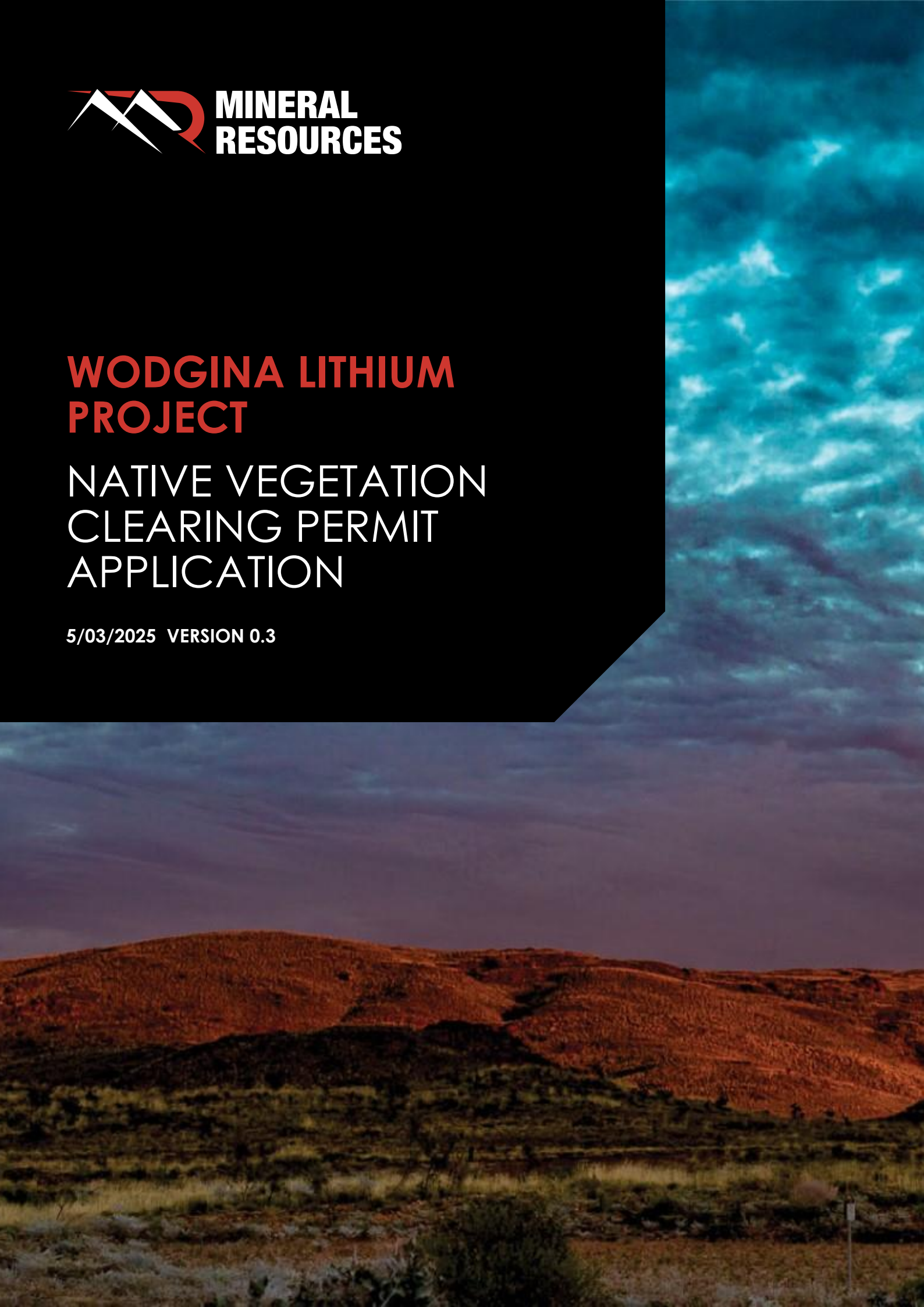
MINERAL RESOURCES

WODGINA LITHIUM PROJECT

NATIVE VEGETATION CLEARING PERMIT APPLICATION

5/03/2025 VERSION 0.3



DOCUMENT INFORMATION

Supporting document to *NV-F01 Application for new permit or referral to clear native vegetation (v14, February 2023)*.

Contact

Jenny Cookson
Senior Manager - Approvals
Strategy and Growth
E jenny.cookson@mrl.com.au
P 0407 282 596

20 Walters Drive
Osborne Park WA 6017

POSTAL ADDRESS
Locked Bag 13, Osborne Park DC, WA 6916

Revision History					
Version	**Issue Date**	**Prepared by**	**Reviewed By**	**Approved By**	**Document Purpose**
0.1	05/03/2025	D. Hodges C. Stevenson	A. Trolove A. Cross	J. Cookson	Submission to DEMIRS to amend CPS 10346/1.
0.2	06/06/2025	D. Hodges	D. Carter	J. Cookson	Revised as new permit application.
0.3	12/06/2025	D. Hodges	D. Carter	J. Cookson	Minor revision following validation.

Acknowledgement of Country

MinRes is committed to reconciliation and recognises and respects the significance of Aboriginal and Torres Strait Islander peoples' communities, cultures, and histories. MinRes acknowledges and respects Aboriginal and Torres Strait Islander peoples as the traditional custodians of the land.

EXECUTIVE SUMMARY

The Wodgina Lithium Project ("Wodgina" or the "Project") is a mining operation located approximately 110 kilometres (km) south of Port Hedland in the Pilbara Region, Western Australia. The Project is operated by MARBL Lithium Operations Pty Ltd (MARBL), a joint venture between Mineral Resources Limited (MinRes) and the Albemarle Corporation (Albemarle).

MARBL is applying for a new Native Vegetation Clearing Permit (NVCP) Purpose Permit to facilitate the expansion of the Project, which includes the following activities:

- Increasing waste rock dump capacity by construction of the Eastern Waste Landform Stage 2 (EWL2)
- Construction of the Southern Material Stockpiles
- Duplication of a raw water pipeline
- Maintaining vegetation regrowth on the aerodrome perimeter
- Construction of an access road between the aerodrome and the mine camp
- Topsoil stockpile areas
- Haul roads, access tracks and groundwater monitoring bores.

MARBL currently operate under CPS 10346/1, with this application including the clearing approved under this permit. Once this application is approved, CPS 10346/1 will be withdrawn.

PROPOSED CLEARING

MARBL proposes to clear 683.8 hectares (ha) and expand the permit boundary currently approved under CPS 10346/1. A breakdown of these clearing extents is presented in Table ES-1.

Table ES-1: Summary of Approved and Proposed Clearing

Description	Area (ha)
Cleared under CPS-9911/1, reported in 2023 AER	51.1*
Approved under CPS-10346/1	397.2
New proposed clearing under this application	286.6
Total for CPS 10346/2	**683.8**

**51.1ha is not included in this application total as this clearing was completed under CPS9911/1 during 2023 reporting period, with this permit to be superseded/withdrawn.*

The proposed NVCP permit boundary and indicative clearing footprint are presented in Figure ES-1.

BIOLOGICAL SURVEYS

Since the CPS 10346/1 application, additional biological survey for the Project were conducted in 2023 and 2024 with the results presented in the following reports:

- Flora and Vegetation Assessment - Wodgina Lithium Operation - February 2025 (Umwelt, 2025)
- Detailed terrestrial fauna survey for the Wodgina Lithium Project – mine area, airstrip, Breccia borefield and infrastructure corridor (Phoenix, 2024)

The above reports, provided as Appendix D and Appendix E, are used to inform this application.

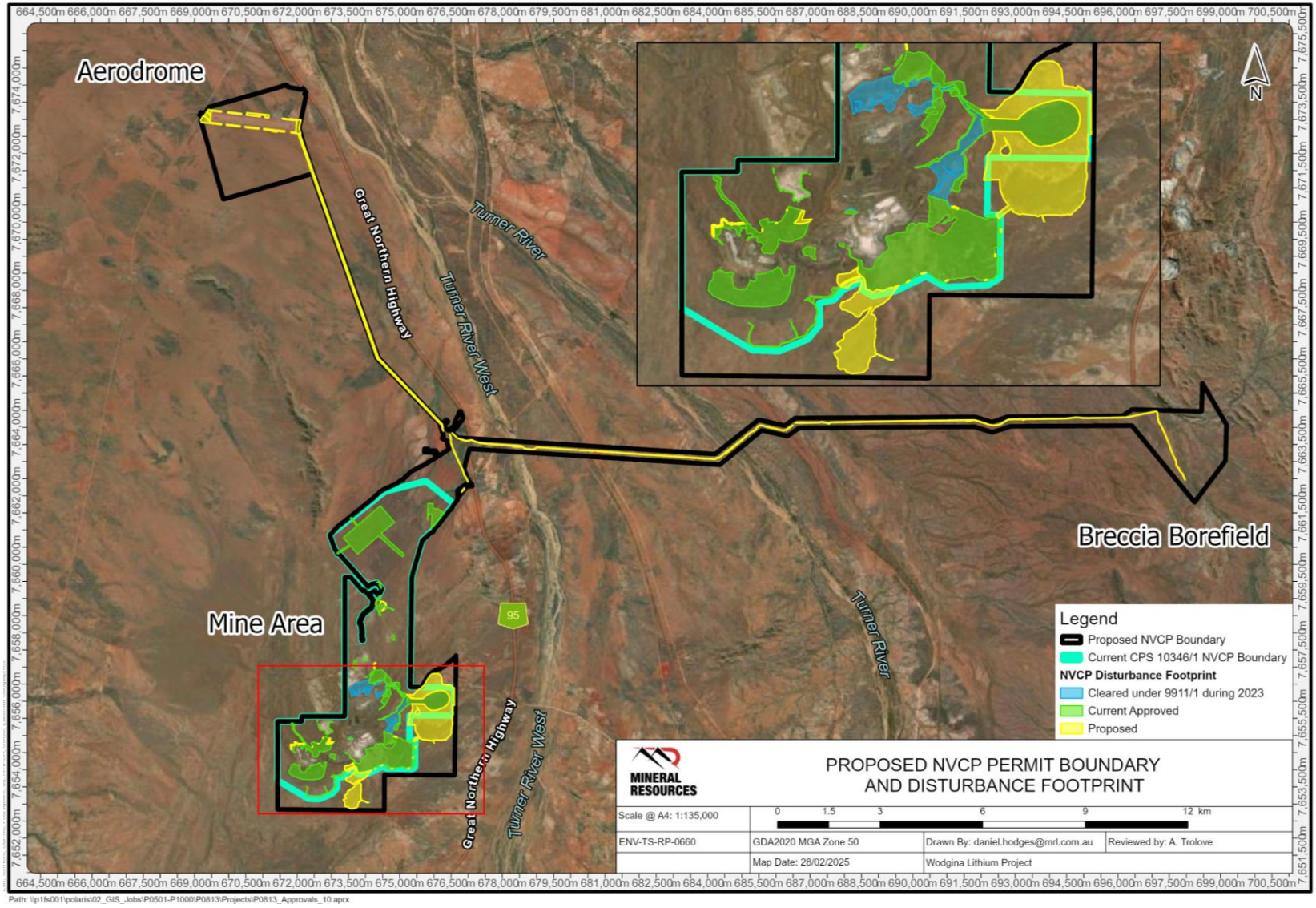


Figure ES-1: Map of Proposed NVCP Permit Boundary and Disturbance Footprint

SUMMARY OF POTENTIAL IMPACTS

Vegetation

No Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) were recorded in the Project area. Groundwater Dependent Vegetation (GDV) is likely to be present near the main channels of the Turner River and larger tributaries, however proposed disturbance to this vegetation is limited.

Four vegetation systems were mapped within the proposed NVCP Permit Area, with three intersecting the proposed disturbance footprint which will be directly impacted by clearing activities. The direct impacts from proposed clearing are considered low, with pre-European remaining extents remaining above 99 percent (%) for each vegetation system.

Impact from the proposed clearing to Vegetation Types (VT) as mapped by Umwelt (2025) is considered low, as less than (<) 25 % of each mapped VT within the Study Area will potentially be impacted.

Flora

One threatened flora species (*Quoya zonalis*) was recorded by Umwelt (2025), however is located approximately 8 km from the NVCP Permit Area and is therefore not considered at risk.

Nine species of significant flora species were recorded by Umwelt (2025), with the following four species intersecting the proposed Disturbance Footprint:

- *Euphorbia clementii (P3)*
- *Euploca mutica (P3)*
- *Terminalia supranitifolia (P3)*
- *Triodia chichesterensis (P3)*

Although the proposed clearing will result in local impacts to priority flora species and further increase fragmentation of the populations, the cumulative direct local impacts are considered low, as <25% of known local individuals or area of habitat may potentially be impacted.

A draft condition is provided, which limits the number of significant flora taxa to be impacted.

Fauna

Searches of several biological databases was completed by Phoenix (2024) to identify conservation significant fauna that may occur within the study area. A total of 402 vertebrate species were identified, with 16 significant vertebrate species having been recorded near the Project.

Six conservation significant fauna recorded during the 2023 and 2024 surveys by Phoenix (2024) including:

- Northern Quoll (*Dasyurus hallucatus*) (VU)
- Ghost Bat (*Macroderma gigas*) (VU)
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (VU)
- Greater Bilby (*Macrotis lagotis*) (VU)
- Rufous Grasswren (*Amytornis whitei* subsp. *Whitei*) (P4)
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4)

Habitats in the region that would provide critical habitat for significant vertebrates include Rocky ridge and gorge and Drainage line. Additionally, Ghost bat and Pilbara Leaf-nosed Bat roosts are present near the Project.

Draft conditions to limit the potential impacts to conservation significant fauna have been provided, which include:

- Disturbance to Rocky ridge and gorge and Drainage line habitats is limited to the disturbance amount proposed in this application.
- Exclusion zones around significant roosts (Category 1, 2 and 3) of Ghost bat and Pilbara Leaf-nosed Bat will be implemented.

The potential impact to five of the recorded vertebrate fauna species is considered low.

The potential impact to the Northern Quoll is considered Moderate due to the loss of shelter and breeding habitat. However, the reduction in population size is unlikely to prevent the long-term persistence of the species in the rocky range at Wodgina. The proposed disturbance under this application is 2.0% of mapped Rocky ridge and gorge from mapped habitat in 2009. Cumulative disturbance since 2009 is 63.4 ha, or 8.7% of mapped Rocky ridge and gorge in 2009.

Phoenix (2024) identified no significant invertebrate taxa, or any taxa confirmed as Short-Range Endemic (SRE). Of the 27 taxa identified, 20 are Potential, three are Widespread and four are of Uncertain SRE status due to not being able to allocate a species-level identification. The potential impact from the proposed activities to invertebrate or SRE species is considered low.

COMPARISON TO EPBC REFERRAL

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as Matters of National Environmental Significance (MNES).

On 8 May 2018, the previous planned Wodgina expansion was referred to the Department of Environment and Energy (DEE), now named the Department of Climate Change, Energy, the Environment and Water (DCCEEW), pursuant to the EPBC Act.

This referral included a total proposed Disturbance Footprint of 560 ha (320 ha within the mine site and 240 ha along the pipeline). The referral proposed clearing to habitat types considered critical to conservation significant fauna, including:

- 36.8 ha of Rocky Ridge and Gorge habitat, and
- 26.4 ha of Drainage Line habitat.

The DEE issued a decision on 2 November 2018 advising that the Project is not a controlled action (EPBC 2018/8194).

As part of this application, MARBL has considered the potential impacts of the proposed clearing in relation to MNES using the 2018 EPBC referral as a guide. A comparison of the critical habitats proposed for clearing in the 2018 EPBC referral and cumulative clearing undertaken to date, currently approved, and proposed in this application is provided in Table ES-2.

The extent of disturbance to habitat for MNES proposed in this NVCP application is not significantly different from that addressed in the previous referral under the EPBC Act. As no significant increase in potential impacts to MNES is proposed, further referral under the EPBC Act is not proposed.

Table ES-2: Comparison of critical habitat disturbance between 2018 EPBC Referral and NVCPs

Habitat	2018 EPBC Referral	NVCPs 2018-2024					Difference
		Cleared Under CPS-8068/2	Cleared under CPS-9911	CPS10346/1 footprint	Additional this application	NVCP total	
Rocky Ridge and Gorge	**36.8 ha**	0.0 ha	9.3 ha*	22.7 ha*	1.1 ha	**33.1 ha**	- 3.7 ha
Drainage Line	**26.4 ha**	3.7 ha	2.5 ha	9.4 ha*	14.4 ha	**30.0 ha**	+ 3.6 ha

ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

The proposed NVCP Application is not at variance or not likely to be at variance with nine out of ten Clearing Principles.

Clearing Principle B may be at variance due to the potential impact to Northern Quoll as the loss of shelter and breeding habitat is likely to be permanent, as it is difficult to re-create with rehabilitation. However, the reduction in population size is unlikely to prevent the long-term persistence of the species in the rocky range at Wodgina.

A full assessment of the proposed NVCP Application against the Clearing Principles is provided.

