow for mining of the Golden Hind, Hornet and Pegasus gold deposits, as part of Evolution's existing Mungari Gold Operations (MGO) (Evolution, 2022). The Projects are located within a 1 kilometer radius of the Rubicon-Hornet-Pegasus (RHP) underground mine. Mining at RHP began in 2002 with the Rubicon Stage 1 Open Pit. In 2008, underground mining of the Rubicon, Hornet and Pegasus deposits commenced via a portal in the Rubicon pit and has been actively mined since (Evolution, 2022).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	25 August 2022
Decision area:	648 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 June 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 A), relevant datasets (Appendix D), 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 B), 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;
- potential impacts to riparian vegetation;
- 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;
- commence purpose for which clearing was undertaken (mining and associated activities) no later than three months after undertaking clearing to reduce the risk of erosion;
- where practicable, avoid clearing riparian vegetation; and
- engage an environmental specialist to conduct a site inspection of the clearing area to identify Malleefowl habitat prior to clearing during 1 September and 31 January.

2. Legislative context

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

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

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

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *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 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant, demonstrating that impacts to environmental values have been considered and planned for where appropriate. The proposed commitments to manage and mitigate environmental impacts outlined by Evolution Mining Limited are summarised below (Evolution, 2022):

- In the instance where the proposed works unexpectedly intercept any threatened or priority flora / vegetation, Evolution will cease work and seek independent management advice;
- Evolution's Internal Surface Disturbance Permit Application System is utilised on site to assess all upcoming clearing for significant flora, vegetation, fauna or habitats;
- Machinery, vehicles and equipment to be cleaned before moving sites;
- Minimise disturbance to soil and native vegetation;
- Practising good weed hygiene;
- Training and awareness of weed management and control;
- Inspections of disturbed areas and topsoil stockpiles;
- Clean water should be diverted around the disturbance footprints to the downstream environment to prevent contamination of clean water catchments;
- Flood mitigation measures are required to prevent flood ingress to open pits and mine infrastructure areas, particularly the Hornet Open Pit;
- Drainage around operational areas should be designed to prevent prolonged ponding following rainfall events; and
- Surface water management infrastructure must incorporate measures to avoid excessive scour, erosion and sediment transport.

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 A), survey data,

current datasets and other supporting information, 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 (vegetation and fauna) and land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora and fauna) - Clearing Principles (a & b)

Assessment

The clearing permit application area is located within the Eastern Goldfields subregion of the Interim Biogeographic Regionalisation for Australia (IBRA) Coolgardie Bioregion (GIS Database). The Eastern Goldfield subregion is characterised by gently undulating plains interrupted by low hills and ridges of Archaean greenstones, supporting mallees, *Acacia* thickets and shrub-heaths on sandplains and diverse *Eucalyptus* woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. The subregion is rich in endemic *Acacia* species (CALM, 2002).

The application area falls within the area known as the Great Western Woodlands, which represents the largest and most intact eucalypt woodland remaining in southern Australia and is one of the best examples of its type in the world (DEC, 2010). The Great Western Woodlands covers a total area of approximately 16 million hectares, and is recognised for its flora and fauna species richness and high number of endemic flora species (Botanica, 2021). However, at approximately 648 hectares in size, the clearing permit application area represents approximately 0.004% of the area covered by the Great Western Woodlands, and the proposed clearing is unlikely to have any significant impact on the conservation values of the Great Western Woodlands.

