



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

Permit number:	10346/1
Permit type:	Purpose permit
Applicant name:	MARBL Lithium Operations Pty Ltd
Application received:	6 September 2023
Application area:	448.36 hectares
Purpose of clearing:	Mineral production
Method of clearing:	Mechanical removal
Tenure:	General Purpose Leases 45/290, 45/291, 45/321 Mining Leases 45/49, 45/50, 45/254, 45/353, 45/365, 45/381, 45/382, 45/383, 45/887, 45/888, 45/923, 45/924, 45/925, 45/949, 45/950, 45/1188, 45/1252 Miscellaneous Licence 45/443
Location (LGA area/s):	Town of Port Hedland
Colloquial name:	Wodgina Lithium Project

1.2. Description of clearing activities

MARBL Lithium Operations Pty Ltd proposes to clear up to 448.36 hectares of native vegetation within a boundary of approximately 2,214.75 hectares, for the purpose of mineral production. The project is located approximately 78 kilometres south of Port Hedland, within the Town of Port Hedland.

The application is to allow for the expansion of lithium mining operations at the Wodgina Lithium Project.

This application covers CPS 9911/1, which was granted on 21 February 2023 and approved the clearing of 113.8 hectares of native vegetation. This application will consolidate the clearing approved under CPS 9911/1 which will be surrendered following the grant of this application (Mineral Resources, 2023).

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	5 July 2024
Decision area:	448.36 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 Energy, Mines, Industry Regulation and Safety (DEMIRS) on 6 September 2023. DEMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix E), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey, the clearing principles set out in Schedule 5 of the EP Act (Appendix C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3). The Delegated Officer also took into consideration the previous assessment of areas approved under clearing permit CPS 9911/1.

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;
- the loss of native vegetation that is suitable habitat for *Dasyurus hallucatus* (northern quoll), *Macroderma gigas* (ghost bat), and *Rhinonictis aurantia* (Pilbara leaf-nosed bat); and
- impacts to riparian vegetation and watercourses.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that impacts from the proposed clearing can be managed through permit conditions 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:

- restrict the amount of clearing within rocky ridge and gorge habitat to 20.2 hectares;
- restrict the amount of clearing within drainage line habitat to 8.04 hectares;
- avoid, minimise and reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- prevent clearing of Priority flora species *Euphorbia clementii* and *Vigna triodiophila*; or within 10 metres of these species;
- limit clearing of Priority flora species *Terminalia supranitifolia* to 69 individuals;
- limit clearing of Priority flora species *Triodia chichesterensis* to 101,215 individuals; and
- avoid clearing watercourses where practicable, and ensure surface flows are maintained or reinstated downstream.

1.5. Site map

A site map of proposed clearing is provided in Figures 1 and 2 below.

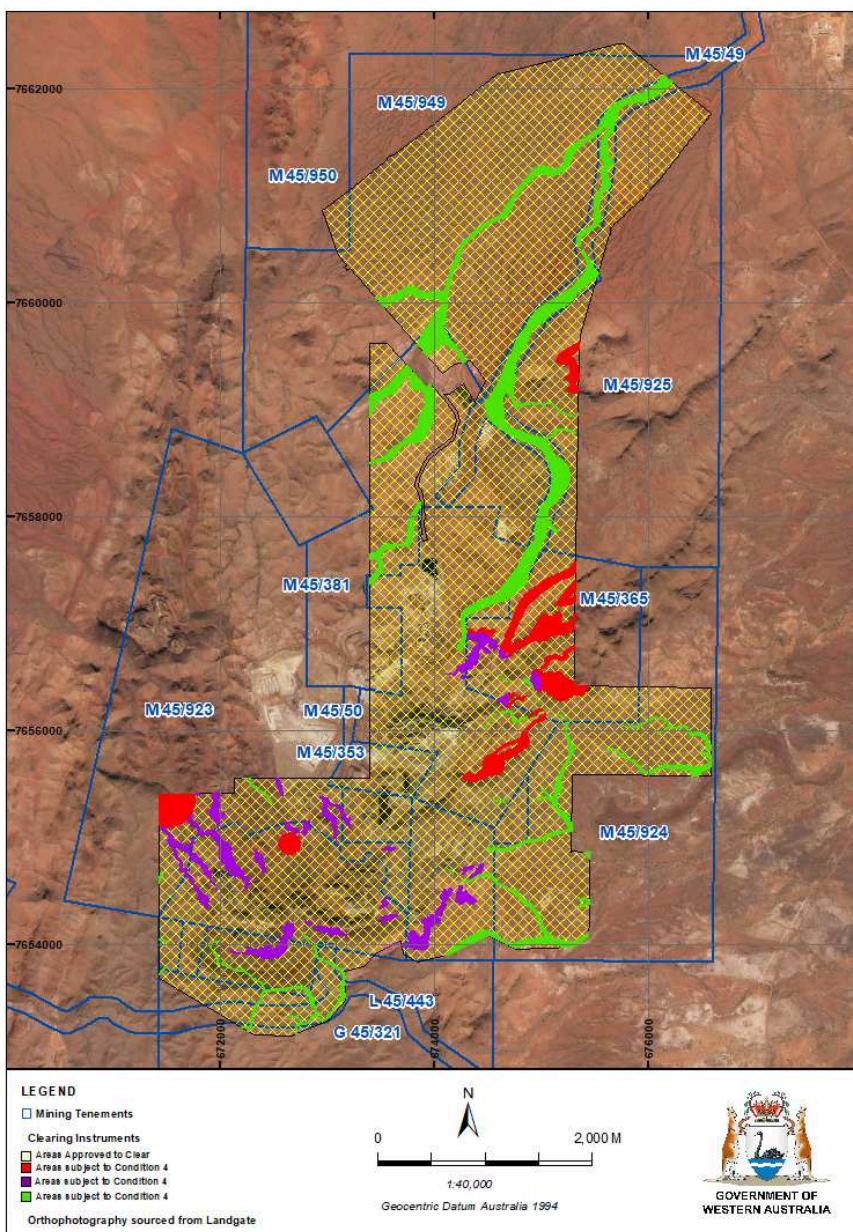


Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit.