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Appendix B Tenement Reports

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Appendix D Flora and Vegetation Assessment (Umwelt, 2025)

Appendix E Detailed Terrestrial Fauna Survey Report (Phoenix, 2024)

Appendix F Targeted Significant Fauna Survey (Stantec, 2022)

Appendix G Flora, Vegetation and Fauna Impact Assessment (Umwelt, 2022)

Appendix H Map Packages

ABBREVIATIONS

Abbreviation	Definition
AER	Annual Environmental Report
BC Act	*Biodiversity Conservation Act 2016*
BOM	Bureau of Meteorology
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DBCA	Department of Biodiversity, Conservation and Attractions (WA)
DEC	Department of Environment and Conservation (WA) now DWER
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety (WA)
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation (WA)
EMS	Environmental Management System
EN	Endangered
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys and Assessments
km	Kilometre
LAP	Land Activity Permit
LGA	Local Government Area
m	Metre
MARBL	MARBL Lithium Operations Pty Ltd
MCP	Mine Closure Plan
MI	Migratory Species
Mining Act	*Mining Act 1978*
MinRes	Mineral Resources Limited
NVCP	Native Vegetation Clearing Permit
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
RIWI Act	*Rights in Water and Irrigation Act 1914*
SRE	Short-range endemic
TEC	Threatened Ecological Community
TSF	Tailings Storage Facility

Abbreviation	Definition
VT	Vegetation Type
Vu	Vulnerable
WA	Western Australia
WONS	Weeds of National Significance

1. BACKGROUND AND SCOPE

1.1 PROJECT CONTEXT

The Wodgina Lithium Project ("Wodgina" or the "Project") is a polymetallic mining operation located in the Pilbara region of Western Australia. The current commodity targeted at Wodgina is lithium.

The Project is located approximately 110 kilometres (km) south of Port Hedland in the Pilbara Region of Western Australia.

MARBL Lithium Operations Pty Ltd (MARBL), a joint venture between Mineral Resources Limited (MinRes) and the Albemarle Corporation (Albemarle), is applying for a new Native Vegetation Clearing Permit (NVCP) Purpose Permit, which will supersede the current approved CPS 10346/1, to facilitate the expansion of the Project. The proposed application includes a total increase of clearing by 286.6 hectares (ha).

The regional location of the Project is presented in Figure 1.

1.2 EXISTING OPERATIONS

Since discovery in 1902 and commencement of mining in 1904, Wodgina has been mined for tin, tantalum, niobium, beryllium, iron ore and lithium, moving through several configurations and owners as market conditions changed and exploration progressed. The Project currently comprises of the following infrastructure:

- Active pit – Cassiterite Pit
- Inactive pit – Hercules North, Hercules South, Anson, Arvo, Dragon and Constellation Pits
- Active waste landform – Eastern Waste Landform, stockpile areas
- Inactive waste landform – Atlas, Hercules and Valley Waste Dump
- Active Tailings Storage Facility (TSF) – Atlas In-Pit TSF
- Inactive TSF – TSF3, TSF3E
- Crushing and screening plant
- Beneficiation plant consisting of three process trains (with approval to construct a fourth train)
- Dry stack tailings plant and loadout area
- Concentrate storage areas
- Water dams and retention basins
- Wastewater Treatment Facility
- Reverse Osmosis (RO) water treatment plant
- Ancillary activities such as workshops, access roads, groundwater borefields, topsoil stockpiles, aerodrome, landfill.

Some areas of the Project are no longer active, with rehabilitation activities been completed.

1.3 PERMIT HISTORY

Several NVCP applications have been submitted and either approved or withdrawn at the Project. A summary of these applications is presented in Table 1.

The historic NVCP permit boundaries are presented in Figure 2.

The current active NVCP permit boundaries are presented in Figure 3.

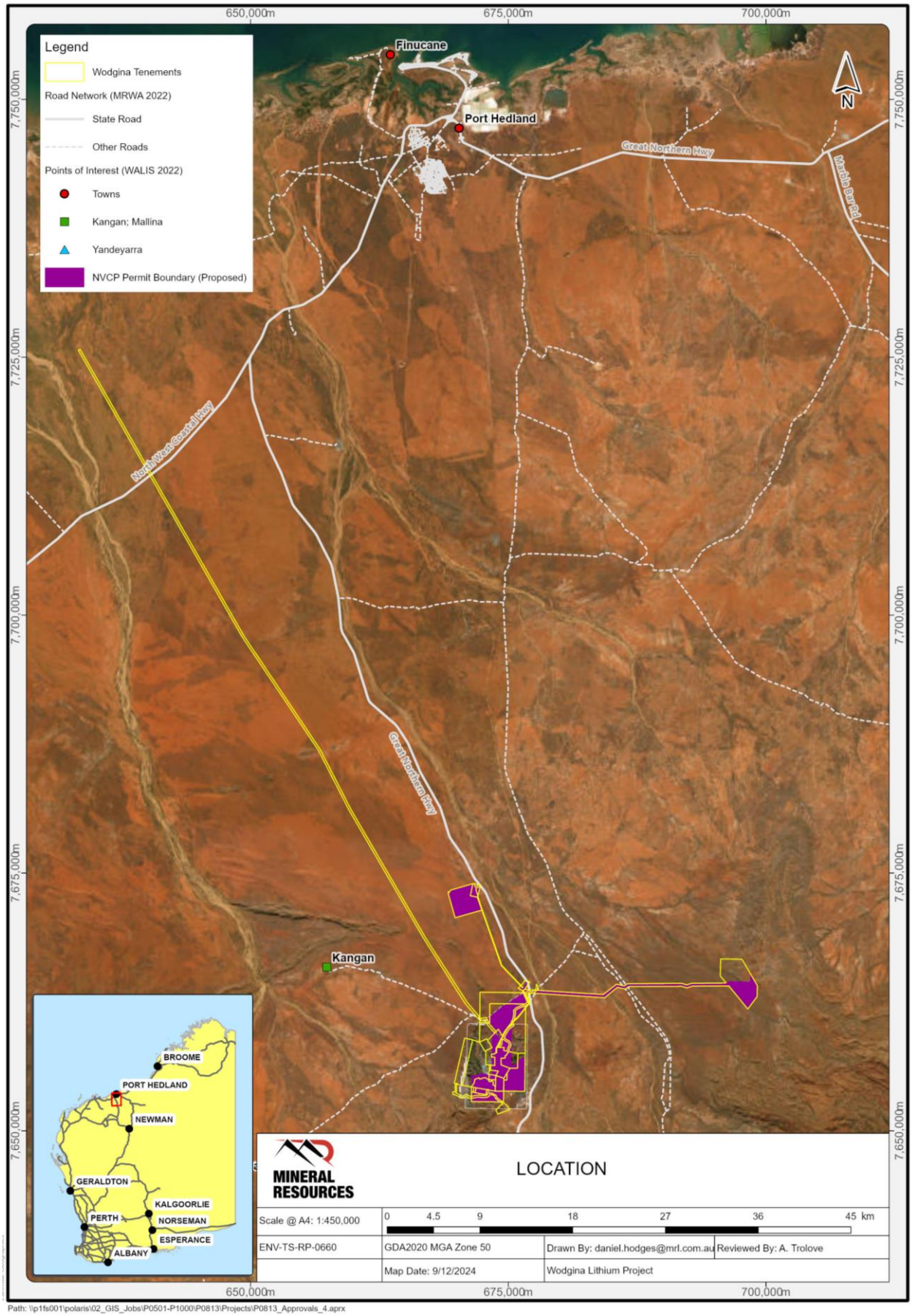


Figure 1: Map of Regional Location

Table 1: Wodgina NVCP Application History

Permit ID (CPS)	Permit Holder	Issued Date	Expiry Date	Allocation (ha)	Area cleared under permit (ha)	Description	Status
2951/1	Talison Minerals Pty Ltd	23/05/2009	31/03/2019	15	Not available	TSF3 expansion west	Expired
3441/1	Atlas Iron Limited	06/03/2010	06/03/2015	80	Not available	Atlas iron ore DSO mining	Expired
4666/1	Atlas Iron Limited	14/01/2012	14/01/2017	162	Not available	Additional clearing to Iron Ore DSO mining	Expired
4984/3	Atlas Iron Limited	22/09/2012	31/12/2019	282 *only ~10ha within Wodgina project area	Not available	~10ha clearing within Breccia Borefield (L45/105). NVCP is associated with Abydos Mine.	Expired
5564/2	Atlas Iron Limited	20/07/2013	20/07/2018	173	Not available	Hercules iron ore DSO mining	Expired
8048/1	Wodgina Lithium Pty Ltd	18/08/2018	18/08/2023	122.9	117.7	Wodgina aerodrome	Expired
8054/1	Wodgina Lithium Pty Ltd	-	-	395	-	-	Withdrawn
8068/2	Wodgina Lithium Pty Ltd	03/11/2018	02/11/2028	293	239.15	Gas Pipeline corridor. Revision extended expiry date and increased allocation by 53 ha.	Current
8230/1	Wodgina Lithium Pty Ltd	-	-	462.5	-	Cassiterite Pit cutback, EWL expansions, TSF4	Withdrawn
8295/1	Wodgina Lithium Pty Ltd	-	-	300	-	Lithium hydroxide plant	Withdrawn
9911/1	MARBL Lithium Operations Pty Ltd	16/03/2023	15/03/2028	113.8	113.8	Cassiterite Pit cutback and EWL expansion	Replaced by CPS 10346/1
10346/1	MARBL Lithium Operations Pty Ltd			444.36	-	EWL expansion, Atlas TSF, Evaporation Pond, Low-grade ore Stockpile, landfill expansion, Train 4, access tracks, clearing of regrowth on laydown areas.	Current

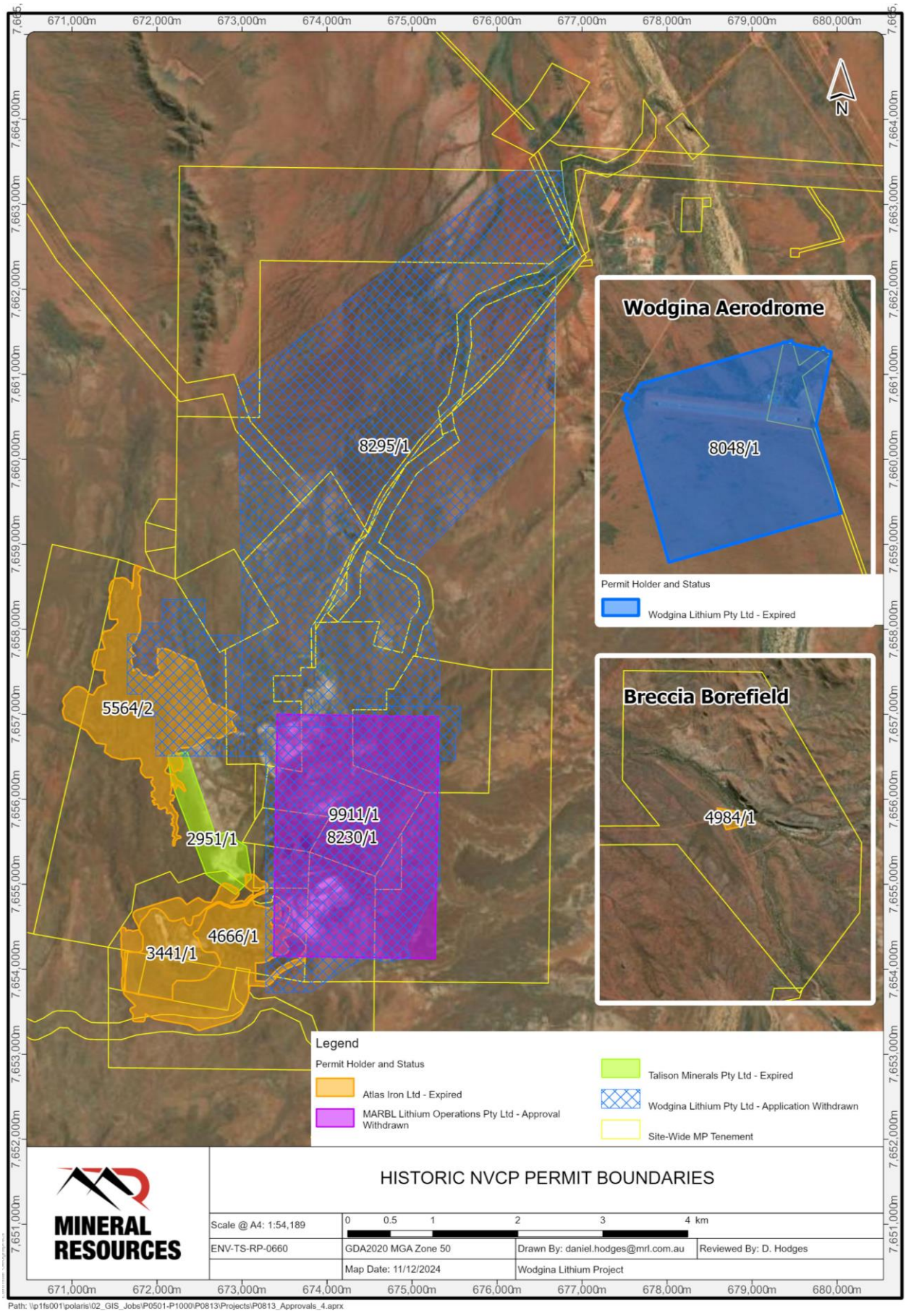


Figure 2: Map of Historic NVCP Permit Boundaries

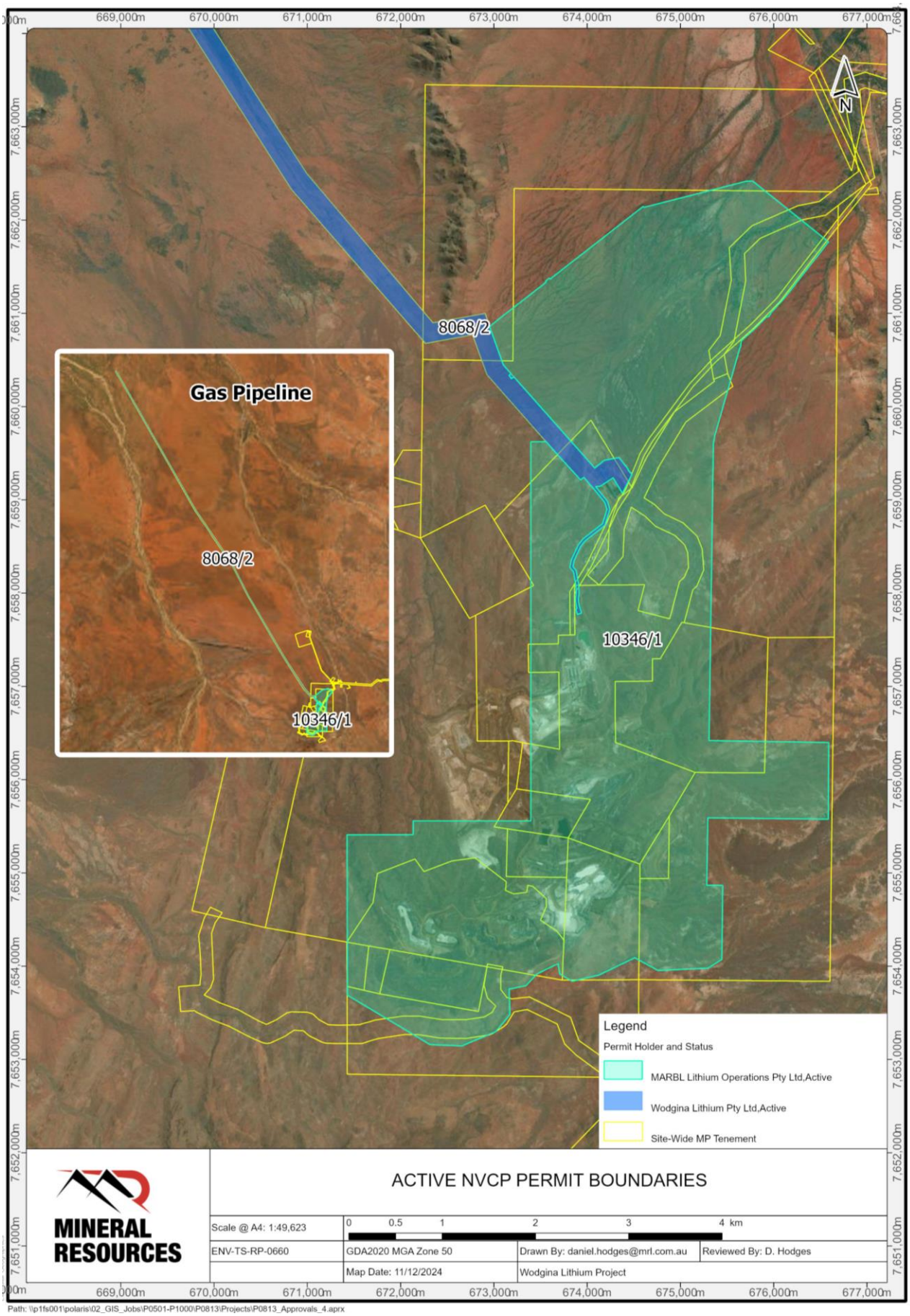


Figure 3: Map of Active NVCP Permit Boundaries

1.4 PURPOSE OF THIS DOCUMENT

The purpose of this document is to present the results of an assessment of the proposed clearing for the Project against the ten clearing principles as outlined in the Department of Environmental Regulation (DER) (2014a) *Guide to Assessment: Clearing of Native Vegetation under the Environmental Protection Act 1986*. This report identifies the potential environmental impacts associated with the clearing phase of the Project based on the best available data. This NVCP application will be submitted to DEMIRS as clearing is to be carried out on mining tenements.