A flora and vegetation survey of the application area was conducted by Botanica Consulting (2020) during September 2020 and in September 2010 (Botanica, 2010). The desktop review identified 829 vascular flora species as occurring within 40 kilometres of the application area, including 87 introduced (weed) species. The most diverse families were Fabaceae (107 species), Asteraceae (106 species) and Myrtaceae (101 species). Significant genera were *Eucalyptus* (55 species), *Acacia* (54 species) and *Eremophila* (38 species). Of these species, 45 are of conservation significance, which consisted of three Threatened, 16 Priority 1, six Priority 2, 16 Priority 3 and four Priority 4 species. These species were assessed for distribution and known habitat to determine their likelihood of occurrence within the application area. The assessment identified one significant flora species as likely (previously recorded) to occur within the survey area; *Notisia intonsa* (P3). However, the Botanica (2010) flora survey determined that the vegetation community (*Casuarina* tall shrubland) associated with this record is unsuitable for the presence of this species, and this is likely an incorrect record (Botanica, 2020). Furthermore, *Notisia intonsa* was not identified within the application area during the September 2020 field survey, despite considerable effort to locate this species (Botanica, 2020). A further nine species were assessed as possibly occurring in the survey area, consisting of five Priority 1, one Priority 2, two Priority 3 and one Priority 4 (See Appendix A.2 for list of species). Suitable habitat for these species is seen throughout the greater Eastern Goldfields sub-region and Coolgardie bioregion and are not limited to the application area only. Furthermore, there are known records of each species within the broader region (GIS Database). As such, the proposed clearing is unlikely to have a significant impact to these populations on a local or regional scale. No threatened or Priority flora were recorded within the application area during the field survey (Botanica, 2020; Evolution, 2022).

No Threatened or Priority Ecological Communities (TEC/PECs) were identified as potentially occurring in the application area and the field assessment of the application did not record any TEC/PECs (Botanica, 2020; Evolution, 2022).






A fauna survey of the application area and surrounds was conducted by Botanica (2020) during September 2020. A total of 326 fauna taxa have been recorded within a 40 kilometre radius of the application area, consisting of 149 bird, 29 mammal, 73 reptile, six amphibian, one fish and 68 invertebrate taxa including nine introduced (feral) species (Botanica, 2020). The desktop review identified 14 fauna species of conservation significance as previously being recorded in the general area, consisting of eight Threatened species, two Priority 3 species, one Priority 4 species and two migratory or otherwise protected species. Habitat and distribution data was used to determine the likelihood of occurrence within the application area. The assessment identified three conservation significant fauna species as potentially occurring in the application area, as well as migratory shorebirds. Potentially occurring species include (Botanica, 2020; GIS Database):

- **Grey Falcon (Vu) (*Falco hypoleucos*)** - This species is sparsely recorded throughout inland Australia. Suitable habitat may be present within the application area but is considered unlikely to represent breeding or critical habitat. As such, significant impact is considered unlikely.
- **Malleefowl (Vu) (*Leipoa ocellata*)** - This species is occasionally recorded in the general area with the nearest record approximately 2 kilometres southwest of the survey area (GIS Database). Potential habitat within the application area appears marginal/or unsuitable for breeding, however occasional transients could potentially occur. No evidence of Malleefowl activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the survey area.
- **Peregrine Falcon (OS) (*Falco peregrinus*)** - Suitable habitat may be present within the application area, however, it is considered part of larger home range and is considered unlikely to breed in the application area.
- **Migratory Shorebirds (Mi) (Various species)** - May utilise ephemeral lakes and fringing vegetation within the application area during flood events; however, the fringing vegetation is of reduced quality, being subjected to multiple disturbances including historic mining and exploration, grazing, tracks and unlikely to support migratory bird populations/breeding events.

- **Arid Bronze Azure Butterfly (Cr) (*Ogyris subterrestris petrina*)** (GIS Database) – This species has been assessed as unlikely to occur. It is only known to be extant at two locations within the Wheatbelt Region and is presumed extinct at another location within the Goldfields Region (Lake Douglas approximately 17km south-east of the survey area) (Botanica, 2020). Suitable habitat for host ant is unlikely to be present. Furthermore, the survey area has been subject to previous mining/exploration and pastoral disturbance and is unlikely to provide floristically diverse habitat. The survey area has been subject to soil disturbance which adversely affects the host ant (Botanica, 2020).

No evidence of Threatened or Priority fauna species were observed during the survey, including no evidence of Malleefowl nesting mounds or other activity (Botanica, 2020). However, suitable Malleefowl habitat may be present within the application area.