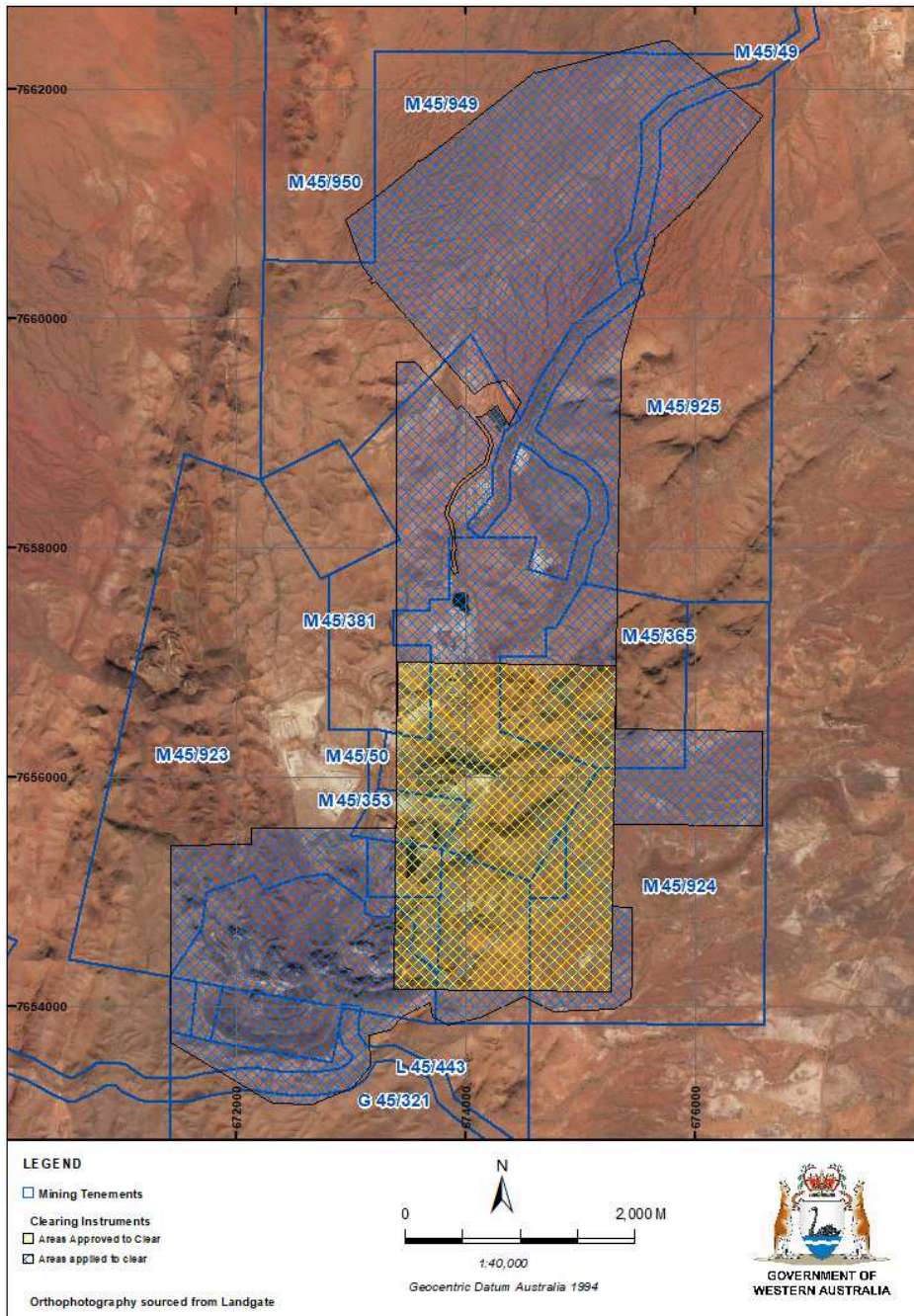


Figure 2. Map of the application area in relation to CPS 9911/1. The yellow area indicates the area approved under CPS 9911/1 and the blue area shows the area applied for CPS 10346/1.

2. Legislative context

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

In addition to the matters considered in accordance with section 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)*
- *Country Areas Water Supply Act 1947 (WA) (CAWS Act)*
- *Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)*
- *Mining Act 1978 (WA)*

Relevant agreements (treatys) considered during the assessment include:

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

The key guidance documents which inform this assessment are:

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

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

The application was originally for the clearing of 637.13 hectares of native vegetation within an area of approximately 2,985.36 hectares. During the assessment the scope of the clearing was reviewed, and the clearing was reduced to 448.36 hectares of native vegetation within a boundary of approximately 2,214.75 hectares.

The project footprint has been revised and reduced to minimise the amount of significant habitat areas such as rocky ridges and gorges, and drainage lines. Significant bat caves will also be avoided with a minimum 100 metre buffer.

The applicant has implemented a land access permit process to ensure that areas to be cleared are clearly demarcated on ground and assessed prior to clearing to ensure that only necessary areas are being cleared (Mineral Resources, 2023). Observers and spotters will be utilised when working near sensitive sites or when boundaries may not be readily visible (Mineral Resources, 2023).

Pre-clearance surveys for fauna will be undertaken within conservation significant species habitat to relocate any species which may be present prior to clearing being undertaken (Mineral Resources, 2023).

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (fauna and flora). The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) - Clearing Principle (a)

Assessment

Numerous flora surveys have been conducted over the greater Wodgina area since 2000 (Umwelt, 2022). There have been six conservation significant flora species recorded within the greater flora survey area; *Euphorbia clementii* (priority 3), *Heliotropium muticum* (priority 3), *Triodia chichesterensis* (priority 3), *Terminalia supranitifolia* (priority 3), *Vigna triodiophila* (priority 3), *Abutilon* aff. *hannii* (potentially undescribed species) (Umwelt, 2022). Within the application area, *Euphorbia clementii*, *Terminalia supranitifolia*, *Triodia chichesterensis* and *Vigna triodiophila* have all been recorded during targeted flora surveys (Mineral Resources, 2023). Whilst there is potential habitat within the application area, the other species which have been previously recorded in the local area were considered unlikely to be present within the application area given they have not been recorded during the intensive sampling undertaken within the application area (Umwelt, 2022). Suitable habitat is also present for the species *Eragrostis crateriformis* (priority 3) and *Gomphrena leptophylla* (priority 3) however, they were also considered unlikely to be present given they have never been recorded from any of the flora surveys in the greater Wodgina area (Umwelt, 2022).