This document provides supporting information to "Application for new permit or referral to clear native vegetation (NV-F01 v12.0 [v15, March 2024])".

Proposed clearing is detailed in Section 2.

2. PROPOSED CLEARING

2.1 PURPOSE AND DESCRIPTION OF CLEARING

The purpose of the proposed clearing is to allow for continued mining operations and maintain existing infrastructure. The scope of activities includes:

- Increasing waste rock dump capacity by construction of the Eastern Waste Landform Stage 2 (EWL2)
- Construction of the Southern Material Stockpiles
- Duplication of a raw water pipeline
- Maintaining vegetation regrowth on the aerodrome perimeter
- Construction of an access road between the aerodrome and the mine camp
- Topsoil stockpile areas, and
- Haul roads, access tracks and groundwater monitoring bores.

MARBL proposes to increase the total clearing allocation of CPS10346/1 from 448.36 hectares (ha) to 683.8 ha and expand the permit boundary. A breakdown of these clearing extents is presented in Table 2.

Table 2: Summary of Approved and Proposed Clearing

Description	Area (ha)
Cleared under CPS-9911/1, reported in 2023 AER	51.1*
Approved under CPS-10346/1	397.2
New proposed clearing under this application	286.6
Total for this application	**683.8**

**51.1ha is not included in the applications total as this clearing was completed under CPS9911/1 during 2023 reporting period, with this permit to be withdrawn.*

The proposed NVCP permit boundary and indicative clearing footprint are presented in Figure 4.

The current approved clearing under CPS 10346/1 allows for the following activities:

- Expansion to the Cassiterite Pit
- Expansion to the Eastern Waste Landform Stage 1 (EWL1)
- Expansion to the Processing Plant footprint
- Construction of an Evaporation Pond
- Construction of a Low-grade Ore Stockpile
- Expansion of the Atlas In-Pit Tailings Storage Facility (TSF)
- Construction of the Atlas NAF Stockpile
- Ancillary activities such as landfill, a camp expansion, haul roads, topsoil stockpiles, bores and access tracks.

2.2 METHOD OF VEGETATION DISTURBANCE

MinRes undertakes all clearing and ground disturbance in accordance with the company's *Land Activity Permit (LAP) and Clearing Procedure*. A LAP is an internal approval instrument used by

MinRes to identify external compliance requirements, mitigate impacts to land, and protect stakeholder relationships.

Compliance with the *LAP and Clearing Procedure* is intended to:

- Support development and construction in line with approvals commitments and obligations.
- Avoid, and wherever avoidance is not possible, minimise impacts to biodiversity, environment, and heritage.
- Ensure stakeholders are adequately informed of planned activities, and
- Protect MinRes' reputation and social license to operate.

To ensure the above is achieved, each LAP is approved with a set of internal conditions to ensure the user is aware of and understands the obligations relevant to the activity. The requirements of the *LAP and Clearing Procedure* in relation to vegetation clearing is summarised below:

- Prior to clearing, a LAP will be completed and signed off by the Environmental Department and other key internal stakeholders. Review of the proposed clearing will consider environmental approvals such as those outlined in Section 4, including conditions listed on the relevant NVCP.
- Clearing areas will be delineated in accordance with the LAP. Survey pegs and flagging tape are used to demarcate the final extents of approved clearing.
- Vegetation will be removed prior to topsoil striping. Vegetation will generally be cleared 'blade up' with bulldozers or graders.
- Topsoil, the upper portion of the soil profile, will be stripped to an appropriate depth and placed in stockpiles (paddock dumped to approximately 2 m in height (single dump height) with adequate distance between them to create a series of mounds and troughs). The topsoil stripping depth at Wodgina is a nominal 150mm, however topsoil can be absent on slopes.
- Subsoil will also be stripped, where appropriate, and stockpiled separately to ensure adequate capping and growth media is collected.
- Machinery operators will aim to minimise the frequency and intensity of soil handling to avoid compromising the structural integrity of the material. Handling of topsoil will be minimised, particularly when wet.
- Soil stripping is planned to occur as close as possible to the development of land into the final land use.
- At completion of the works prescribed on each LAP, a review of compliance with the internal LAP conditions is undertaken, with any breaches raised as incidents for further internal investigation.

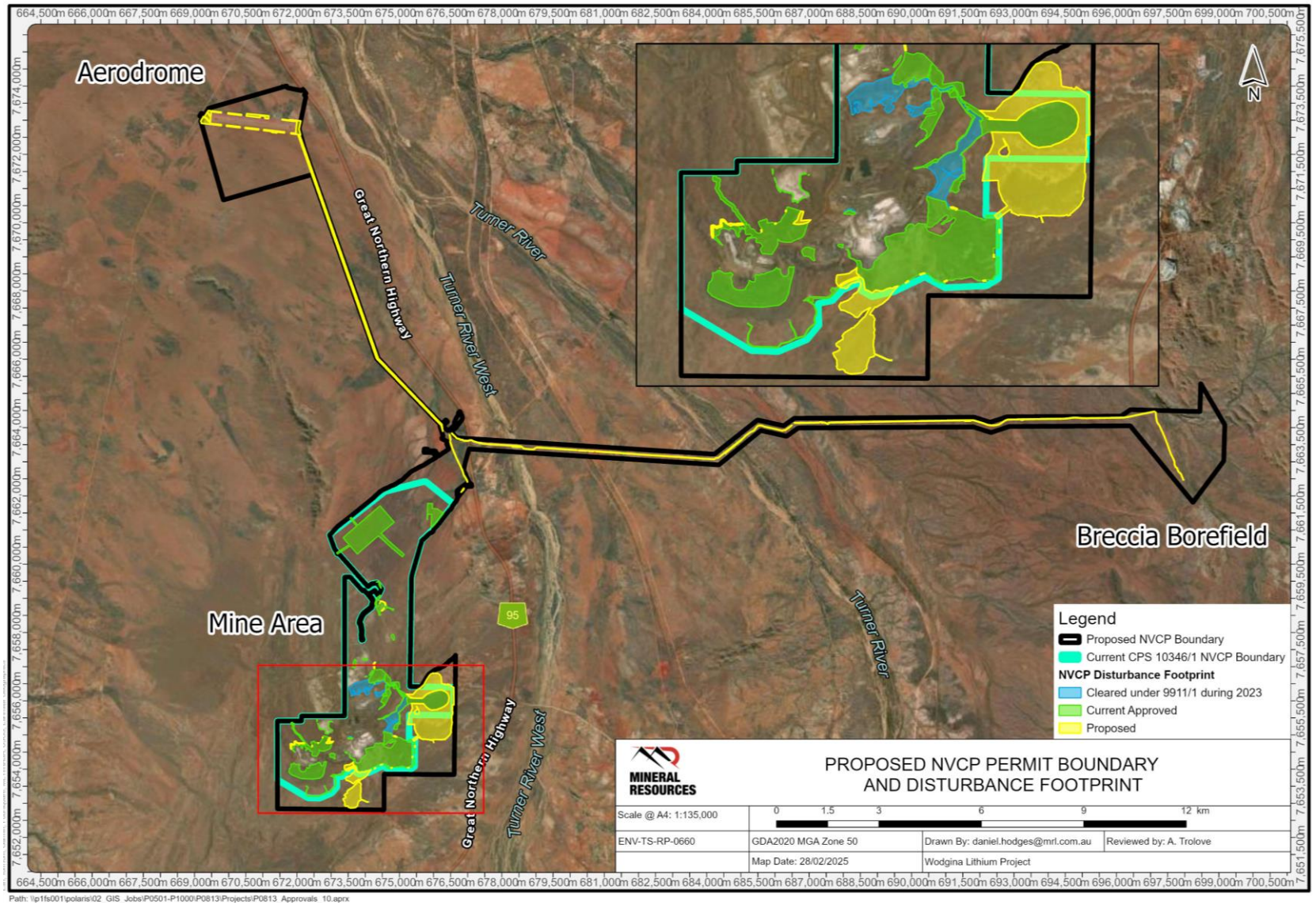


Figure 4: Map of Proposed NVCP Permit Boundary and Disturbance Footprint

2.3 AVOIDANCE AND MITIGATION

2.3.1 Environmental Management System

The MinRes Environmental Management System (EMS) integrates various levels of policy, procedure, instruction and processes to manage the potential environmental impacts of mining, exploration and ancillary activities. The EMS is structured to provide a standardised approach to managing legal compliance and environmental risk while having the flexibility to adapt to site or stage specific risks.

The EMS is developed from overarching Policy and a set of corporate environment Standards to outline the minimum expectations for managing environmental risks. A set of Operational Procedures, Instructions, Templates, Forms, Plans and any other required documents create the framework for the EMS.

2.3.2 Risk Identification and Management

Risk identification is based on legislative requirements and managing key environmental factors, biodiversity, water resources, land and soil, rehabilitation and mine closure.

Risk registers are developed for individual sites and/or activities to ensure that key risks are identified, impacts are assessed, and mitigating controls are adequate to reduce likelihood and consequence. Risk registers are reviewed on a regular basis to ensure they reflect the stage of the Project, account for changing circumstances, controls are being implemented and risks are being adequately managed.

The risks associated with the activities proposed in this application have been assessed and, where necessary, managed using a mitigation sequence which involves avoiding or minimising the residual impacts of mining activities on the environment.

The key objectives of environmental management for the proposed Purpose Permit Area are to:

- Identify all likely environmental impacts arising from the clearing and determine significant impacts requiring the implementation of special management procedures.
- Develop and declare the environmental management commitments necessary to minimise, control, ameliorate and rehabilitate significant impacts.

Potential impacts from the proposed clearing include:

- Habitat loss leading to population decline and population fragmentation.
- Changes to local hydrology.
- Degradation of habitat due to weed invasion.
- Ongoing mortality from operations (e.g. potential road incidents involving Northern Quoll).
- Impacts of feral predators and an increase in abundance of predatory and/or scavenging bird species.
- Altered fire regimes and disturbance (dust, noise and light).

MinRes has an EMS; this system includes awareness training, plans, procedures and forms to avoid, minimise and ensure the effective management of environmental and heritage values.

MinRes has adopted the mitigation sequence for environmental management, which involves avoiding, minimising, and offsetting the significant residual impacts of mining activities on the environment as further defined below. These are considered sufficient to ensure the effective management of environmental risks by the proposal.

Avoid:

- Proposed clearing has been minimised to reduce the extent of disturbance required.
- A LAP and the Clearing Procedure will be implemented to ensure all clearing works are compliant with regulatory requirements and are within approved boundaries.
- The area to be cleared shall be clearly demarcated and machinery operators made aware of the operational boundary, following confirmation with the relevant manager. Some heavy equipment used may have in-cab GPS mapping and alarm functions however in the absence of this functionality, other control measures such as the use of spotters and/or restricting clearing to the daylight hours will be undertaken.
- Off-road driving shall be prohibited unless authorised via a LAP.
- Unless approved for disturbance, areas of confirmed with Priority Flora will be avoided.

Minimise:

- Induct and educate personnel on environmental requirements of the Proposal.
- Clearing awareness training undertaken by all personnel involved in clearing activities.
- Vegetation clearing shall be kept to the minimum amount required.
- Utilise existing access tracks.
- Weed control and management methods will be implemented during operations where required.
- Undertake staged clearing.
- Clearing will be undertaken in a slow, progressive manner towards adjacent native vegetation to allow fauna to move out of the clearing area.
- Utilise already cleared land where suitable for supporting infrastructure.
- Machinery and vehicle movements should be restricted during construction to minimise the potential for vehicle strikes, where practicable.
- Machinery and vehicle movements that must be undertaken between dusk and dawn should be limited to low speeds on access tracks.
- Excavations and trenches will be kept open only as long as needed to undertake the work and egress points will be provided dependant on depth / morphology of the excavation. Open trenches will be inspected twice-daily for trapped fauna.
- Feral species management where required.
- Manage existing surface water flows where possible.
- Manage and contain surface water flows from disturbed areas.

Rehabilitate:

- Implement appropriate rehabilitation in accordance with the approved Mine Closure Plan (MCP).
- Undertake progressive rehabilitation at the mine.
- Salvage and stockpile soil and/or habitat features (e.g. vegetation, stumps, logs, boulders) for use in rehabilitation programs.'

2.4 REHABILITATION AND MAINTENANCE

MinRes will implement its approved Mine Closure Plan (MCP) (the current approved MCP is Reg ID 122942, however a new Mining Proposal and MCP is being prepared to align with the activities proposed in this Application) in accordance with *Mine Closure Plan Guidance – How to prepare in accordance with Part 1 of the Statutory Guidelines for Mine Closure Plans* (Department of Mines Industry Regulation and Safety, 2020).

Progressive rehabilitation has been undertaken and will continue over the life of the mine. An appropriate rehabilitation plan incorporating surface treatments and seed selection, collection, storage, and management will be implemented.

Landforms constructed will be designed to be safe and non-polluting and constructed so that final shape, size, stability, and ability to support local native vegetation are comparable to natural landforms in the area.

Weed and hygiene management measures will be implemented prior to ground disturbing equipment arriving on site to minimise the risk of spreading or introducing weeds within the proposed Purpose Permit Area.

2.5 INDICATIVE TIMELINE

Subject to approval, clearing for the Project under this permit is anticipated to commence in quarter one of 2025. An indicative implementation schedule is shown in Table 3.

Table 3: Indicative timeline for clearing activities

Stage	Indicative Timing
Commence Clearing	Q3 2025
End of clearing activities under this permit	Q3 2030

3. PROJECT DESCRIPTION

3.1 REGIONAL SETTING

The proposed NVCP Permit Area is located within the Pilbara region and Chichester (PIL01) subregion of the Pilbara Bioregion (DAWE, 2012). The Chichester subregion has undulating Archaean granite and basalt plains including significant areas of basaltic ranges. Plains support a shrub steppe characterised by *Acacia pyrifolia* over *Triodia pungens* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on the ranges.

3.2 TENURE AND LAND ACCESS

The Purpose Permit boundary intersects the tenure presented in Table 4 and presented in Figure 5.

Table 4: Tenement Details

Tenement ID	Holder	Expiry
G 45/290	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	21/01/2031
G 45/291	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	21/01/2031
G 45/321	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	4/10/2032
L 45/105	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	31/05/2043
L 45/437	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	10/04/2039
L 45/441	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	20/11/2039
L 45/443	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	4/11/2039
L 45/58	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	8/12/2028
L 45/93	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	24/03/2028
M 45/1188-I	Atlas Iron Pty Ltd (transfer to Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd in progress)	11/11/2030
M 45/1252-I	Atlas Iron Pty Ltd (transfer to Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd in progress)	22/03/2037
M 45/254	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	28/10/2029
M 45/353	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	18/05/2030
M 45/365-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	9/10/2030
M 45/381	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	11/07/2030
M 45/382	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	11/07/2030
M 45/383-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	11/07/2030
M 45/49	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	3/07/2026
M 45/50-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	3/07/2026
M 45/887-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	21/03/2043
M 45/888	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	21/03/2043
M 45/923-I	Global Advanced Metals Wodgina Pty Ltd	25/03/2043

Tenement ID	Holder	Expiry
M 45/924-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	25/03/2043
M 45/925-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	25/03/2043
M 45/949	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	10/07/2043
M 45/950-I	Wodgina Lithium Pty Ltd, Albemarle Wodgina Pty Ltd	10/07/2043

Two tenements are registered in the name of Global Advanced Metals Wodgina Pty Ltd (GAMW), and two tenements are registered in the name of Atlas Iron Limited (Atlas).

In accordance with agreements with each of GAMW and Atlas, WLPL (and consequently the MARBL JV) has the right to be transferred those tenements and has the right to access and undertake activities on those tenements.

MARBL are progressing the purchase of tenements M45/1188 and M45/1252 from Atlas. To conduct activities on these tenements prior to completion of the transfer, MARBL and Atlas have executed "Deed – Assumption and Release of Wodgina Rehabilitation and Other Obligations" dated 20 December 2023. Under the terms of this agreement, MARBL will assume the outstanding rehabilitation obligations at the same time as taking transfer of M45/1188 and M45/1252.