A total of five broad scale terrestrial fauna habitats were identified, based on vegetation and associated landforms identified during the flora and vegetation assessment, with mixed *Eucalyptus* woodland being the most extensive (456 ha, 70.3%). The extent of the identified fauna habitats and a summary description of each are provided below.

Fauna Habitat Description	Area (ha)	Representative Photo
Open Eucalyptus Woodland	456 ha (70.3%)	
Chenopod Low Open Shrubland	100 ha (15.4%)	
Melaleuca Shrubland	46 ha (7.1%)	
Casuarina Open Forest	25 ha (3.8%)	
Bare Lakes / Playa	22 ha (3.4%)	

While habitats for the fauna species listed above are considered possibly suitable, some or all may be marginal in extent or quality, and therefore the fauna species considered as possibly occurring are likely to visit the area for short periods as infrequent vagrants (Botanica 2020). Nonetheless, given Malleefowl have been recorded approximately 2 kilometres from the application area and suitable habitat may be present within the application area, a fauna management condition is required to minimise potential impacts to Malleefowl habitat.

Conclusion

Based on the above assessment, the proposed clearing may result in the introduction of weeds and potential impacts to Malleefowl habitat.

For the reasons set out above, it is considered that the impacts of the proposed clearing on the introduction of weeds and potential impacts to Malleefowl fauna habitats can be managed by taking steps to minimise the risk of the introduction and spread of weeds and engaging an environmental specialist to conduct a site inspection to identify Malleefowl mounds and critical habitat prior to clearing.

Conditions

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

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds; and
- Fauna Management - engage an environmental specialist to conduct a Malleefowl inspection prior to clearing, where clearing is to occur within their breeding season (1 September – 31 January).

3.2.2. Land and water resources - Clearing Principle (f)

Assessment

There are no permanent water courses or wetlands within the application area. An ephemeral drainage line exists on the west side of the application area and an ephemeral salt lake (Kopai Lake) exists in the south-east corner of the application area (GIS Database; Evolution 2022). While Kopai Lake is an ephemeral system, it is subject to riparian vegetation and vegetation associated with salt lakes.

The application area contains one vegetation type that is growing in the riparian zone of Kopai Lake (Botanica, 2020). This vegetation type comprises 46 hectares and represents approximately 7.1% of the application area (Botanica, 2020). The vegetation type is listed below:

SLP-MF1 - *Melaleuca pauperiflora* subsp. *pauperiflora* *Melaleuca lateriflora* subsp. *lateriflora* mid shrubland over *Ptilotus obovatus* var. *obovatus*, *Maireana triptera* low open shrubland.

Conclusion

Based on the above, impacts to riparian vegetation are considered likely. However, given the riparian area is unlikely to be completely avoidable during clearing activities and that the extent of the riparian zone comprises approximately 7.1% of the clearing area only, impacts to the riparian zone are considered to be minimised by avoiding clearing of riparian vegetation, where practicable.

Conditions

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

- Vegetation Management – avoid clearing riparian vegetation where practicable.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 12 July 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 are two native title claims over the area under application (DPLH, 2022). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. 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, 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 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. Site characteristics