There has been 2,557 individuals of *Terminalia supranitifolia* recorded from 1,100 locations in the greater Wodgina study area (Mineral Resources, 2024; Umwelt, 2022). This species is currently known from 10 broad locations within the Pilbara with the application area near the eastern extent of the species known distribution (DBCA, 2024). Given its location at the edge of the known extent, it may be genetically different from more western localities (DBCA, 2024). Within the application area there are 351 individuals from 215 locations (Mineral Resources, 2023). This represents approximately 14.7% of the individuals recorded in the local area. The proposed disturbance footprint will impact on 69 individuals (Mineral Resources, 2023). Historically there has been 179 individuals cleared so the cumulative impact will increase to 248 individuals (approximately 9.69% of the local population). Based on records close to the proposed disturbance footprint, there may also be indirect impacts to additional plants from sources such as dust and sediment run-off. Within the boundary covered by clearing permit CPS 9911/1, there may be an indirect impact on a further 19 individuals (Umwelt, 2022). There are significant areas of suitable habitat present outside of the application area with the total areas of suitable habitat in the Wodgina area mapped over 1,700 hectares (Umwelt, 2022). There is 407.65 hectares of habitat mapped within the application area with the proposed disturbance footprint impacting on 84.8 hectares of habitat (Mineral Resources, 2023). The assessment of impacts within the boundary of clearing permit CPS CPS 10346/1

9911/1 identified a further 11.65 hectares of habitat within the indirect impact zone. Impacts to this species should be minimised where possible as any additional clearing of individuals has the potential to be regionally significant.

Triodia chichesterensis is a common species in the Wodgina area with an estimated 1,951,574 individuals recorded from 1,928 locations (Umwelt, 2022). Within the application area there are 477,929 individuals from 634 locations which represents 24.48% of the individuals recorded in the local area (Mineral Resources, 2023). The proposed disturbance footprint for project will clear 101,215 individuals which is approximately 5.2% of the total recorded in the Wodgina area. Assessment of indirect impacts within the CPS 9911/1 area identified a further 12,250 individuals which may be impacted and would increase the impact on this species to approximately 5.8% of the local recorded population (Umwelt, 2022). There has been approximately 2,867.2 hectares of preferred habitat mapped for this species over the larger Wodgina survey area (Mineral Resources, 2023). Within the permit area there is 824.54 hectares of this preferred habitat with the proposed disturbance footprint impacting on 190.7 hectares and a further 15.92 hectares of habitat with the indirect impact zone (Mineral Resources, 2023; Umwelt, 2022). Whilst this species is common in the local area, continued increases to cumulative impacts may start to be significant to this subpopulation. Where possible impacts to this species should be avoided.

Euphorbia clementii has been recorded at 322 locations in the greater Wodgina area with a total of 61,529 counted (Umwelt, 2022). Within the application area there are 40 individuals of this species recorded at six locations (Mineral Resources, 2023). The potential removal of 40 plants is not likely to have a significant impact on the local population of these species. The proposed disturbance footprint has been designed so it will not clear any of these locations. It is unlikely that there will be any further loss of individuals from indirect impacts (Umwelt, 2022).

Vigna triodiophila was recorded at 24 locations within the application area, with 481 individuals record (Mineral Resources, 2023). There have been 2,480 individuals recorded in the greater Wodgina area (Mineral Resources, 2023). The proposed disturbance footprint will not impact on any individuals of this species (Mineral Resources, 2023). There is approximately 563.96 hectares of habitat mapped within the application area, of which 20.12 hectares is within the proposed disturbance footprint (Mineral Resources, 2023).

There is one record of *Goodenia obscurata* (Priority 3) within the application area (DBCA, 2024). This species has only been recently described and therefore was not searched for during any of the flora surveys undertaken over the area (Mineral Resources, 2024). This species is a short lived perennial known from 24 herbarium species scattered across the Carnarvon and Pilbara bioregions (DBCA, 2024). This species occurs on floodplains or low rocky ridges, growing in red-brown sandy clay or lateritic loam over banded ironstone (Western Australian Herbarium, 1998-). Suitable habitat for this species is common in the local area (Umwelt, 2022).

The proposed clearing will increase the fragmentation of the known extent of the subpopulation for *Terminalia supranitifolia* and *Triodia chichesterensis* by separating existing subpopulations (Umwelt, 2022). Cumulative impacts to these species are increasing and may begin to be significant if further increases occur. The impact to *Triodia chichesterensis* is not likely to be significant due to the close proximity of the remaining subpopulations and the likely further extent of populations within the application area (Umwelt, 2022). A subpopulation of *Terminalia supranitifolia* will be created by the proposed clearing however, it is not likely to impact the long term reproductive viability of this population given the known locations to north and south outside of the application area (Umwelt, 2022).

Conclusion

Based on the above assessment, the proposed clearing will result in local impacts to priority flora species. The proposed clearing will further increase fragmentation of the populations however, these species are well represented locally outside of the application area. Provided that the numbers of individuals and habitat impacted is restricted to the amounts identified, the proposed clearing is not expected to have a significant impact on the long term viability of the local populations.

Conditions

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

- prevent clearing of Priority flora species *Euphorbia clementii* and *Vigna triodiophila*; or within 10 metres of these species;
- limit clearing of Priority flora species *Terminalia supranitifolia* to 69 individuals; and
- limit clearing of Priority flora species *Triodia chichesterensis* to 101,215 individuals.

3.2.2. Biological values (fauna) - Clearing Principle (b)

Assessment

There have been several fauna surveys undertaken over the greater Wodgina area which include the application area. There have been six broad fauna habitats mapped within the application area (Mineral Resources, 2023):

- Ironstone ridgetop;
- Rocky ridge and gorge;
- Rocky foothills;
- Stony rise;
- Spinifex stony plain; and
- Drainage line.