The following supporting information is provided:

- Appendix A - Australian Securities and Investments Commission (ASIC) current company extract for MARBL.
- Appendix B - Mining tenement summary reports demonstrating current holder details.
- Appendix C - Access agreements with GAMW and Atlas.

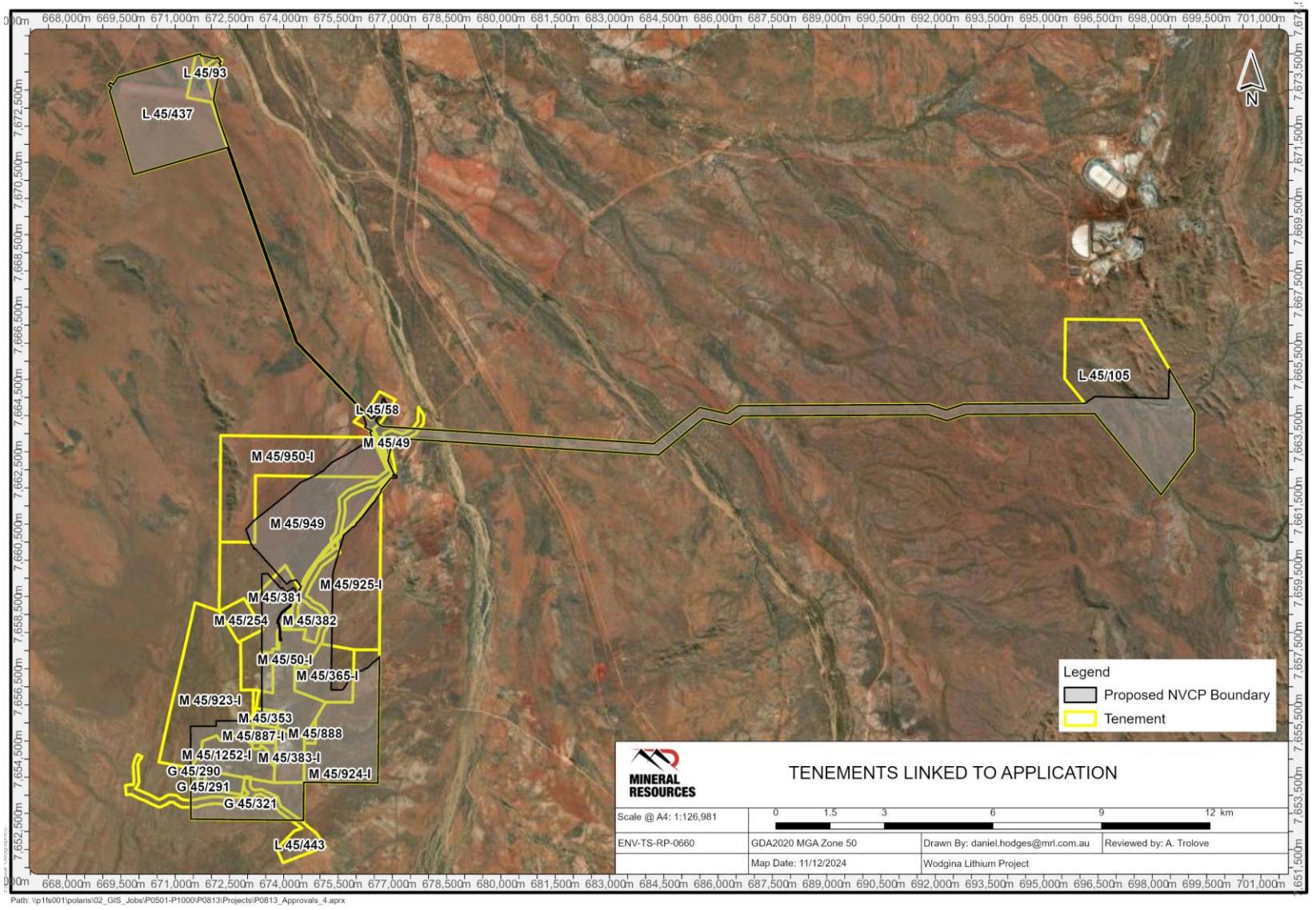


Figure 5: Map of Tenements Linked to Application

3.3 PERMIT AREA, SUPPORTING SURVEYS AND ASSESSMENTS

The proposed Purpose Permit area is an extension to the existing area approved under CPS-10346/1 and will also incorporate the expired CPS-8048/1, which will allow for a single Permit for the Project (excluding the gas pipeline).

Since the CPS10346/1 application, additional surveys have been undertaken in place of those conducted and described by Woodman Environmental (2020) and Western Wildlife (2020). These studies, as well as relevant existing studies and assessments, are described in Table 5.

The proposed permit boundary and extent of biological surveys (the Phoenix (2024) and Umwelt (2025) survey areas) are presented in Figure 6.

Table 5: Environmental Surveys and Impact Assessment – Scope and Regulatory Guidance

Title	Scope and Regulatory Guidance
Flora and Vegetation Assessment – Wodgina Lithium Project. February 2025. Umwelt (Australia) Pty Ltd (2025) Appendix D	The Assessment covers the Flora Study Area and includes a review and consolidation of previous flora and vegetation surveys/assessments plus results from 2019 and 2023 surveys completed to focus on previously unsurveyed sections of Wodgina. The assessment verified the previously surveyed areas of Woodman (2020) are still current. The 2024 flora and vegetation survey involved a detailed survey as defined in Section 4.3 of the Technical Guidance for flora and vegetation surveys (EPA, 2016b). In addition, the 2023 surveys of the 2023 Detailed and Reconnaissance Survey Areas involved a detailed and targeted survey, and reconnaissance and targeted survey, respectively, as defined in Sections 4.1 and 4.2 of the relevant Technical Guidance (EPA, 2016b); however, targeted survey was undertaken in specific parts of 2023 Detailed Survey Area only. The majority of proposed disturbance is within areas subject to targeted flora survey. The survey and reporting works comply with the following documents: • Environmental Factor Guideline – Flora and Vegetation (EPA, 2016a). • Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016b). IBSA submission: • Pre-2023 surveys = IBSA-2022-0342 • 2023 surveys = IBSASUB-20250228-C7B607D1 • 2024 surveys = IBSASUB-20250228-5B61BFEF
Detailed terrestrial fauna survey for the Wodgina Lithium Project – mine area, airstrip, Breccia borefield and infrastructure corridor. October 2024. Phoenix Environmental Sciences (2024) Appendix E	Detailed terrestrial fauna survey of the Project area, with surveys conducted over 2023 and 2024. The purpose of the survey was to document the key environmental values in respect to the terrestrial fauna assemblage in accordance with State and Commonwealth regulatory assessment requirements. The survey was undertaken in accordance with: • EPA Environmental Factor Guideline: Terrestrial fauna (EPA, 2016c) • EPA Technical Guidance: Sampling of SRE invertebrate fauna (EPA, 2016d) • EPA Technical Guidance: Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA, 2020) • A review of Ghost Bat ecology, threats, and survey requirements (Bat Call WA, 2021a) • A review of Pilbara Leaf-nosed Bat ecology, threats, and survey requirements (Bat Call WA, 2021b)

Title	Scope and Regulatory Guidance
	• EPBC Act referral guideline for the endangered Northern Quoll *Dasyurus hallucatus* (DoE, 2016) • Guideline for the survey and relocation of Bilby in WA (DBCA, 2018) • Interim, guideline for preliminary survey of Night Parrot (*Pezoporus occidentalis*) in WA (DPaW, 2017) • Survey guidelines for Australia's threatened bats (DEWHA, 2010) • Survey guidelines for Australia's threatened birds (DSEWPaC, 2010) • Survey guidelines for Australia's threatened mammals (DSEWPaC, 2011a) • Survey guidelines for Australia's threatened reptiles (DSEWPaC, 2011b). IBSA submission: • 2023 surveys = IBSA-2025-0085. • 2024 surveys = IBSASUB-20250228-F107E797
Memo Report: Wodgina – Targeted Significant Fauna Survey. June 2022. Stantec (2022) Appendix F	Targeted fauna survey which focused on determining the presence of significant fauna within the Rocky Ridge and Gorge habitat of the Study Area (proposed Disturbance Footprint). The survey and reporting works comply with the following documents: • Technical Guidance: Terrestrial Fauna Surveys for Environmental Impact Assessment (EPA, 2020) • Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016c) • Referral Guideline for the Endangered Northern Quoll (DoE, 2016) • Survey Guidelines for Australia's Threatened Mammals (DSEWPaC, 2011a) • Survey Guidelines for Australia's Threatened Bats (DEWHA, 2010) IBSA Submission: • IBSA-2022-0341
Flora, Vegetation and Fauna Impact Assessment. October 2022. Umwelt (2022) Appendix G	Impact assessment used to support the CPS9911/1 application. The methodology of this impact assessment was adopted to inform Section 9 of this report which uses the updated survey reports Phoenix (2024) and Umwelt (2025). The assessment of potential impacts of the proposed NVCP Application with regards to direct, indirect, local, regional, and cumulative impacts. Key aspects of the Impact Assessment include: • Quantification of direct impacts of the proposed Disturbance Footprint on vegetation units, conservation significant flora and critical habitat • Evaluation of indirect impact • Assessment of direct, indirect, and regional impacts, plus local, regional, and cumulative impacts • Investigation into historic clearing and the pre-disturbance environment The impact assessment is aligned with the following: • Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (DoE, 2013) • Environment Protection and Biodiversity Conservation Act 1999. (EPBC Act) referral guideline for the endangered northern quoll *Dasyurus hallucatus* (DoE, 2016)

Title	Scope and Regulatory Guidance
	• Conservation listing advice for *Macroderma gigas* Ghost Bat (TSSC, 2016a) • Conservation listing advice for *Rhinonicteris aurantia* (Pilbara form) Pilbara leaf-nosed Bat' (TSSC, 2016) • A guide to the assessment of applications to clear native vegetation, under Part V Division 2 of the Environmental Protection Act (DER, 2014)

3.4 PROXIMITY TO DBCA MANAGED LANDS

The closest DBCA managed Nature Reserve is the Mungaroona Range Natural Reserve. The Reserve is 'class A' and covers approximately 105,842 ha is located 50 km to the southwest of the NVCP Permit Area.

3.5 REGIONAL LAND USE

The Project is located on Kariyarra Country and the Traditional Owners of this area are the Kariyarra people. The main mining tenements are located on the Kangan Pastoral Lease, which is leased to the Aboriginal Prospecting Company and managed by the Yandeyarra Aboriginal Community. The Breccia Borefield to the east is located on the Wallareenya (Tabba Tabba) Pastoral Lease, and the gas pipeline to the north is located on the Indee and Mundabullangana pastoral leases.

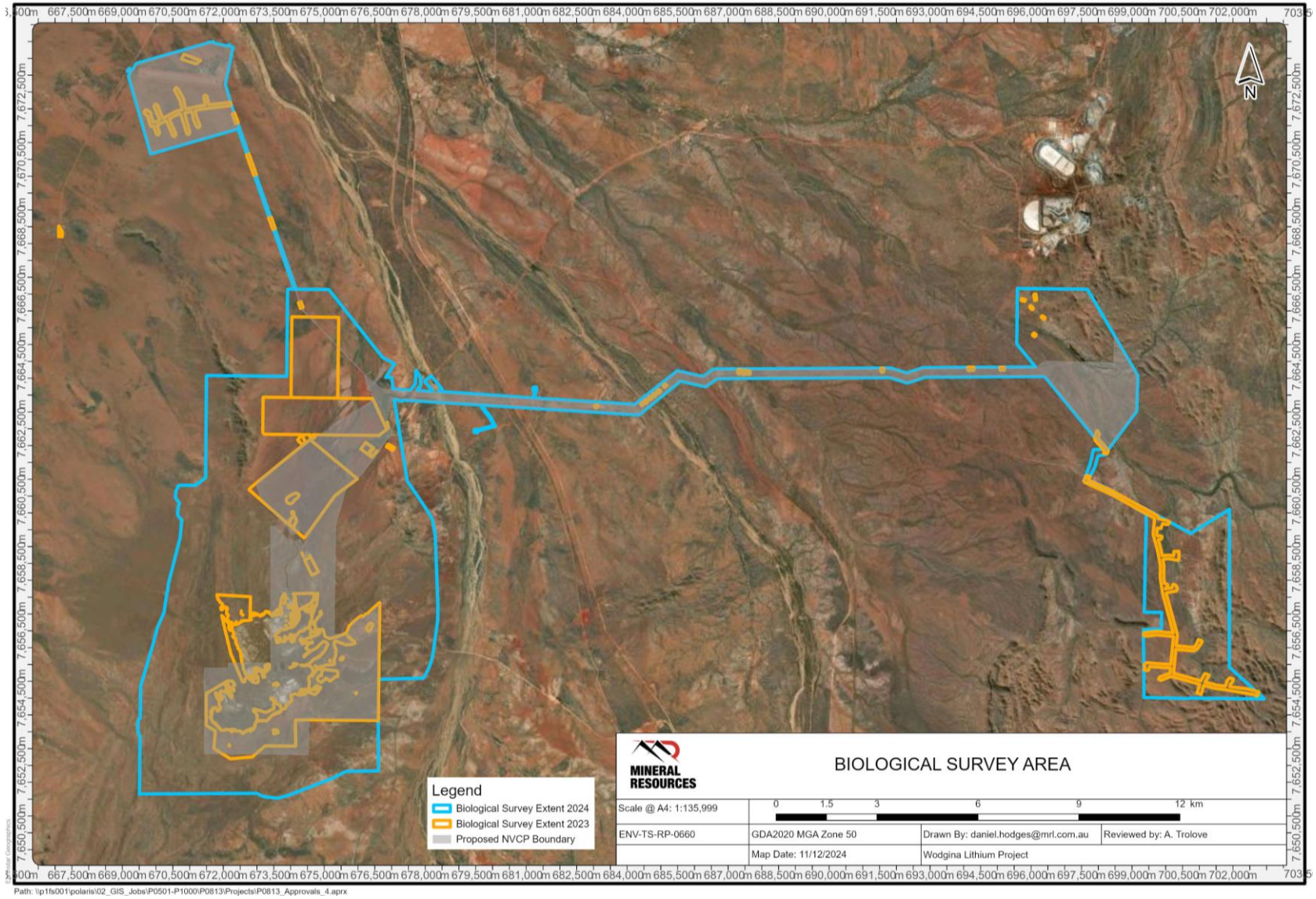


Figure 6: Map of Biological Survey Area

4. LEGISLATIVE FRAMEWORK AND OTHER APPROVALS

4.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as Matters of National Environmental Significance (MNES).

On 8 May 2018, the previous planned Wodgina expansion was referred to the Department of Environment and Energy (DEE), now named the Department of Climate Change, Energy, the Environment and Water (DCCEEW), pursuant to the EPBC Act.

This referral included a total proposed Disturbance Footprint of 560 ha (320 ha within the mine site and 240 ha along the pipeline). The referral proposed clearing to habitat types considered critical to conservation significant fauna (see Sections 8.2 and 9.4), including:

- 36.8 ha of Rocky Ridge and Gorge habitat, and
- 26.4 ha of Drainage Line habitat.

The DEE issued a decision on 2 November 2018 advising that the Wodgina Lithium Project is not a controlled action (EPBC 2018/8194).

As part of this application, MARBL has considered the potential impacts of the proposed clearing in relation to MNES using the 2018 EPBC referral as a guide. A comparison of the critical habitats proposed for clearing in the 2018 EPBC referral and clearing either undertaken to date, currently approved, and proposed in this application is provided in Table 6.

Table 6: Comparison of critical habitat disturbance between 2018 EPBC Referral and NVCPs

Habitat	2018 EPBC Referral	NVCPs 2018-2024					Difference
		Cleared Under CPS-8068/2	Cleared under CPS-9911	CPS10346/1 footprint	Additional this application	NVCP total	
Rocky Ridge and Gorge	**36.8 ha**	0.0 ha	9.3 ha*	22.7 ha*	1.1 ha	**33.1 ha**	- 3.7 ha
Drainage Line	**26.4 ha**	3.7 ha	2.5 ha	9.4 ha*	14.4 ha	**30.0 ha**	+ 3.6 ha

**Areas incorrectly listed in CPS 10346/1 application Supporting Document.*

The extent of disturbance to habitat for MNES proposed in this NVCP application is not significantly different from that addressed in the previous referral under the EPBC Act. As no significant increase in potential impacts to MNES is proposed, referral under the EPBC Act is not proposed.

The footprint of the 2018 EPBC referral against the NVCP application footprints and critical fauna habitat is presented in Figure 7.