A.1. Site characteristics

Characteristic	Details												
Local context	The area proposed to be cleared part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is adjacent to existing mining operations. It is surrounded by mining tenements, conservation areas and is within the Mungari Pastoral lease.												
Ecological linkage	According to available databases, there are no formal ecological linkages within the application area (GIS Database).												
Conservation areas	The application is not within any conservation areas (GIS Database). The nearest conservation area is the Kurrawang Nature Reserve approximately 12 kilometres south east of the application area (Evolution, 2022).												
Vegetation description	<p>The vegetation of the application area is broadly mapped as the following Beard vegetation associations:</p> <p>468: Medium woodland; salmon gum & goldfields blackbutt; 125: Bare areas; salt lakes; and 540: Succulent steppe with open low woodland; sheoak over saltbush (GIS Database).</p> <p>A flora and vegetation survey was conducted over the application area by Botanica Consulting during October, 2020 (the flora survey). The following vegetation communities were recorded within the application area (Botanica, 2020):</p> <p>CLP-EW1 – <i>Eucalyptus salmonophloia</i>, <i>Eucalyptus salubris</i> and <i>Eucalyptus lesouefii</i> low woodland over <i>Eremophila scoparia</i>, <i>Eremophila decipiens</i> mid shrubland over <i>Atriplex vesicaria</i>, <i>Olearia muelleri</i> low shrubland.</p> <p>CLP-EW2 – <i>Eucalyptus clelandii</i> closed woodland over <i>Olearia muelleri</i> low sparse shrubland.</p> <p>RP-CFW1 – <i>Casuarina pauper</i> open forest over <i>Acacia hemiteles</i> mid open shrubland over <i>Atriplex nummularia</i> low open shrubland.</p> <p>CLP-RMNV1 - Open mixed chenopod shrubland</p> <p>CD-CSSSF1 - <i>Tecticornia indica</i> subsp. <i>indica</i> low open shrubland</p> <p>SLP-EW1 - <i>Eucalyptus clelandiorum</i> woodland over <i>Eremophila parviflora</i>, <i>Exocarpos aphyllus</i> open shrubland.</p> <p>SLP-MF1 - <i>Melaleuca pauperiflora</i> subsp. <i>pauperiflora</i>, <i>Melaleuca lateriflora</i> subsp. <i>lateriflora</i> mid shrubland over <i>Ptilotus obovatus</i> var. <i>obovatus</i>, <i>Maireana triptera</i> low open shrubland.</p>												
Vegetation condition	<p>The vegetation survey (Botanica, 2020) indicate the vegetation within the proposed clearing area is in Good to Completely Degraded (Keighery, 1994) condition:</p> <table border="1"> <thead> <tr> <th>Condition Rating</th> <th>Area (ha)</th> <th>Area (%)</th> </tr> </thead> <tbody> <tr> <td>Good</td> <td>632</td> <td>97.4</td> </tr> <tr> <td>Completely Degraded</td> <td>17</td> <td>2.6</td> </tr> <tr> <td>Total</td> <td>649</td> <td>100.0</td> </tr> </tbody> </table> <p>The full Keighery (1994) condition rating scale is provided in Appendix C.</p>	Condition Rating	Area (ha)	Area (%)	Good	632	97.4	Completely Degraded	17	2.6	Total	649	100.0
Condition Rating	Area (ha)	Area (%)											
Good	632	97.4											
Completely Degraded	17	2.6											
Total	649	100.0											
Climate and landform	The climate of the region is semi-arid, with an average rainfall of approximately 264 millilitres per year (BoM, 2022). Landforms within the application area are described as flats, low lying areas, slight rises, undulating plains, salt lakes and clay/loam plains (Botanica, 2020).												
Soil description	The soil is mapped as (DPIRD, 2022): 265k9: Gently undulating valley plains and pediments; some outcrop of basic rock 265n6: Salt lakes and their associated areas												