There is also a large proportion of the application area which has been mapped as previously cleared (approximately 19%). Of the area covered by fauna habitats, the majority of the area is mapped as rocky foothills and spinifex stony plain (Mineral Resources, 2023). Most of the habitats are widespread throughout the bioregion however, the ironstone ridgetop and rocky ridge and gorge habitats are less common and restricted. The rocky ridge and gorge habitat is considered to be a significant habitat due to its limited extent and potential to support threatened fauna species (Umwelt, 2022). The drainage line habitat is also considered to have elevated significance because of its ability to support diverse faunal assemblages and act as corridors for

movement (Umwelt, 2022). Given the range of habitats present, the fauna assemblage of the greater Wodgina survey area has a diverse faunal assemblage (Umwelt, 2022).

The following conservation significant fauna species (state listing shown below) have been identified as potentially occurring within the application area:

- Black-striped Ctenotus (*Ctenotus nigrilineatus*) (Priority 1)
- Common Sandpiper (*Tringa hypoleucos*) (Migratory)
- Fork-tailed Swift (*Apus pacificus*) (Migratory)
- Gane's Blind Snake (*Anilius ganei*) (Priority 1)
- Ghost Bat (*Macroderma gigas*) (Vulnerable)
- Greater Bilby (*Macrotis lagotis*) (Vulnerable)
- Grey Falcon (*Falco hypoleucos*) (Vulnerable)
- Lakeland Downs Mouse (*Leggadina lakedownensis*) (Priority 4)
- Long-tailed Dunnart (*Sminthopsis longicaudata*) (Priority 4)
- Northern Quoll (*Dasyurus hallucatus*) (Endangered)
- Oriental Plover (*Charadrius veredus*) (Migratory)
- Peregrine Falcon (*Falco peregrinus*) (Other specially protected fauna)
- Pilbara Leaf-nosed Bat (*Rhinonictis auratia*) (Vulnerable)
- Pilbara Olive Python (*Liasis olivaceous barroni*) (Vulnerable)
- Spectacled Hare-wallaby (mainland) (*Lagorchestes conspicillatus leichardti*) (Priority 4)
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (Priority 4)
- Wood Sandpiper (*Tringa glareola*) (Migratory)

The Northern Quoll has been regularly recorded within the application area (Western Wildlife, 2020). The population at Wodgina is likely to be a high density breeding population with the annual population fluctuating based on rainfall, food availability, and fire (Umwelt, 2022). The population is likely to extend throughout the rocky range surrounding the application area. The rocky ridge and gorge habitat has been identified as critical habitat for this species due to its importance for shelter and breeding (Umwelt, 2022). Reducing the amount of this habitat is likely to result in a long-term decrease in the carrying capacity of the local population (Umwelt, 2022). There was 85.29 hectares of this habitat mapped within the application area, of which 20.2 hectares is proposed to be cleared as part of the project. There have been 447.99 hectares of this habitat mapped in the greater Wodgina survey area (Mineral Resources, 2023). Including the proposed clearing of 20.2 hectares, the cumulative impact of all clearing at Wodgina since 2009 will be 67.19 hectares which is approximately 15% of the habitat (Mineral Resources, 2023). All habitat within one kilometre of the rocky ridge and gorge habitat was considered to be foraging and dispersal habitat (Umwelt, 2022). Therefore, the majority of the vegetation within the proposed disturbance footprint is considered either breeding habitat or foraging and dispersal habitat for the Northern Quoll (Umwelt, 2022). There are areas of rocky ridge and gorge habitat that are not proposed to be cleared which contain known caves that will be retained and may still be used as potential breeding sites. The retention of just these caves have the potential to limit dispersal throughout the landscape and create islands of habitats which can increase the cumulative impact on the short to medium term (DBCA, 2024). Clearing of watercourses which are utilised as dispersal paths has been minimised and areas other than mining voids will be rehabilitated following mining to allow for future use by fauna species (Mineral Resources, 2024).

The Pilbara leaf-nosed bat has been recorded within the permit area (Umwelt, 2022). There have been five nocturnal refuges recorded within the permit area (Mineral Resources, 2023). Nocturnal refuges are considered to be important for the persistence of the local population, however, are not considered to be habitat critical to the survival of the species (Threatened Species Scientific Committee, 2016). There is also an identified transitional diurnal roost located at Wodgina, however, this is not within the clearing permit boundary (Mineral Resources, 2023). All of the nocturnal refuges within the permit area are outside of the proposed disturbance footprint and all but one are within an exclusion zone proposed by the applicant and will not be impacted by the proposed clearing (Mineral Resources, 2023). The nocturnal refuge not within an exclusion area is located adjacent to a previously active tailings storage facility (TSF). Rehabilitation works to cap the TSF may need to be undertaken within close proximity of the refuge. Works will be undertaken during daylight to minimise any potential disturbance to any bats which may be utilising the cave. Foraging habitat is also likely to be present, with the drainage line and rocky ridge and gorge habitats the most significant for foraging (Umwelt, 2022).

There are records of Ghost Bats across the greater Wodgina area, and they are likely to utilise a number of caves in the area (Umwelt, 2022). There are a number of caves with previous Ghost Bat records, including several diurnal roosts and diurnal roosts that are potential maternity roosts (Umwelt, 2022). Within the permit area there are two known diurnal roosts, a potential maternity roost and ten nocturnal refuges (Mineral Resources, 2023). Diurnal roosts are critical habitat for the long term survival of Ghost Bats and a 100 metre exclusion area surrounding these caves has been proposed by MARBL Lithium Operations Pty Ltd (2022) based on it being an isolated roost assessed as critical (Bat Call WA, 2021). A 250 metre buffer is proposed around the potential maternity roost to ensure that it is not impacted by the proposed clearing. It is likely that several of the nocturnal refuges will be impacted by the proposed clearing. There are numerous other nocturnal roosts which have been identified within similar habitat in the greater Wodgina area (Umwelt, 2022). Whilst they are used by the Ghost Bats whilst foraging, they are not considered critical for the species (Bat Call WA, 2021). Similar to the Pilbara Leaf-nosed Bat, the drainage line and rocky ridge and gorge habitats are likely to be significant as foraging habitat given the potential presence of water and higher densities of prey.