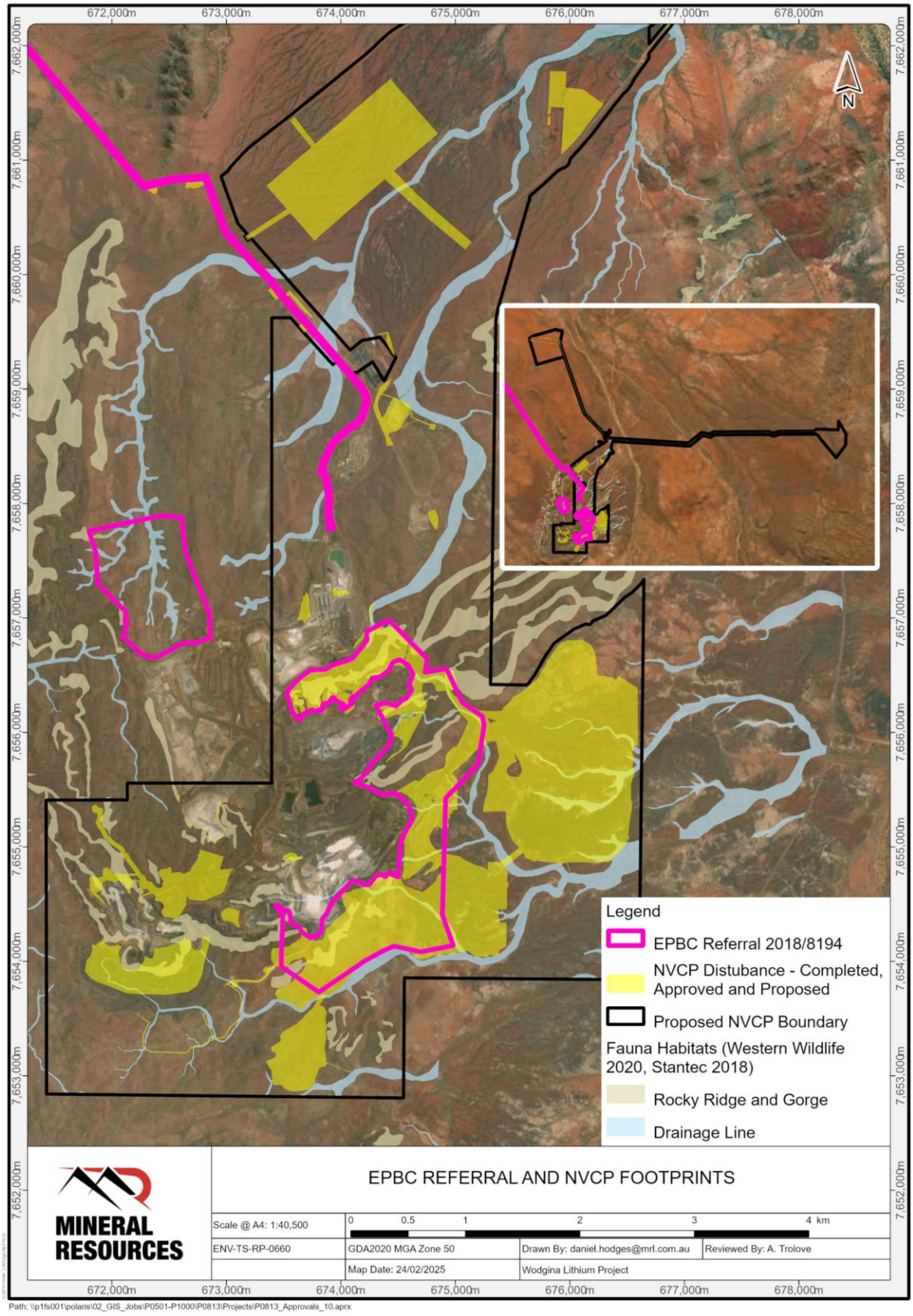


Figure 7: Map of EPBC Referral and NVCP Footprints

4.2 ENVIRONMENT PROTECTION ACT 1986

The *Environment Protection Act 1986* (EP Act) is the primary legislation that governs environmental impact assessment and protection in Western Australia. The EP Act establishes the Environmental Protection Authority (EPA) and lists its functions.

Approvals can be required under two parts of the EP Act: Part IV and Part V. Projects with the potential to significantly impact on the environment are assessed under Part IV, whilst prescribed premises (as listed under Schedule 1 of the *Environmental Protection Regulations 1987*) must be approved under Part V.

The EP Act is administered by the Department of Water, Environment and Regulation (DWER) and the EPA.

4.2.1 Part IV

On 12 June 2018, the previous planned expansion (footprint aligning to the 2018 EPBC referral [Section 4.1]) was presented to DWER. At this time DWER advised the impact of clearing activities, construction and mining operations could be adequately managed under Part V of the EP Act. The expansion footprint was therefore not referred under Part IV of the EP Act to the EPA.

In September 2024, high-level discussions and preliminary footprints of the Wodgina LOM options were presented to DWER. DWER advised that no referral would be required for the project provided that MinRes were comfortable that the activities could be effectively managed under Part V of the EP Act and other secondary approvals.

4.2.2 Part V

MARBL currently operates the Project under the following Part V approval instruments:

- Licence L4328/1989/10
- Works Approval W6734/2022/1

An amendment to L4328/1989/10 will be required to undertake the proposed activities in full, with this amendment planned for submission to DWER in early to mid-2025.

4.3 MINING ACT 1978

The *Mining Act 1978* (Mining Act) governs the exploration for and production of minerals and requires all mining activities to be undertaken in accordance with a Mining Proposal (MP) and Mine Closure Plan (MCP) approved by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS).

The Project currently operates under a Mining Proposal and Mine Closure Plan (DEMIRS Reg ID 122942), with the clearing required to enable the scope of the MP approved under the current CPS-10346/1.

A revision to the Reg ID 122942 MP and MCP is required to align with the scope of this Purpose Permit application, with the MP revision planned to be submitted in Quarter 1 2025.

4.4 BIODIVERSITY CONSERVATION ACT 2016

The *Biodiversity Conservation Act 2016* (BC Act) and Biodiversity Conservation Regulations 2018 provide protection for biodiversity, particularly threatened species and threatened ecological communities (TECs).

The Minister for Environment may list a species or ecological community as threatened under the BC Act. This gives special protection to the threatened species or TEC. Activities that directly or indirectly cause the take or disturbance of listed threatened species (flora and fauna) require a Ministerial authorisation under section 40 of the BC Act.

Clearing activities outlined in this proposal that will cause the take or disturbance of a listed threatened species will be undertaken in accordance with the relevant approvals under the BC Act.

5. STAKEHOLDER CONSULTATION

MARBL's objective for stakeholder consultation in relation to its operations is to ensure that all identified stakeholders, who may be affected by implementation of our various Projects have been appropriately consulted, and that their input has been considered with respect to key operational aspects, including the development of mine closure strategies and defining of Post Mining Land Uses (PMLUs).

The stakeholder strategy is targeted at different stakeholder groups identified as of the Project which comprise:

- **Traditional Owners:** Kariyarra Aboriginal Corporation representing the Kariyarra Native Title Holders, and Nyamal Aboriginal Corporation representing the Nyamal Native Title Holders.
- **Local Community/Land Users:** Pastoral Leaseholders (Kangan Pastoral Station, Wallareenya Pastoral Station, Indee Pastoral Station and Mundabullangana Pastoral Station).
- **State Government:** DEMIRS, DWER, Department of Biodiversity, Conservation and Attractions (DBCA), DPLH, Main Roads Western Australia (MRWA), Department of Planning, Lands and Heritage (DPLH) and Department of Health (DoH).
- **Local Government and Industry Organisations:** Town of Port Hedland, Pilbara Ports Authority, Shire of East Pilbara, Civil Aviation Safety Authority and Airservices Australia.
- **Mining Companies:** Atlas, GAMW
- **Internal Stakeholders:** Shareholders, employees and their families, caretakers, Corporate/Senior Management and consultants/contractors.

5.1 ABORIGINAL HERITAGE AND CULTURAL VALUES

MinRes engage with Prescribed Body Corporates to conduct heritage surveys with Traditional Owners and their chosen heritage professionals. The NVCP permit boundary is situated partially within Kariyarra and Nyamal Native Title Determination areas. Areas of existing disturbance have been subject to archaeological and ethnographic heritage surveys. Any areas not currently surveyed will be completed (archaeologically and ethnographically) prior to any ground clearing activities being undertaken in those areas.

An ACHIS search completed 28 Feb 2025, confirms three (3) Registered Sites and six (6) Lodged Places are situated are situated within the NVCP boundary. In addition, MinRes is managing other in-situ heritage places identified through heritage surveys, all of which will be avoided by the proposed activities undertaken under this approval. MinRes are aware of its obligations under the Aboriginal Heritage Act (1972) and will be managing all activities being undertaken subject to the approval of this NVCP to avoid all known heritage Sites and Places. The details of these are provided in Table 7 and shown in Figure 8.

MinRes manage all activities under our Land Activity Permitting (LAP) system. All activities (ground disturbing and non-ground disturbing) require an approved LAP prior to work commencing. LAPs are assessed and approved by the mine site personnel, and Land Access, Heritage, and Environment teams, with management conditions applied to ensure that MinRes complies with all obligations and legislative requirements. All heritage places will be avoided during the activity of clearing of native vegetation. Any requirement for AHA approvals for land within the NVCP boundary will be sought in consultation with the Traditional Owner Group, RNTBC, and the nominated Committee. These consultations will relate to purposes associated with different environmental approvals, such as mining proposals or program of work applications, and not solely for the purpose of clearing vegetation.

Table 7: Aboriginal Heritage Sites

ID Number	Site Name	Tenement Location	Place Type	Restrictions	DPLH Site Type
6871	MT TINSTONE		Artefacts Scatter, Camp, Rock Shelter, Other and Subsurface Cultural Material	No Gender / Initiation Restrictions	Registered Site
9009	GULINDJINA YAMBARA	M45/50, M45/381, M45/383, M45/923, M45/254, M45/365, L45/58,	Camp; Creation / Dreaming Narrative	No Gender / Initiation Restrictions	Registered Site
22037	WodE#1 Malbarn Caves	M45/50, M45/353, M888, M45/887, M45/353, M45/923, M45/383, M45/924 and M45/365	Creation / Dreaming Narrative; Rock Shelter	No Gender / Initiation Restrictions	Lodged Place
22038	WodE#2 Law Ground Site Complex	L45/58, M45/949, M45/50, M45/382	Burial; Camp; Ritual / Ceremonial; Creation / Dreaming Narrative	Men Only	Registered Site
22039	WodE#3 Historical Aboriginal Mining Camp	M45/50, M45/382	Camp, Historical	No Gender / Initiation Restrictions	Lodged Place
22040	WodE#4 Historical Aboriginal Mining Camp	M45/924, M45/888	Camp, Historical, Water Source	No Gender / Initiation Restrictions	Lodged Place
22045	Wodgina A#3		Artefact Scatter	No Gender / Initiation Restrictions	Lodged Place
22046	Wodgina A#4		Artefact Scatter	No Gender / Initiation Restrictions	Lodged Place
28890	W-08-03	M45/923	Artefacts / Scatter	No Gender / Initiation Restrictions	Lodged Place

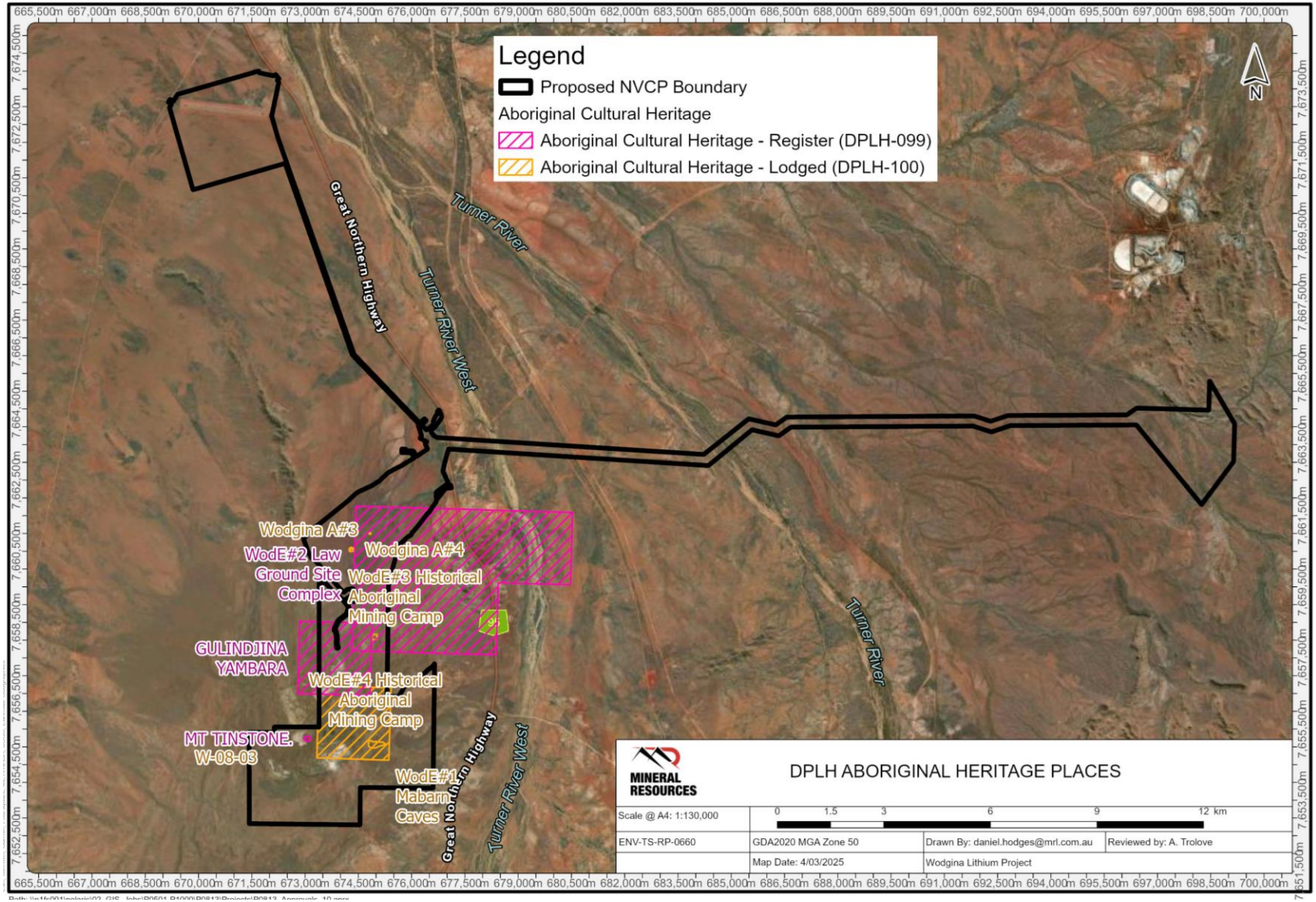


Figure 8: Map of DPLH Aborginal Heritage Places

6. ENVIRONMENTAL SETTING

6.1 CLIMATE

The climate of the area is characterised by hot summers and mild winters with the majority of the rainfall occurring in summer. Climatic information from the nearest Bureau of Meteorology (BOM) meteorological site, Marble Bar (site number 4106) is shown in Figure 9. Since 2000, the Project area has had an average annual maximum temperature of 35.7° and an annual minimum temperature of 20.4°, with the lowest average minimum temperature of 12.3° being recorded in July and the highest average maximum temperature of 42° being recorded in December. Rainfall data collected from Marble Bar station 4106 shows an annual rainfall average of 399.9 mm (Bureau of Meteorlogy , 2023).

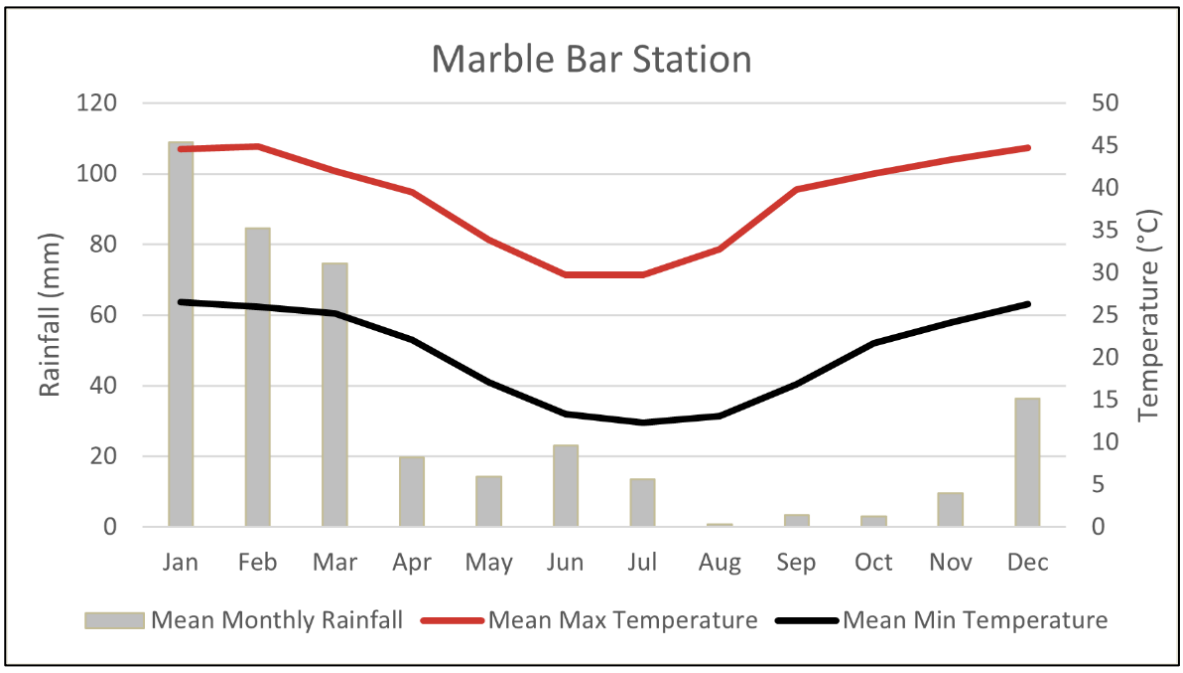


Figure 9: Climate Data from Marble Bar Station (4106)

6.2 GEOLOGY

The Project is located within the Pilbara Craton at the edge of the Mount Bruce Supergroup and consists of a thin cover of weathered Cenozoic sedimentary and metasedimentary regolith over the (northern) Carlindi and (southern) Yule granitoid complexes. These complexes consist of intrusive, sheared intrusive or tectonic contacts with surrounding metamorphic greenstones. The two are separated by the Wodgina Greenstone Belt. The granitic rocks were subsequently intruded by younger veins and dykes of quartz and pegmatite, which form the resource body for the Wodgina mine (MBS Environmental, 2019).