Characteristic	Details
Land degradation risk	Based on erosion tests conducted by Soilwater Consultants (2021), land degradation in the form of erosion is likely to occur following clearing of vegetation and heavy rainfall events.
Waterbodies	<p>According to available databases, no permanent water bodies are location within the application area (GIS Database).</p> <p>An ephemeral salt lake (Kopai Lake) is located within the south-east corner of the application area (Botanica, 2020). Along the western margin of the application area, a periodic drainage line links up the local salt lake system and only flows during large rainfall events (Soilwater Consultants, 2021).</p>
Hydrogeography	<p>There are no public drinking water sources within or within proximity to the application area (GIS Database). The application area is within the Goldfields Groundwater Area, proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (GIS Database).</p> <p>Groundwater depths within the region are typically between 5 – 20 metres below ground level. Groundwater depths within the application area range between 10 – 20 metres below ground level (Evolution, 2022). Groundwater in the region is generally hypersaline with Total Dissolved Solids (TDS) reaching up to 150, 000 milligrams per litre (Evolution, 2022).</p>
Flora	<p>There are records of a Priority 3 species within the application area (<i>Notisia intonsa</i>) and records of 15 Priority flora species within a 20 kilometre radius of the application area. There are no records of Threatened flora within or nearby (20 kilometre radius) the application area (GIS Database).</p> <p>From the desktop component of the flora survey, 45 conservation significant flora species were identified within 40 kilometres of the application area, with 10 species considered likely or possible to occur within the application area (see appendix A.2). No Threatened or Priority flora were recorded within the application area during the field survey (Botanica, 2020).</p>
Ecological communities	There are no Threatened or Priority Ecological Communities (TEC/PEC) within the application area. The nearest Ecological Community (Emu Land System PEC) is 50 kilometres north-east of the application area (GIS Database).
Fauna	<p>There are nine records of conservation significant fauna within a 20 kilometre radius of the application area (GIS Database). The identified species include:</p> <ul style="list-style-type: none"> • <i>Leipoa ocellata</i> (Malleefowl) (Vu) • <i>Ogyris subterrestris petrina</i> (Arid Bronze Azure Butterfly) (Cr) <p>Four conservation significant fauna species were identified as possibly occurring within the application area, however, no evidence of conservation significant fauna were recorded within the application area during the fauna survey (Botanica, 2020).</p>

A.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix D.1), and survey information (Botanica, 2020), assessment of the likelihood of occurrence of the following conservation significant flora required further consideration.

Species name	Conservation status	Preferred habitat	Assessment	Likelihood within the application area
<i>Acacia websteri</i>	Priority 1	Red sand, clay or loam. Low-lying areas, flats.	Habitat possibly present.	Possible
<i>Phebalium appressum</i>	Priority 1	Yellow sandplain.	Habitat likely to be present.	Possible
<i>Ptilotus procumbens</i>	Priority 1	Red clay.	Habitat possibly present.	Possible
<i>Ptilotus rigidus</i>	Priority 1	-	Widespread records in region.	Possible
<i>Rhodanthe uniflora</i>	Priority 1	Brown earth. Open eucalyptus woodland.	Habitat likely to be present.	Possible

Species name	Conservation status	Preferred habitat	Assessment	Likelihood within the application area
<i>Eremophila praecox</i>	Priority 2	Red/brown sandy loam. Undulating plains.	Habitat likely to be present.	Possible
<i>Angianthus prostratus</i>	Priority 3	Red clay or loamy soils. Saline depressions.	Habitat possible present.	Possible
<i>Notisia intonsa</i>	Priority 3	Lake shore, moist red sand.	Annual, previously listed on DBCA database as occurring within the survey area; however, record location appears incorrect (not located in suitable habitat).	Likely
<i>Phlegmatospermum eremaeum</i>	Priority 3	Stony loam.	Extensive but sparse records in the region.	Possible
<i>Eucalyptus jutsonii</i> subsp. <i>jutsonii</i>	Priority 4	Red to pale orange deep sands. Undulating areas and on dunes.	Habitat may be present.	Possible

‘-’ denotes missing or lack of information.

Appendix B. 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>The area proposed to be cleared does not contain locally or regionally significant flora or assemblages of plants. There are no known TEC/PECs within the application area or surrounds.</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> “Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</p> <p><u>Assessment:</u></p> <p>There is potential suitable habitat for conservation significant fauna within the application area (Malleefowl <i>Leipoa ocellata</i>, Grey Falcon <i>Falco hypoleuca</i>, Peregrine Falcon <i>Falco peregrinus</i> and Migratory wader (various species)), however, no evidence of these species were recorded during the fauna survey (Evolution, 2022; Botanica, 2020).</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (c):</u> “Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain habitat for Threatened flora species. No Threatened flora were identified during the flora survey and there are no records of Threatened flora within a 20 kilometre radius of the application area.</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> <p>There are no known TECs within the application area (GIS Database). No TECs were identified during a flora and vegetation survey of the application area (Botanica, 2020; Evolution, 2022).</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		