The Pilbara Olive Python has not been previously recorded within the permit area (Mineral Resources, 2023). It is known to occur in other rocky ranges in the region and is considered likely to occur within habitat in the permit area (Umwelt, 2022). This species is strongly associated with rocky habitats, particularly areas with permanent or semi-permanent water. The rocky ridge and gorge habitat is considered to be critical habitat for this species with the drainage line habitat also considered to be important for dispersal and foraging (Umwelt, 2022). There are no semi-permanent or permanent water sources within the permit area.

The rocky ridge and gorge, and drainage line habitats are significant for these four species. The proposed clearing has been reduced to minimise impacts on these significant habitats. The proposed activities will result in the removal of 20.2 hectares of the rocky ridge and gorge habitat and 8.04 hectares of drainage line habitat (Mineral Resources, 2023). As this application includes areas already covered by CPS 9911/1, this represents an increase in clearing of 11.99 hectares of rocky ridge and gorge habitat and 4.94 hectares of drainage line habitat (taking into account areas already cleared) (Mineral Resources, 2023). An exclusion zone consisting of all the rocky ridge and gorge habitat outside of the proposed disturbance envelope and 100 metres around the Ghost Bat diurnal roosts has been proposed by the applicant. A 250 metre buffer around the potential maternity roosts has also been implemented. These habitats are also represented outside the permit area with over 300 hectares of both these habitats mapped in the greater Wodgina area (Umwelt, 2022). Provided the impacts to these habitats are kept to a minimum, the proposed clearing is not likely to severely impact on the local populations of these species.

The Gane's Blind Snake has not been recorded in the local area however, it is also likely to utilise the rocky ridge and gorge habitat if present, so any reduction of impact on this habitat will also benefit this species (Umwelt, 2022). The other conservation significant species potentially within the permit area are either vagrant species which would only occasionally utilise the permit area or found within the more common habitats which are well represented outside of the permit area.

Conclusion

Based on the above assessment, the proposed clearing will impact on habitat which is significant for local fauna species. The loss of this habitat will have a permanent impact on the local populations of some conservation significant fauna. Efforts have been made to reduce the amount of habitat that will be removed, and provided disturbance is kept to a minimum, the loss of this habitat is not expected to impact on the long term viability of these local populations.

Conditions

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

- avoid clearing areas of habitat identified within an exclusion area;
- restrict the amount of clearing within rocky ridge and gorge habitat to 20.2 hectares;
- restrict the amount of clearing within drainage line habitat to 8.04 hectares; and
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.

3.3. Relevant planning instruments and other matters

The clearing permit application was advertised on 4 January 2024 by the Department of Energy, Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim 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 three 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.

It is noted that the proposed clearing may impact on Northern Quoll, Pilbara Leaf-nosed Bat, Ghost Bat and Pilbara Olive Python which are a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the project to the (Federal) Department of Climate Change, Environment and Water for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of Climate Change, Energy, the Environment and Water and the Environment for further information regarding notification and referral responsibilities under the EPBC Act.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.
- 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
Amendment of the application to reduce the permit boundary and amount of clearing.	Avoidance and minimisation measures were considered in making a decision for this application.

Appendix B. Site characteristics

B.1. Site characteristics

Characteristic	Details
Local context	<p>The project is located approximately 78 kilometres south of Port Hedland (GIS Database). Part of the application area has been previously disturbed from mining activities.</p> <p>The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. The application area includes existing disturbance from the existing Wodgina mine. The areas surrounding the application area consists of intact vegetation (GIS Database).</p>
Ecological linkage	According to available databases, the application area does not contain any known or mapped ecological linkages (GIS Database).
Conservation areas	The nearest conservation area is the Mungaroo Range Nature Reserve which is located approximately 50 kilometres southwest 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> <p>93: Hummock grasslands, shrub steppe; kanji over soft spinifex; and 626: Hummock grasslands, shrub-steppe, kanji over soft spinifex and <i>Triodia brizoides</i> (GIS Database).</p> <p>Over 99 per cent of the pre-European extents of vegetation associations 93 and 626 remain at both a state and bioregion level (Government of Western Australia, 2019).</p> <p>Flora and vegetation surveys were conducted over the application area by Woodman Environmental (2020) over several survey periods. Surveys included a detailed flora and vegetation survey from 26 June to 3 July 2018, a targeted significant flora survey from 3 to 9 April 2019, and a detailed flora and vegetation survey with a targeted significant flora survey from 17 to 25 June 2019. The survey describes 15 different vegetation units within the survey area, 14 of which were recorded within the application area. The following vegetation units were recorded within the application area (Mineral Resources, 2023):</p> <ul style="list-style-type: none"> • 1: Tall open to sparse shrubland dominated by <i>Acacia orthocarpa</i>, <i>A. ancistrocarpa</i> and occasionally <i>A. acradenia</i> over low sparse shrubland of mixed species dominated by <i>A. stellaticeps</i> over low hummock grassland dominated by <i>Triodia lanigera</i> and occasionally <i>T. epactia</i> on red-brown clay loam with granite, quartz or ironstone stones on colluvial stone plains and low flat-topped rises. • 2: Tall to mid sparse shrubland of mixed species dominated by <i>Acacia acradenia</i>, <i>A. inaequilatera</i>, <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> and occasionally <i>A. tumida</i> var. <i>pilbarensis</i> and <i>A. ancistrocarpa</i> over low sparse shrubland of mixed species including <i>Indigofera monophylla</i> and <i>Goodenia stobbsiana</i> over low hummock grassland dominated by <i>Triodia epactia</i> and/or <i>T. brizoides</i> on red, brown or red-brown clay loam with metamorphic, ironstone, quartz and occasionally granite stones, occasionally with metamorphosed granite or granite outcropping, on lower slopes and colluvial outwashes of ranges and occasionally on low flat-topped rises. • 3: Low open woodland to isolated trees of <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> and/or <i>Corymbia hamersleyana</i> over tall to mid sparse to open shrubland dominated by <i>Acacia acradenia</i>, <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> and <i>A. tumida</i> var. <i>pilbarensis</i> over low sparse shrubland of mixed species including <i>Dampiera candidans</i>, <i>Indigofera monophylla</i>, <i>Goodenia stobbsiana</i> and <i>Triumfetta maconochieana</i> over low hummock grassland dominated by <i>Triodia epactia</i> and often <i>T. brizoides</i> or <i>T. wiseana</i> over low sparse tussock grassland dominated by <i>Eriachne mucronata</i> on red, brown or red brown clay loam with ironstone or metamorphosed granite stones over ironstone or metamorphosed granite outcropping on plateaus, crests and upper slopes of range. • 4: Tall to mid sparse shrubland dominated by <i>Acacia inaequilatera</i>, <i>A. acradenia</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> over low sparse shrubland of mixed species including <i>Corchorus parviflorus</i> and <i>Indigofera monophylla</i> over low hummock