6.3 LAND SYSTEMS

The proposed NVCP Permit Area is located within eight Land Systems defined by DPIRD (2022b). The land systems are described in Table 8 and presented in Figure 10.

Table 8: Land Systems within Proposed NVCP Permit Boundary

Land System	Description	Extent within proposed NVCP Permit Area (ha)
Boolgeeda System (280Bg)	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.	795.4
Capricorn System (280Cp)	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.	1372.8
Macroy System (283Mc)	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands.	666.8
Platform System (280Pl)	Dissected slopes and raised plains supporting shrubby hard spinifex grasslands.	721.7
River System (283Ri)	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.	42.1
Rocklea System (280Rk)	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.	224.8
Talga System (280Tl)	Hills and ridges of greenstone and chert and stony plains supporting hard and soft spinifex grasslands.	62.6
Uaroo System(281Ua, 283Ua)	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.	954.7

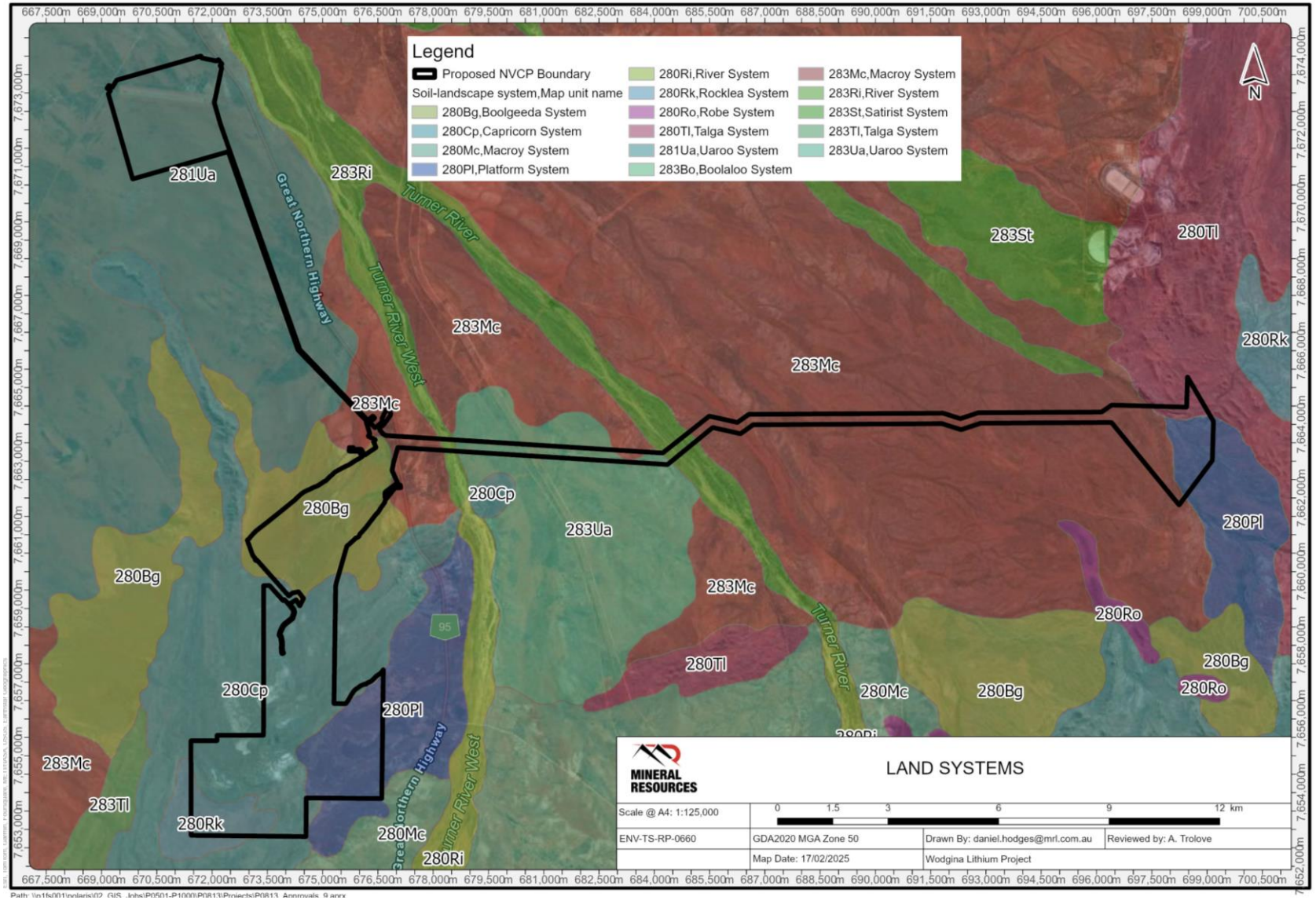


Figure 10: Map of Land Systems

6.4 SOILS

The Project is dominated by loamy and stony calcareous soils associated with hills and ridges, red shallow loam duplex soils on extensive stony sheet washed alluvium plains and areas of bare rock outcrops (MBS, 2019). Areas of material were identified in areas of bare rock outcrop consisting of shallow pockets of loamy topsoil over competent rock suitable for armouring rehabilitation purposes.
MBS (2019) separated soil resources into three categories based on their potential dispersive characteristics. A summary of each soil type and characteristics test results from samples are provided:

- **Loamy Soils** – Soil Groups 507 and 521 – Soils characterised by darker colour and higher iron content with a thin layer of ferruginous gravel lag suitable for flat areas of rehabilitation.
- **Stony Soils** – Soil Group 202 - Predominantly calcareous and with a substantial layer of stony lag material suitable for stable rehabilitation outcomes, underlying weathered oxide bedrock (where suitable) could provide additional rehabilitation resources.
- **Hillslope / Rock Outcrop** – Soil Group 101 – Frequently bare rock outcrops with minimal true 'soil' material however suitable for rock armouring rehabilitation.

6.5 SURFACE WATER

The Project is located on the catchment divide of the Turner River West catchment (to the east of the Project) and Yule River catchment (to the west of the Project). The confluence of the Turner River West and greater Turner River is approximately 9 km downstream (to the north) of the Project.

River and creek systems in the Pilbara generally only flow for a very short duration immediately following larger rainfall events, i.e. potentially limited to events for periods of a few days, predominantly occurring in the wet season (December through to March) with extended periods of no flow through the dry season.

The regional hydrology for the Project is presented in Figure 11.

A Surface Water Assessment, including 2-dimension hydraulic modelling, was undertaken by BG&E Resources Pty Ltd (BG&E) (2025) for the proposed expansions to inform potential environmental risks and mitigation measures for inclusion in an upcoming Mining Proposal revision.

The results of the Surface Water Assessment indicate the generation of sediment is likely to be the largest risk to surface water quality during large rain events. However, the residual risk to downstream environmental receptors is low if mitigation measures such as staged clearing, sediment basins and diversion drains are implemented. The proposed expansion areas and the existing mining footprint do not intercept major drainage lines, and the reduction in total catchment area reporting to the Turner River (<0.1%) is also insignificant. The BG&E (2025) assessment and associated mitigation measures will be included in a Mining Proposal revision.

The 1% Annual Exceedance Probability (AEP) flood mapping for the proposed expansions is presented in Figure 12.

6.6 GROUNDWATER

Groundwater across the northern Pilbara region (the project area) is mainly associated with the following main aquifer systems:

- Moderate to high yielding alluvial and colluvial aquifers associated with major drainage lines (rivers).
- Moderately yielding fractured and mineralised basement aquifers with enhanced secondary permeability and storage.

- Low yielding basement aquifers with a low degree of fracturing, low permeability and low storage.

The groundwater flow is typically northwards, down the hydraulic gradient of major alluvial channels towards the coastal plain. Diffuse recharge to the regional groundwater system occurs at very low rates occurring preferentially during rainfall-runoff events along the major creeks and other areas of surface water concentration/inundation (AQ2 Pty Ltd, 2022).

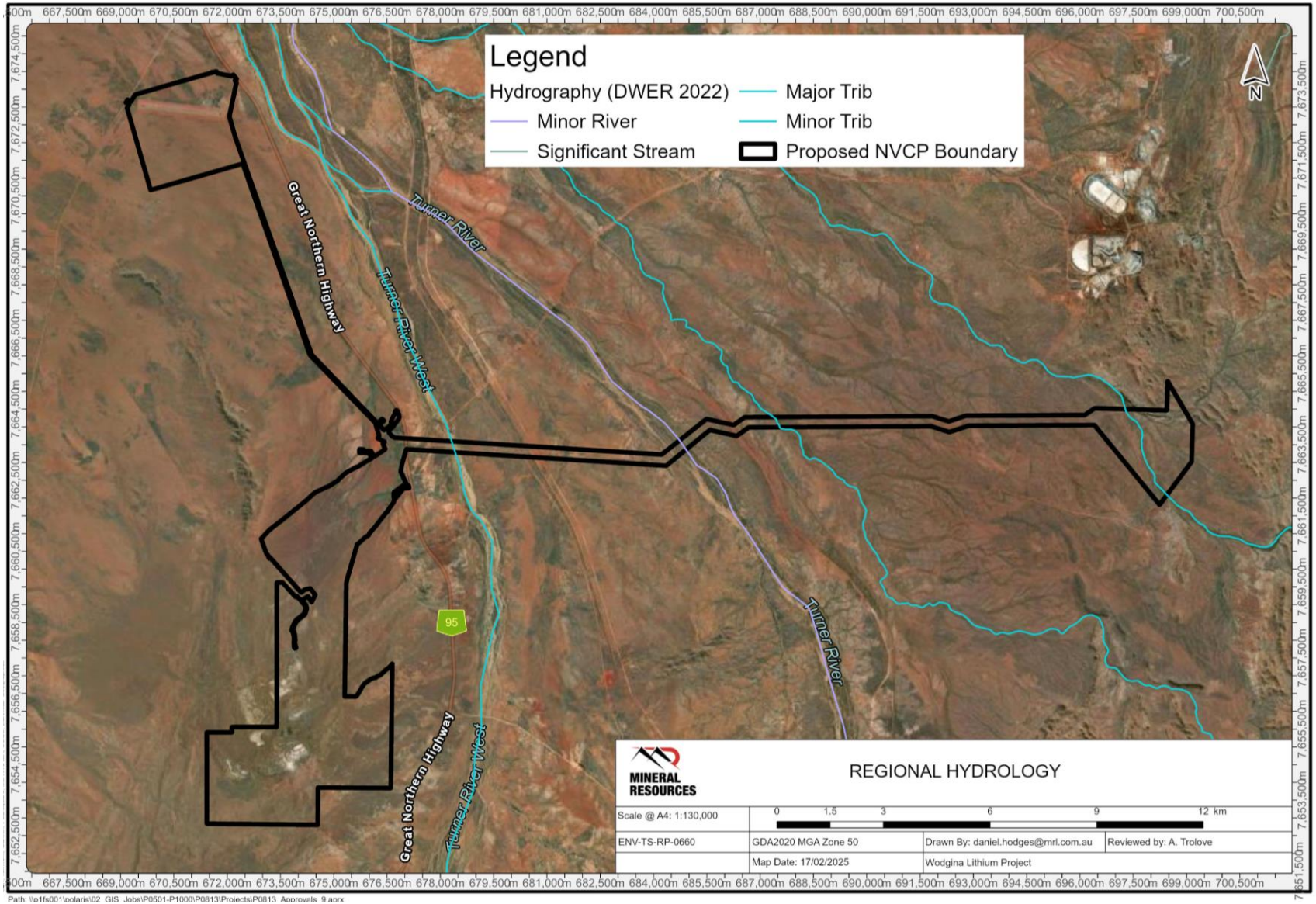


Figure 11: Map of Regional Hydrology

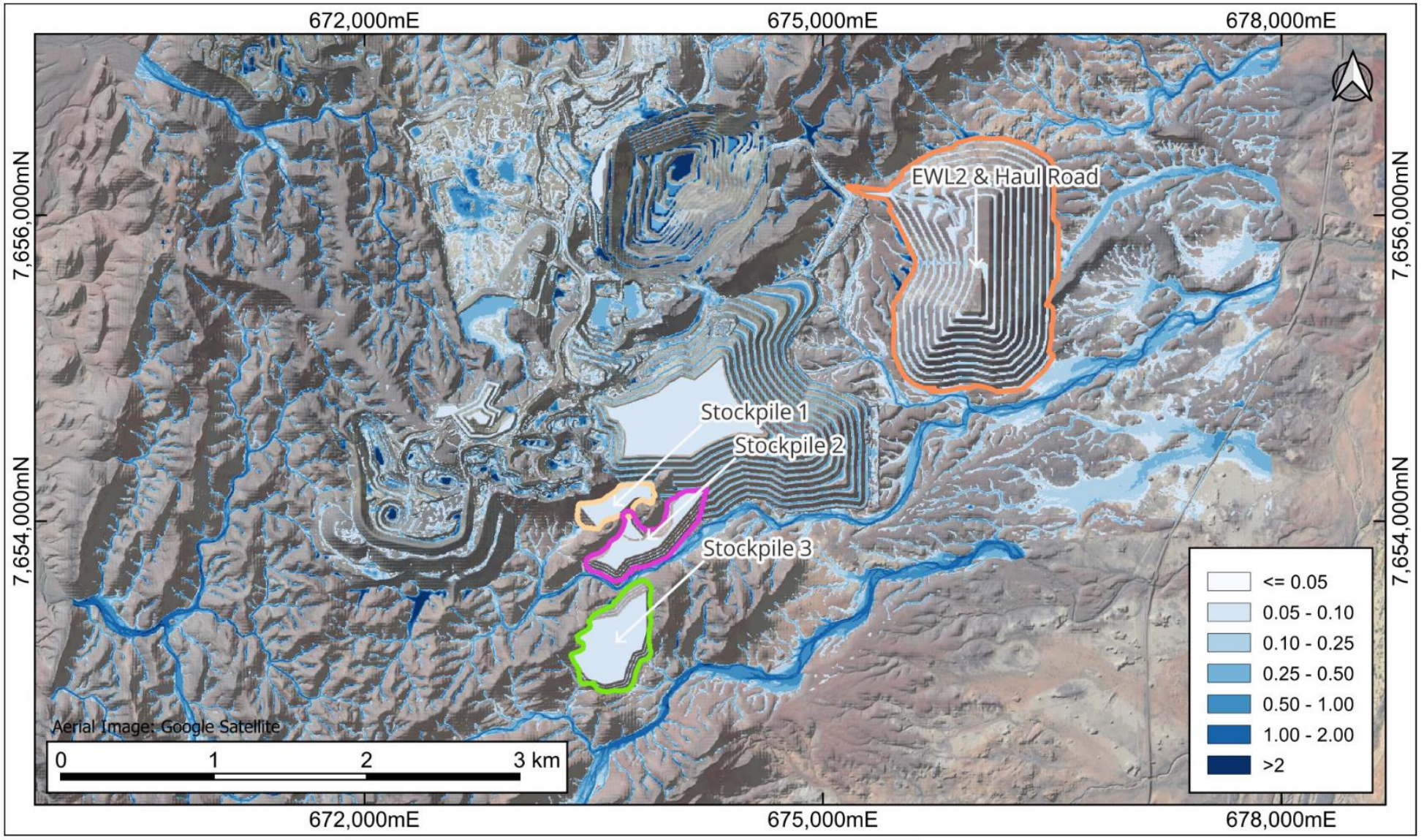


Figure 12: Flood Mapping under 1% AEP Scenario

7. FLORA AND VEGETATION

Umwelt (Australia) Pty. Ltd (Umwelt) was commissioned by MinRes to undertake baseline flora and vegetation surveys for the Wodgina expansion areas in 2023 and 2024. The 2024 survey report (Umwelt, 2025) includes the results of the 2023 survey. The purpose of this survey was to document and present key environmental values in respect to flora and vegetation assemblages in accordance with State and Commonwealth regulatory assessment requirements.