Assessment against the clearing principles	Variance level	Is further consideration required?
<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 application area occurs within the Coolgradie Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, in which approximately 98.0% of the pre-European vegetation remains (GIS Database; Government of Western Australia, 2019).</p> <p>The vegetation within the application area has been mapped as Beard vegetation association 125, 468 and 540 (GIS Database; Botanica, 2020). These vegetation associations are well represented at both a state and bioregional level (>90% Pre-European extent remaining) (Government of Western Australia, 2019). Given the amount of vegetation remaining in the local area and bioregion, the vegetation proposed to be cleared is not considered to represent remnant vegetation.</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 (approximately 12 kilometres), the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.</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>There are no permanent watercourses within the application area (GIS Database). Kopai Lake (an ephemeral salt lake) and its riparian zone intersects the south-east corner of the application area. As such, the proposed clearing may impact riparian vegetation and subsequently, on or off-site hydrology and water quality.</p>	May be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>The mapped soils are moderately susceptible to wind and water erosion (GIS Database). Erosion modelling has been conducted by Soilwater Consultants (2021) and concluded that the clay/loam subsoil material is highly susceptible to erosion as well as steeper slope areas. Given this and the extent of the application area, the proposed clearing is likely to have an appreciable impact on land degradation.</p> <p><u>Conclusion:</u></p> <p>The Delegated Officer has determined that the proposed clearing requires further management conditions to compliment the management and mitigations measures outlined by Evolution (Evolution, 2022) in relation to land degradation.</p> <p><u>Condition:</u></p> <p>The following management measures will be required as conditions on the clearing permit:</p> <ul style="list-style-type: none"> no clearing of native vegetation unless mining and associated activities commence within three months of the authorised clearing being undertaken. 	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>There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Drainage lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water flows.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>Given the relatively low depth to groundwater within the application area (10 – 20 metres below ground level) and the naturally high groundwater salinity levels in the region (up to 150, 000 milligrams per litre TDS), the proposed clearing is unlikely to cause deterioration in the quality of underground water.</p> <p>Based on the above coupled with the outlined avoidance and mitigation measures (see section 3.1), the proposed clearing is not likely to cause deterioration in surface or groundwater quality.</p>		
<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 wetlands within the area proposed to clear (GIS Database). Creek lines in the region are dry for most of the year, only flowing following significant rainfall. Given no permanent water courses have been observed within the application area, the proposed clearing is unlikely to contribute to the incidence or intensity of flooding or waterlogging.</p>	Not likely to be at variance	No

Appendix C. Vegetation condition rating scale

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

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from:

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as ‘parkland cleared’ with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D. Sources of information

D.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- 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)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- 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
- Regional Parks (DBCA-026)
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available (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)

D.2. References

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- Botanica Consulting (Botanica) (2010) Level 1 Rubicon/ Hornet Spring Flora Survey. Unpublished report prepared for Barrick-Kanowna Belle September 2010.
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- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DEC (2010) A Biodiversity and Cultural Conservation Strategy for the Great Western Woodlands. Department of Environment and Conservation, Western Australia.
- Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 22 August 2022).
- Department of Primary Industries and Regional Development (DPIRD) (2022) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (Accessed 19 August 2022).
- Department of Water and Environmental Regulation (DWER) (2022) Procedure: Native vegetation clearing permits. Joondalup. Available from: <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. Available from: 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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- Evolution Mining Limited (Evolution) (2022) Application for a Native Vegetation Clearing Permit for Golden Hind, Hornet and Pegasus Projects within Mining Lease M15/669, M15/993, M16//309 and L16/107. Evolution Mining Limited, June 2022.
- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- SoilWater Consultants (2021) Golden Hind Deposit Soil Characterisation. Prepared for Northern Star Resources Limited, February 2021.

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)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>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
RWI 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.