Characteristic	Details
	<p>grassland dominated by <i>Triodia epactia</i> and/or <i>T. wiseana</i> , or occasionally <i>T. brizoides</i> and <i>T. chichesterensis</i>, on red, brown or red-brown clay loam with metamorphosed granite, dolerite and occasionally ironstone stones over metamorphosed granite or dolerite outcropping on mid and upper slopes of ranges, and low ridges and hills.</p> <ul style="list-style-type: none"> • 5: Tall to mid sparse shrubland of mixed species dominated by <i>Acacia acradenia</i>, <i>A. inaequilatera</i> and <i>A. orthocarpa</i> over low sparse shrubland of mixed species dominated by <i>Acacia spondylophylla</i> over low hummock grassland dominated by a combination of <i>Triodia chichesterensis</i>, <i>T. wiseana</i>, <i>T. epactia</i> , <i>T. brizoides</i> and <i>T. lanigera</i> on red-brown clay loam with metamorphosed granite, ironstone, dolerite, quartz and calcrete stones, occasionally over metamorphosed granite and dolerite outcropping, on lower slopes and colluvial outwashes of ranges and low flat-topped rises. • 6: Low open woodland to isolated trees of <i>Corymbia hamersleyana</i> over tall to mid sparse shrubland dominated by <i>Acacia inaequilatera</i>, <i>A. acradenia</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> over low hummock grassland dominated by <i>Triodia chichesterensis</i> and/or <i>T. wiseana</i> on brown or occasionally red clay loam with calcrete, quartz and metamorphosed granite stones, in places over calcrete outcropping, on colluvial outwashes of ranges and colluvial stony plains. • 7: Tall to mid sparse shrubland of mixed species including <i>Acacia inaequilatera</i>, <i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i> and <i>A. orthocarpa</i> over low hummock grassland dominated by <i>Triodia chichesterensis</i> and/or <i>T. wiseana</i> on brown, red or red-brown clay loam with dolerite, calcrete and quartz stones, often with dolerite outcropping, on low hills. • 8: Low isolated trees of <i>Corymbia hamersleyana</i> over tall to mid sparse shrubland dominated by <i>Acacia bivenosa</i> and <i>A. inaequilatera</i> over low hummock grassland dominated by <i>Triodia chichesterensis</i> and/or <i>T. wiseana</i> and <i>T. angusta</i> on brown, red-brown or grey-brown clay loam with dolerite, calcrete, ironstone and quartz stones on colluvial stony plains. • 9: Low isolated trees of <i>Corymbia hamersleyana</i> over mid sparse shrubland to isolated shrubs dominated by <i>Acacia acradenia</i>, <i>A. inaequilatera</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> over low hummock grassland dominated by <i>T. wiseana</i>, <i>T. epactia</i> and occasionally <i>T. brizoides</i> on red, brown or red-brown clay loam with ironstone, metamorphosed granite or occasionally dolerite or quartz stones over ironstone or metamorphosed granite outcropping on cliffs, ridges and crests and upper to mid slopes of ranges. • 10: Low isolated trees of <i>Corymbia hamersleyana</i> and/or <i>Corymbia zygophylla</i> over tall to mid open to sparse shrubland dominated by <i>Acacia ancistrocarpa</i> and sporadically <i>A. tumida</i> var. <i>pilbarensis</i>, <i>A. inaequilatera</i> and <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> over low sparse shrubland of mixed species dominated by <i>Bonamia erecta</i>, <i>Indigofera monophylla</i> and <i>Ptilotus astrolasius</i> over low hummock grassland dominated by <i>Triodia lanigera</i> and sporadically <i>T. schinzii</i> and/or <i>T. epactia</i> on red, brown or red-brown sandy or clay loam, often with quartz or ironstone stones, on plains. • 11: Low isolated trees of <i>Corymbia hamersleyana</i> over tall open to sparse shrubland dominated by <i>A. tumida</i> var. <i>pilbarensis</i>, <i>A. ancistrocarpa</i> and <i>A. acradenia</i> over low open to sparse shrubland of mixed species including <i>Bonamia erecta</i>, <i>Isotropis atropurpurea</i> and <i>Corchorus parviflorus</i> over low hummock and tussock grassland dominated by <i>Chrysopogon fallax</i>, <i>Triodia epactia</i> and occasionally <i>T. lanigera</i> on red, brown or red-brown sandy or clay loam with colluvial stones in minor drainage features including flats and small creeks. • 12: Low open woodland of <i>Corymbia hamersleyana</i> over tall sparse shrubland dominated by <i>Acacia inaequilatera</i> over mid sparse shrubland dominated by <i>Acacia bivenosa</i> and <i>Codonocarpus cotinifolius</i> over low sparse shrubland of mixed species dominated by <i>Corchorus parviflorus</i>, <i>Indigofera monophylla</i>, <i>Heliotropium chrysocarpum</i> and <i>Heliotropium pachyphyllum</i> over low hummock grassland dominated by <i>Triodia chichesterensis</i> and occasionally <i>T. epactia</i> or <i>T. angusta</i> on red, brown or grey-brown clay loam with calcrete or quartz stones on undulating plains. • 13: Isolated low trees dominated by <i>Corymbia hamersleyana</i> over tall to mid sparse shrubland dominated by <i>Acacia orthocarpa</i>, <i>Grevillea wickhamii</i> subsp. <i>hispidula</i> and commonly <i>A. maitlandii</i> and <i>A. tumida</i> var. <i>pilbarensis</i> over low sparse shrubland of mixed species including <i>Corchorus parviflorus</i>, <i>Dampiera candidans</i>, <i>Goodenia stobbsiana</i>, <i>Indigofera monophylla</i> and <i>Scaevola browniana</i> subsp. <i>browniana</i> over low hummock grassland dominated by <i>Triodia epactia</i> and sporadically <i>T. brizoides</i> or <i>T. lanigera</i> on orange, brown or redbrown sandy or clay loam with granite and quartz stones over granite outcropping on undulating plains or low rises. • 14: Low open woodland to isolated trees dominated by <i>Eucalyptus victrix</i> and/or <i>Corymbia hamersleyana</i> over tall open to sparse shrubland of mixed species dominated by <i>Acacia pyrifolia</i> var. <i>pyrifolia</i>, <i>A. tumida</i> var. <i>pilbarensis</i> and <i>Melaleuca linophylla</i> over mid to low open to sparse shrubland of mixed species including <i>Cajanus pubescens</i>, <i>Indigofera monophylla</i>, <i>Tephrosia rosea</i> var. <i>clementii</i>, <i>Corchorus parviflorus</i> and <i>Jasminum didymum</i> subsp. <i>lineare</i> over low tussock and hummock grassland to open tussock and hummock grassland of mixed species dominated by <i>Triodia epactia</i>, <i>Cenchrus ciliaris</i>, <i>Chrysopogon fallax</i>, <i>Cymbopogon ambiguus</i> and