The 2024 flora and vegetation survey involved a detailed survey as defined in Section 4.3 of the Technical Guidance for flora and vegetation surveys (EPA, 2016b). In addition, the 2023 surveys of the 2023 Detailed and Reconnaissance Survey Areas involved a detailed and targeted survey, and reconnaissance and targeted survey, respectively, as defined in Sections 4.1 and 4.2 of the relevant Technical Guidance (EPA, 2016b); however, targeted survey was undertaken in specific parts of 2023 Detailed Survey Area only. The majority of proposed disturbance of this application is within areas subject to targeted flora survey.

The surveys were undertaken to characterise flora and vegetation values of the survey area to the current regulatory standard. The survey scope was to compile an inventory of vascular flora taxa, opportunistically search for and identify any significant flora taxa, describe vegetation types, identify potential groundwater dependant vegetation (GDV), identify locations of any Weeds of National Significance (WoNS), map and describe significant vegetation within the survey area.

The Flora and Vegetation Assessment report (Umwelt, 2025) is provided as Appendix D.

7.1 DESKTOP ASSESSMENT

A desktop assessment, comprising database searches and literature review, was undertaken prior to the flora and vegetation field surveys to gather contextual information on the Study Area and to inform a likelihood of occurrence for significant flora and vegetation to occur within the Study Area. Database searches were conducted to generate a list of vascular flora and vegetation communities of conservation significance and introduced species.

A total of 24 significant vascular taxa were recorded during the desktop assessment within the study area, with one species (*Quoya zonalis*) listed as Threatened under BC Act 2016 and EPBC Act.

Eighteen introduced flora taxa were recorded during the desktop assessment, three of which are listed as Declared Pests under the *Biosecurity and Agriculture Management Act 2007* (BAM Act), with two being declared as Weeds of National Significance (WoNS) (Weeds Australia, 2024), whilst *Cenchrus ciliaris* is not a Declared Pest or WoNS, it is known to be widespread and common in the Pilbara.

The interrogation of the DBCA TEC and PEC database returned one listed significant vegetation community, Gregory Land System PEC (P3). The survey area is located in the Pilbara IBRA region and is known for groundwater dependent vegetation (GDV) to occur, according to the Bureau of Meteorology 'Groundwater Dependent Ecosystem Atlas' (BoM, 2024b), the survey area intersects one Moderate potential aquatic GDE, Turner River. No TECs were returned from the search. The search of the DCCEEW SPRAT database with regard to MNES listed under the EPBC Act (DCCEEW, 2024) did not identify any TECs as occurring or potentially occurring within the Desktop Study Area.

7.2 VEGETATION TYPES

A total of 16 vegetation type (VT) were defined and mapped within the Survey Area. The VTs defined represent four broad vegetation groups, based on soils and topography (Umwelt, 2025);

- Group 1: Low woodlands and shrublands over hummock and occasionally tussock grasslands on low, undulating to flat plains and minor drainage lines with sandy to clay loams with granite or quartz stones (VTs 1, 2, 3, 4, 5, 6, 7, 8 and 9).
- Group 2: Low woodlands and shrublands over hummock and tussock grassland on clay to sandy loams in major drainage lines (VTs 10 and 11).
- Group 3: Shrublands over hummock grasslands on steep to moderate crests and slopes to stony outwash plains influenced by granite, ironstone and/or dolerite (VTs 12, 13 and 14).
- Group 4: Shrublands over hummock grasslands on low-lying flats, stony plains and minor drainage features with likely saline influence (VTs 15 and 16).

The vegetation types mapped as part of this assessment are shown in Figure 13 and described in Table 9.

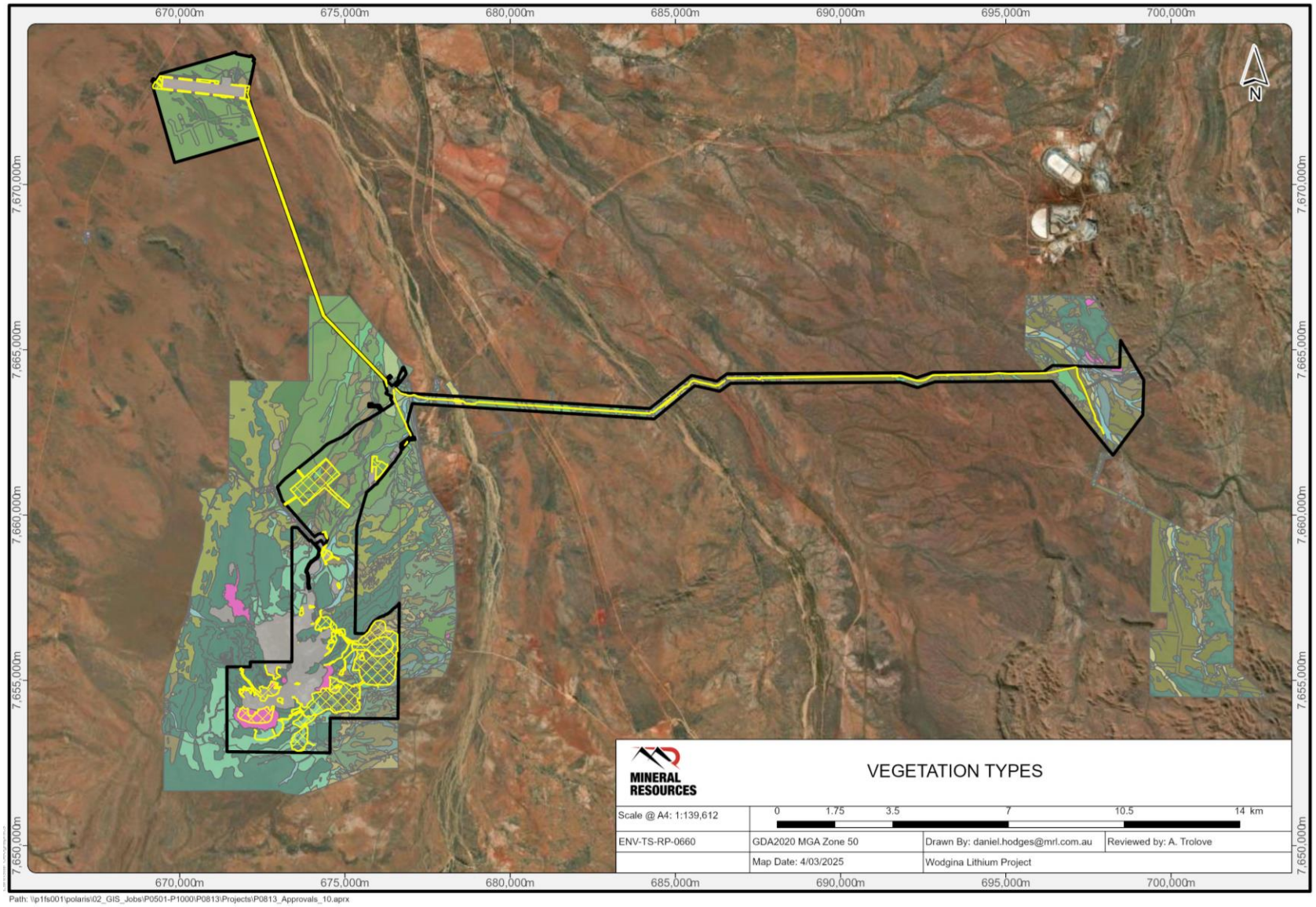


Figure 13: Map of Vegetation Types

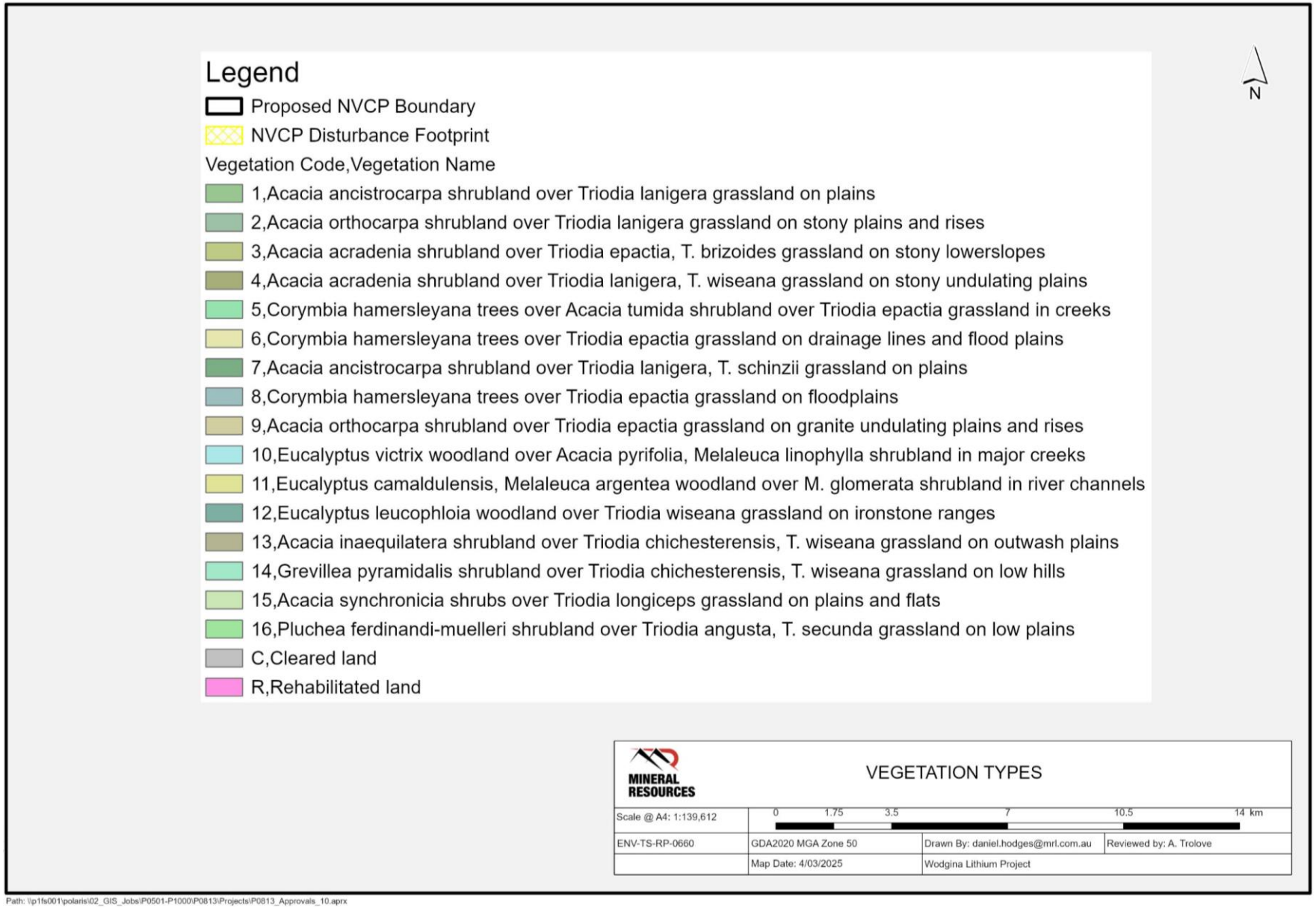

Legend
Proposed NVCP Boundary
NVCP Disturbance Footprint
Vegetation Code,Vegetation Name
1,Acacia ancistrocarpa shrubland over Triodia lanigera grassland on plains
2,Acacia orthocarpa shrubland over Triodia lanigera grassland on stony plains and rises
3,Acacia acradenia shrubland over Triodia epactia, T. brizoides grassland on stony lowerslopes
4,Acacia acradenia shrubland over Triodia lanigera, T. wiseana grassland on stony undulating plains
5,Corymbia hamersleyana trees over Acacia tumida shrubland over Triodia epactia grassland in creeks
6,Corymbia hamersleyana trees over Triodia epactia grassland on drainage lines and flood plains
7,Acacia ancistrocarpa shrubland over Triodia lanigera, T. schinzii grassland on plains
8,Corymbia hamersleyana trees over Triodia epactia grassland on floodplains
9,Acacia orthocarpa shrubland over Triodia epactia grassland on granite undulating plains and rises
10,Eucalyptus victrix woodland over Acacia pyrifolia, Melaleuca linophylla shrubland in major creeks
11,Eucalyptus camaldulensis, Melaleuca argentea woodland over M. glomerata shrubland in river channels
12,Eucalyptus leucophloia woodland over Triodia wiseana grassland on ironstone ranges
13,Acacia inaequilatera shrubland over Triodia chichesterensis, T. wiseana grassland on outwash plains
14,Grevillea pyramidalis shrubland over Triodia chichesterensis, T. wiseana grassland on low hills
15,Acacia synchronicia shrubs over Triodia longiceps grassland on plains and flats
16,Pluchea ferdinandi-muelleri shrubland over Triodia angusta, T. secunda grassland on low plains
C,Cleared land
R,Rehabilitated land
N
MINERAL RESOURCES
VEGETATION TYPES
Scale @ A4: 1:139,612
0 1.75 3.5 7 10.5 14 km
ENV-TS-RP-0660
GDA2020 MGA Zone 50
Drawn By: daniel.hodges@mrl.com.au
Reviewed by: A. Trolove
Map Date: 4/03/2025
Wodgina Lithium Project
Path: \\p1fs001\polaris\02_GIS_Jobs\P0501-P1000\P0813\Projects\P0813_Approvals_10.aprx

Table 9: Vegetation Type Community Description

VT	Summary	Photograph
1	**Description**: Mid sparse to open shrubland dominated by *Acacia ancistrocarpa* over low sparse shrubland dominated *by Bonamia erecta, Ptilotus astrolasius* and *Ptilotus calostachyus* over mid hummock grassland of *Triodia lanigera* on red-brown sandy loam or sandy clay, often with quartz or ironstone stones, on plains. **Location**: Mapped on stony plains throughout the central to north-western extent of the Survey Area **Area mapped**: 2,280 ha (17.3 % of Survey Area) **Sampling**: 47 quadrats **Average Taxon Richness per Quadrat**: 14.0 ± 4.9 **Indicator Taxa**: *Acacia ancistrocarpa, Corymbia zygophylla* **Significant Taxa**: *Euphorbia clementii* (P3) (preferred habitat*), Euploca mutica* (P3) (preferred habitat), *Polymeria sp.*(potentially undescribed), *Triodia chichesterensis* (P3) (preferred habitat) **Variation and Similar VTs**: Occasionally there were isolated trees of *Corymbia zygophylla* or *Corymbia hamersleyana* (Photo 5.13). A lower stratum of *Acacia stellaticeps* was present in some instances. *Triodia lanigera* dominated almost all occurrences; however occasionally *Triodia epactia* was co-dominant. Floristically, VT 1 is most similar to VT 2; VT 1 most obviously differs in the absence of *Acacia orthocarpa* in the tall shrub stratum. VT 7 is also similar; however, VT 7 has higher taxon diversity, particularly low shrubs.	 **VT 1 (Quadrat WOK16)**  **VT 1 variant with Corymbia zygophylla /Corymbia hamersleyana tree stratum (Quadrat WOD37)**

VT	Summary	Photograph
2	**Description**: Tall open to sparse shrubland dominated by *Acacia orthocarpa, Acacia ancistrocarpa* and *Acacia acradenia* over low sparse shrubland of mixed species including Goodenia stobbsiana *and Ptilotus astrolasius* over low hummock grassland dominated by *Triodia lanigera* and occasionally *Triodia epactia* onred-brown clay loam with granite, quartz or ironstone stones on colluvial stone plains and low flat-topped rises. **Location**: Mapped on stony plains and low rises in the western extent of the Survey Area adjacent to Wodgina minesite **Area mapped**: 787.8 ha (6.0 % of Survey Area) **Sampling**: 27 quadrats **Average Taxon Richness per Quadrat**: 15.5 ± 4.8 **Indicator Taxa**: *Acacia spondylophylla, Bonamia pilbarensis, Codonocarpus cotinifolius, Goodenia stobbsiana, Triodia lanigera* **Significant Taxa**: *Euphorbia clementii (P3), Euploca mutica (P3), Goodenia obscurata (P3), Triodia chichesterensis (P3)* **Variation and Similar VTs**: The Acacia-dominated overstorey component was variable, ranging from comprising a relatively minor component (see Photo 5.15), to being more dominant (see Photo 5.14). *Acacia orthocarpa* and *A. ancistrocarpa* rarely co-dominated in any quadrat. *Triodia lanigera* was almost always dominant in the hummock grassland stratum, however occasionally *Triodia epactia*, and rarely *Triodia chichesterensis,* dominated or co-dominated. VT 2 is considered to be most similar to VT 1, see under that VT for discussion.	 **VT 2 (Quadrat WD69)**  **VT 2 (Quadrat WDK07)**