Characteristic	Details
	<i>Eriachne tenuiculmis</i> on red or brown clay or sandy loam, usually with colluvial stones, in major creeks.
Vegetation condition	The vegetation survey (Woodman Environmental, 2020) indicates the vegetation within the proposed clearing area is in excellent to completely degraded (Trudgen, 1991) condition, with the majority classified as excellent. The full Trudgen (1991) condition rating scale is provided in Appendix D.
Climate and landform	The application area is mapped at an elevation of approximately 150 to 330 metres Australian Height Datum (GIS Database). Average annual rainfall at the nearest weather station (Marble Bar) is approximately 379 millimetres (BoM, 2024).
Soil description	The soils of the application area are broadly mapped as the following (DPIRD, 2024): <ul style="list-style-type: none"> • Boolgeeda system (280Bg): Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands • Capricorn system (280Cp): Rugged sandstone hills, ridges, stony foot slopes and interfluves supporting low acacia shrub lands or hard spinifex grasslands with scattered shrubs; • Platform system (280PI): Dissected slopes and raised plains supporting shrubby hard spinifex grasslands. • Rocklea system (280Rk): Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.
Land degradation risk	The land and soil systems of the application area are not considered prone to erosion (GIS Database).
Waterbodies	Several minor, non-perennial watercourses are mapped within the application area, particularly in the north of the application area (GIS Database). Several semi-permanent pools were identified within the flora survey area, however none were found inside the application area (Mineral Resources, 2023).
Hydrogeography	The application area is not mapped within any Public Drinking Water Source Areas (GIS Database). The mapped groundwater salinity is 500 to 1,000 milligrams per litre total dissolved solids which is described as marginal (GIS Database).
Flora	Four conservation significant flora species have been recorded within the application area: <ul style="list-style-type: none"> • <i>Euphorbia clementii</i> (Priority 3) • <i>Terminalia supranitifolia</i> (Priority 3) • <i>Triodia chichesterensis</i> (Priority 3) • <i>Vigna triodiophila</i> A.E.Holland & R.Butcher (Priority 3) <p>A further three species have been recorded within the wider flora survey area, but not within the application area:</p> <ul style="list-style-type: none"> • <i>Abutilon</i> aff. <i>Hannii</i> (potentially undescribed) • <i>Euploca mutica</i> Domin (Priority 3) (previously known as <i>Heliotropium muticum</i>) <p>A search of available databases indicates an additional 15 conservation significant flora species have been recorded within 50 kilometres of the application area:</p> <ul style="list-style-type: none"> • <i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095) (Priority 3) • <i>Acacia leeuweniana</i> (Priority 1) • <i>Acacia levata</i> (Priority 3) • <i>Bulbostylis burbidgeae</i> (Priority 4) • <i>Eragrostis crateriformis</i> (Priority 3) • <i>Gomphrena leptophylla</i> (Priority 3) • <i>Gymnanthera cunninghamii</i> (Priority 3) • <i>Nicotiana umbratica</i> (Priority 3) • <i>Phyllanthus hebecarpus</i> (Priority 3) • <i>Ptilotus mollis</i> (Priority 4) • <i>Quoya zonalis</i> (Endangered) • <i>Rothia indica</i> subsp. <i>australis</i> (Priority 3) • <i>Stylidium weeliwollii</i> (Priority 3) • <i>Themeda</i> sp. <i>Panorama</i> (J. Nelson et al. NS 102) (Priority 1)

Characteristic	Details
	<ul style="list-style-type: none"> <i>Triodia basitricha</i> (Priority 3)
Ecological communities	No Threatened or Priority ecological communities have been recorded within the application area (GIS Database). The nearest recorded Priority Ecological Community is located approximately 10 kilometres from the application area (GIS Database).
Fauna	<p>Four conservation significant fauna species have been recorded within the application area:</p> <ul style="list-style-type: none"> <i>Dasyurus hallucatus</i> (northern quoll) (Endangered) <i>Macroderma gigas</i> (ghost bat) (Vulnerable) <i>Rhinionictis aurantia</i> (Pilbara leaf-nosed bat) (Vulnerable) <i>Pseudomys chapmani</i> (western pebble-mound mouse) (Priority 4) <p>A further three species have been recorded within the wider fauna survey area, but not within the application area:</p> <ul style="list-style-type: none"> <i>Lagorchestes conspicillatus leichhardti</i> (spectacled hare-wallaby (mainland)) (Priority 4) <i>Sminthopsis longicaudata</i> (long-tailed dunnart) (Priority 4) <p>A search of available databases indicates several other conservation significant fauna species have been recorded within 50 kilometres of the application area (GIS Database).</p>
Fauna habitat	<p>The following fauna habitats have been identified within the application area (Mineral Resources, 2023):</p> <ul style="list-style-type: none"> Drainage line Ironstone ridge top Rocky foothills Rocky ridge and gorge Spinifex stony plain Stony rises Rehabilitated areas Disturbed areas

B.2. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix E.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
<i>Abutilon</i> aff. <i>Hannii</i>	Potentially undescribed	Y	Y	<5	Y
<i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095)	P3			<35	Y
<i>Acacia leeuweniana</i>	P1	N	N	<15	Y
<i>Acacia levata</i>	P3	N	N	<20	Y
<i>Bulbostylis burbidgeae</i>	P4	Y	Y	<10	Y
<i>Eragrostis crateriformis</i>	P3	Y	Y	<20	Y
<i>Euphorbia clementii</i>	P3	Y	Y	0	Y
<i>Euploca mutica</i>	P3	Y	Y	<5	Y
<i>Gomphrena leptophylla</i>	P3	Y	Y	<10	Y
<i>Gymnanthera cunninghamii</i>	P3	Y	Y	<5	Y
<i>Nicotiana umbratica</i>	P3	N	N	<5	Y
<i>Phyllanthus hebecarpus</i>	P3	N	N	<15	Y
<i>Ptilotus mollis</i>	P4			<40	Y
<i>Quoya zonalis</i>	EN	Y	Y	>20	Y

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable soil type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
<i>Rothia indica</i> subsp. <i>australis</i>	P3			<25	Y
<i>Stylidium weeliwoffi</i>	P3	N	N	<15	Y
<i>Themeda</i> sp. Panorama (J. Nelson et al. NS 102)	P1			<40	Y
<i>Terminalia supranitifolia</i>	P3	Y	Y	0	Y
<i>Triodia basitricha</i>	P3			<45	Y
<i>Triodia chichesterensis</i>	P3	Y	Y	0	Y
<i>Vigna triodiophila</i> A.E.Holland & R.Butcher	P3	Y	Y	<5	Y

B.3. Fauna analysis table

Species name	Conservation status (WA)	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Are surveys adequate to identify? [Y, N, N/A]
<i>Actitis hypoleucos</i> (common sandpiper)	MI	N	N	<20	Y
<i>Anilius ganei</i> (Gane's blind snake (Pilbara))	P1	Y	Y	>20	Y
<i>Apus pacificus</i> (fork-tailed swift)	MI	Y	Y	<10	Y
<i>Ctenotus nigrilineatus</i> (pin-striped finenout Ctenotus)	P1	Y	Y	>20	Y
<i>Dasyercus blythi</i> (brush-tailed mulgara)	P4	N	N	<20	Y
<i>Dasyurus hallucatus</i> (northern quoll)	EN	Y	Y	0	Y
<i>Falco hypoleucos</i> (grey falcon)	VU	Y	Y	<5	Y
<i>Falco peregrinus</i> (peregrine falcon)	OS	Y	Y	<5	Y
<i>Fregata ariel</i> (lesser frigatebird)	MI	N	N		Y
<i>Hipposideros stenotis</i> (northern leaf-nosed bat)	P2	Y	Y	<5	Y
<i>Lagorchestes conspicillatus leichardti</i> (spectacled hare-wallaby (mainland))	P4	Y	Y	<5	Y
<i>Leggadina lakedownensis</i> (northern short-tailed mouse, Lakeland Downs mouse, kerakenga)	P4	Y	Y	>20	Y
<i>Liasis olivaceus barroni</i> (Pilbara olive python)	VU	Y	Y	<15	Y
<i>Macroderma gigas</i> (ghost bat)	VU	Y	Y	0	Y
<i>Macrotis lagotis</i> (bilby, dalgyte, ninu)	VU	N	N	<10	Y
<i>Pseudomys chapmani</i> (western pebble-mound mouse, ngadji)	P4	Y	Y	0	Y
<i>Rhinonictes aurantia</i> (Pilbara) (Pilbara leaf-nosed bat)	VU	Y	Y	0	Y
<i>Sminthopsis longicaudata</i> (long-tailed dunnart)	P4	Y	Y	<5	Y

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains records of four Priority flora species (Mineral Resources, 2023). The permit area also contains a diversity of fauna habitats and supports several conservation significant species of fauna including northern quoll, ghost bat and Pilbara leaf-nosed bat.</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared contains significant habitat for conservation significant fauna species, including <i>Dasyurus hallucatus</i> (northern quoll), <i>Macroderma gigas</i> (ghost bat), and <i>Rhinonictoris aurantia</i> (Pilbara leaf-nosed bat) (MARBL Lithium Pty Ltd, 2022).</p>	At variance	Yes Refer to Section 3.2.2, above.
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared does not contain records of any Threatened flora species listed under the BC Act (Mineral Resources, 2023; GIS Database).</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The proposed clearing area does not contain species representative of a Threatened Ecological Community listed under the BC Act or EPBC Act.</p>	Not likely to be at variance	No
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 national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30% of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The extent of the mapped vegetation type is over 99% at both a state and bioregional level. 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 will not have an impact on the environmental values of any 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>Given several minor, non-perennial watercourses or wetlands are recorded within the application area, the proposed clearing will impact on vegetation associated with a watercourse (GIS Database). Several watercourses have already been impacted to an extent by the existing mining activities. The clearing for the expansion associated with this clearing permit should not cause complete deterioration of the flow of water along these watercourses. Potential impacts on watercourses in the area may be minimised</p>	At variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
by the implementation of a watercourse management condition requiring the maintenance of existing water flows.		
<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 and land systems are generally not susceptible to erosion (van Vreeswyk, et al., 2004; GIS Database). The proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to 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). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed clearing is unlikely to result in significant changes to surface water quality.</p> <p>The groundwater within the application area is between 500 to 1,000 milligrams per litre of Total Dissolved Solids (GIS Database). This is considered to be marginal water. It would not be expected that the proposed clearing would cause salinity levels within the application or surrounding area to alter.</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 several non-perennial watercourses within the application area and no permanent waterbodies (GIS Database). 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.</p>	Not likely to be at variance	No

Appendix D. Vegetation condition rating scale

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

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

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.

Condition	Description
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Appendix E. Sources of information

E.1. GIS databases

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

- 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)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- 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 Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- 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)

E.2. References

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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:

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.