VT	Summary	Photograph
3	**Description**: Tall to mid sparse shrubland of mixed species dominated by *Acacia acradenia*, *Acacia inaequilatera* and *Grevillea wickhamii subsp. hispidula* over low sparse shrubland of mixed species including *Indigofera monophylla* and *Goodenia stobbsiana* over low hummock grassland dominated by *Triodia epactia* and/or *Triodia brizoides* 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. **Location**: Mapped on lower slopes and outwashes predominantly in the western extent of the Survey Area, adjacent to Wodgina minesite **Area mapped**: 952.8 ha (7.2 % of Survey Area) **Sampling**: 27 quadrats **Average Taxon Richness per Quadrat**: 16.0 ± 5.3 **Indicator Taxa**: *Acacia acradenia, Triodia brizoides* **Significant Taxa**: *Euphorbia clementii* (P3) (preferred habitat), *Terminalia supranitifolia* (P3), *Triodia chichesterensis* (P3), *Vigna triodiophila* (P3) **Variation and Similar VTs**: The *Acacia*-dominated overstorey component was variable, ranging from comprising a relatively minor component, to being prominent. *Acacia acradenia* was almost always present and almost always dominant or co-dominant, however *Acacia tumida var. pilbarensis* was dominant at some locations. *Triodia epactia* was almost always dominant or co-dominant in the hummock grassland stratum, with *Triodia brizoides* often co-dominant or dominant; rarely, *Triodia lanigera* or *Triodia wiseana* dominated or co-dominated. VT 3 is considered to be most similar to VT 4. VT 4 differs in that it generally occurs on undulating plains rather than lower slopes, is generally dominated by *Triodia lanigera* and/or *Triodia wiseana* in the hummock grassland stratum, and also tends to be more species poor. VT 3 also has a greater diversity of species in the mid and low shrubland stratums.	 **VT 3 (Quadrat HER066)**  **VT 3 (Quadrat WD32)**

VT	Summary	Photograph
4	**Description**: Tall to mid sparse shrubland dominated by *Acacia acradenia* and *Acacia ancistrocarpa* over low sparse shrubland dominated by *Acacia ptychophylla* and/or *Acacia stellaticeps* over low hummock grassland dominated by Triodia lanigera and *Triodia wiseana*, often with *Triodia epactia* on red-brown clayloam stony undulating plains and outwashes of ranges. **Location**: Mapped on stony undulating plains and outwashes of ranges in the eastern extent of the Survey Area **Area mapped**: 1,307.4 ha (9.9 % Survey Area) **Sampling**: 26 quadrats **Average Taxon Richness per Quadrat**: 11.7 ± 4.2 **Indicator Taxa**: *Acacia ptychophylla* **Significant Taxa**: *Triodia basitricha* (P3), *Triodia chichesterensis* (P3). **Variation and Similar VTs**: This VT was relatively consistent; however, the lower stratum of *Acacia ptychophylla / Acacia stellaticeps* were absent in some areas. VT 4 is considered to be most similar to VT 3, see under that VT for discussion.	 **VT 4 (Quadrat WOJ08)**  **VT 4 Variation with *Acacia ptychophylla / Acacia stellaticeps* stratum absent (Quadrat WOD16)**

VT	Summary	Photograph
5	**Description**: Low isolated trees of *Corymbia hamersleyana* over tall open to sparse shrubland dominated by *Acacia tumida var. pilbarensis*, *Acacia ancistrocarpa* and *Acacia acradenia* over low open to sparse shrubland of mixed species including *Bonamia erecta, Corchorus parviflorus* and *Indigofera monophyla* over low hummock and tussock grassland dominated by *Chrysopogon fallax*, *Triodia epactia* and occasionally *Triodia lanigera* on red, brown or red-brown sandy or clay loam with colluvial stones in minor drainage features including flats and small creeks. **Location**: Mapped in minor drainage features in the western and eastern extent of the Survey Area **Area mapped**: 431.9 ha (3.3 % of Survey Area) **Sampling**: 37 quadrats **Average Taxon Richness per Quadrat**: 35.6 ± 13.7 **Indicator Taxa**: *Aristida holathera var. holathera, Chrysopogon fallax, Corymbia hamersleyana, Hibiscus sturtii var. campylochlamys, Isotropis atropurpurea, Neurachne muelleri, Seringia nephrosperma* **Significant Taxa**: *Euphorbia clementii* (P3) (preferred habitat), Goodenia obscurata (P3), *Polymeria sp.*(potentially undescribed), *Triodia basitricha* (P3), *Triodia chichesterensis* (P3) **Variation and Similar VTs:** The tree and tall shrub strata were relatively consistent compositionally, however structurally the tall shrub stratum was quite variable; this appears to be related to the amount of drainage water the areas receive, with the shrubland generally densest at the wettest sites (Photo 5.21). This was also the case for the low shrub stratum; however, this stratum varied greatly in composition and was generally not dominated by any one taxon. The lower stratum was also relatively variable; often it was dominated by *Triodia epactia*, or more rarely *Triodia lanigera*; however, tussock grasses such as *Chrysopogon fallax* were also occasionally co-dominant and rarely dominant. VT 5 is most similar to VT 6, with VT 6 occurring in alluvial floodout zones only in the eastern extent of the Survey Area. VT 5 is also more species rich, particularly for the wetter sites, and the shrub strata differ in composition.	 **VT 5 (Quadrat WOE23)**  **VT 5 1 Variation with dense shrubland stratum (Quadrat WOC05)**

VT	Summary	Photograph
6	**Description**: Low isolated trees of *Corymbia hamersleyana* over tall sparse to open shrubland of *Acacia tumida var. pilbarensis*, *Acacia acradenia*, *Grevillea wickhamii subsp. hispidula* and *Acacia pyrifolia var. pyrifolia* over low sparse shrubland of mixed species including *Tephrosia rosea var. clementii*, *Indigofera monophylla* and *Corchorus lasiocarpus subsp. lasiocarpus* over mid sparse to open hummock grassland of *Triodia epactia* on brown or red-brown sandy loam or clay loam on stony drainage lines and flood plains **Location**: Mapped in floodout zones in the central to eastern extent of the Survey Area **Area mapped**: 117.5 ha (0.9 % of Survey Area) **Sampling**: 11 quadrats **Average Taxon Richness per Quadrat**: 30.5 ± 6.8 **Indicator Taxa**: *Acacia adoxa var. adoxa, Corchorus laniflorus, Corchorus lasiocarpus subsp. lasiocarpus, Gossypium robinsonii, Grevillea wickhamii / Grevillea wickhamii subsp. hispidula / Grevillea wickhamii subsp. macrodonta, Indigofera monophylla, Pentalepis trichodesmoides subsp. trichodesmoides, Petalostylis labicheoides, Tephrosia rosea var. clementii, Trigastrotheca molluginea, Waltheria virgata* **Significant Taxa:** *Polymeria sp.*(potentially undescribed) **Variation and Similar VTs:** The tree and tall shrub strata were relatively consistent compositionally. The tall shrub stratum and lower shrub stratum was quite variable depending on the amount of water the areas receive (Photo 5.23), although the low shrub stratum varied in species composition (as per VT 5). The lower stratum was generally dominated by *Triodia epactia*; however, in some cases *Triodia lanigera* was dominant. *Chrysopogon fallax* was also occasionally co-dominant in the wetter sites. VT 6 is considered to be most similar to VT 5, see under that VT for discussion.	 **VT 6 (Quadrat WOD15)**  **VT 6 Variation with dense shrubland stratum (Quadrat WOK17)**

VT	Summary	Photograph
7	**Description**: Tall to mid open to sparse shrubland dominated by *Acacia ancistrocarpa* and occasionally Acacia tumida var. *pilbarensis*, *Acacia inaequilatera* and *Grevillea wickhamii subsp. hispidula* over low sparse shrubland of mixed species including by *Bonamia erecta*, *Indigofera monophylla* and *Ptilotus astrolasius* over low hummock grassland dominated by *Triodia lanigera* and occasionally *Triodia schinzii* and/or *Triodia epactia on* red, brown or red-brown sandy or clay loam, often with quartz or ironstone stones, on plains. **Location**: Mapped on plains in the central to north-western extent of the Survey Area **Area mapped**: 324.9 ha (2.5 % of Survey Area) **Sampling**: 14 quadrats **Average Taxon Richness per Quadrat**: 27.4 ± 11.7 **Indicator Taxa**: *Arivela uncifera*, *Euploca mutica* (P3), *Euploca vestita, Goodenia microptera, Tephrosia sp. Bungaroo Creek* (M.E. Trudgen 11601), *Triodia schinzii* **Significant Taxa:** *Euphorbia clementii* (P3) (preferred habitat), *Euploca mutica* (P3) (preferred habitat), *Triodia chichesterensis* (P3) **Variation and Similar VTs**: Much of the variation was related to the relative stoniness of the occurrence, with some areas predominantly stony, and others completely sandy. An upper stratum of low isolated trees of *Corymbia hamersleyana* was present in some occurrences (Photo 5.25). The tall shrub stratum was generally sparse on sandy sites and open on stony sites, however the composition was quite uniform across most sites. *Triodia lanigera* dominated or co-dominated almost all occurrences, especially occurrences that were stony; occasionally Triodia epactia and/or *Triodia schinzii* dominated, but this was almost always at sandy sites. Floristically similar to VT 8, see under that VT for discussion. Also similar to VT 1 – see under that VT for discussion.	 **VT 7 (Quadrat WOE17)**  **VT 7 Variation with *Corymbia hamersleyan* upper stratum (Quadrat WDD14)**

VT	Summary	Photograph
8	**Description**: Low isolated trees of *Corymbia hamersleyana* over tall isolated shrubs to sparse shrubland of mixed species including *Acacia inaequilatera, Grevillea wickhamii subsp. hispidula* and *Acacia trachycarpa* low sparse to open shrubland of Acacia *stellaticeps* over low open hummock grassland to hummock grassland dominated by *Triodia epactia* and occasionally *Triodia lanigera* on red-brown or orange sandy clay loam on minor drainage lines, drainage line edges and floodplains. **Location**: Mapped on minor drainage lines, drainage line edges and floodplains in the central and eastern extent of the Survey Area and adjacent to the Turner River in the west **Area mapped**: 191.5 ha (1.5 % of Survey Area) **Sampling**: 18 quadrats **Average Taxon Richness per Quadrat**: 31.4 ± 13.7 **Indicator Taxa**: *Acacia sphaerostachya, Acacia stellaticeps, Bonamia alatisemina, Bonamia erecta, Eragrostis eriopoda, Eriachne helmsii, Goodenia forrestii, Hakea lorea subsp. lorea, Panicum australiense var. australiense, Pluchea ferdinandi-muelleri, Pluchea tetranthera* **Significant Taxa**: *Corchorus aff. incanus* (potentially undescribed), Euphorbia clementii (P3), *Euploca mutica*(P3), *Triodia chichesterensis* (P3) **Variation and Similar VTs**: The tall shrub stratum was variable in terms of dominant species and absent in some areas, with the low shrub stratum of *Acacia stellaticeps* also absent in some areas (Photo 5.27). VT 8 is considered to be most similar to VT 7. VT 8 differs in that it generally occurs in minor drainage features or more commonly adjacent to more major drainage lines, and consequently tends to be more species rich, and dominated by *Triodia epactia* in the hummock grassland stratum, and often *Acacia trachycarpa* in the tall shrubland stratum.	 **VT 8 (Quadrat WOJ25)**  **VT 8 Variation with *Acacia stellaticeps* low shrub stratum absent (Quadrat WOJ28)**

VT	Summary	Photograph
9	**Description**: Isolated low trees dominated by *Corymbia hamersleyana* over tall to mid sparse shrubland dominated by *Acacia orthocarpa*, *Grevillea wickhamii subsp. hispidula* and often *Acacia maitlandii* and *Acacia tumida var. pilbarensis* over low sparse shrubland of mixed species including *Corchorus parviflorus, Dampiera candicans, Goodenia stobbsiana, Indigofera monophylla* and *Scaevola browniana subsp. browniana* over low hummock grassland dominated by *Triodia epactia* and occasionally *Triodia brizoides* or *Triodia lanigera* on orange, brown or red-brown sandy or clay loam with granite and quartz stones over granite outcropping on undulating plains or low rises. **Location**: Mapped on undulating plains or low rises in association with granite in the south-western, central and central extent of the Survey Area **Area mapped**: 179.4 ha (1.4 % of Survey Area) **Sampling**: 19 quadrats **Average Taxon Richness per Quadrat**: 35.2 ± 11.6 **Indicator Taxa**: *Acacia maitlandii, Acacia orthocarpa, Aristida contorta, Fimbristylis dichotoma, Scaevola browniana subsp. browniana, Tephrosia virens, Tripogonella loliiformis* **Significant Taxa**: *Euphorbia clementii* (P3), *Triodia chichesterensis* (P3) **Variation and Similar VTs**: Although the tree stratum of *Corymbia hamersleyana* was not consistently present, a consistent tall shrubland stratum was present. *Acacia orthocarpa* and *Grevillea wickhamii subsp. hispidula* were almost always present and co-dominant, with *Acacia maitlandii* and *Acacia tumida var. pilbarensis* also regularly dominating. The low shrub stratum was consistently present but was compositionally variable. Generally, *Triodia epactia* dominated, although other Triodia species occasionally co-dominated. This VT also sometimes had a defined forb stratum that was relatively species-rich, however this was usually only at locations where there was a relatively large amount of granite outcropping. This VT is not especially similar to any other VTs.	 **VT 9 (Quadrat WD85)**  **VT 9 (Quadrat WOE26)**

VT	Summary	Photograph
10	**Description**: Low open woodland to isolated trees dominated by *Eucalyptus victrix* and/or *Corymbia hamersleyana* over tall open to sparse shrubland of mixed species dominated by *Acacia pyrifolia var. pyrifolia*, *Acacia tumida var. pilbarensis* and *Melaleuca linophylla* over mid to low open to sparse shrubland of mixed species including *Cajanus pubescens*, *Indigofera monophylla*, *Tephrosia rosea var. clementii*, *Corchorus parviflorus* and *Jasminum didymum subsp. lineare* over low tussock and hummock grassland to open tussock and hummock grassland of mixed species dominated by *Triodia epactia*, *Cenchrus ciliaris, Chrysopogon fallax, Cymbopogon ambiguus* and *Eriachne tenuiculmis* on red or brown clay or sandy loam, usually with colluvial stones, in major creeks. **Location**: Mapped in major creeks throughout the west and east extent of the Survey Area **Area mapped**: 392.8 ha (3.0 % of Survey Area) **Sampling**: 37 quadrats **Average Taxon Richness per Quadrat**: 45.1 ± 11.3 **Indicator Taxa**: *Abutilon aff. hannii, Acacia pyrifolia var. pyrifolia, Acacia tumida var. pilbarensis, Cajanus cinereus / Cajanus pubescens, Cymbopogon ambiguus, Enneapogon lindleyanus, Eriachne tenuiculmis, Eucalyptus victrix, Gossypium australe, Jasminum didymum subsp. lineare, Nellica maderaspatensis, Paspalidium tabulatum, Polymeria ambigua / Polymeria mollis, Pterocaulon sphacelatum, Rhynchosia minima, Themeda triandra* **Significant Taxa**: *Euphorbia clementii* (P3), *Polymeria sp.* (potentially undescribed), *Ptilotus mollis* (P4), *Terminalia supranitifolia* (P3), *Triodia chichesterensis* (P3), *Vigna triodiophila* (P3) **Variation and Similar VTs**: A tree stratum was almost always present, with Eucalyptus victrix in particular dominating the larger drainage lines, often with *Corymbia hamersleyana*; in smaller drainage lines the latter tended to dominate. Rarely, no trees were present – in particular, drainage lines higher in the ranges had no trees. The tall shrub strata varied in density, however, was compositionally quite consistent, although *Melaleuca linophylla* was often very sparse or absent, and in sandier drainage lines, occasionally *Acacia trachycarpa* co-dominated. The lower shrub stratum was always present but variable in both structure and composition, with no one taxon generally dominating. The grassland stratum was similar, with tussock grasses such as *Chrysopogon fallax*, *Cymbopogon ambiguus* and *Eriachne tenuiculmis* often dominating, sometimes	 **VT 10 (Quadrat WOK01)**  **VT 10 Variation with *Corymbia hamersleyana* dominating upper stratum (Quadrat WOK12)**

VT	Summary	Photograph
	with *Triodia epactia*, although in some cases the latter was very sparse. This VT also occasionally had a diverse forb stratum, generally in larger drainage lines where more water collects. This VT is most floristically most similar to VT 11. VT 11 differs in that it tends to occur in more major channels where sandy soils predominate, with taxa preferring higher water flows more common such as *Eucalyptus camaldulensis subsp. refulgens* and *Melaleuca glomerata*.	
11	**Description**: Mid to low open woodland of *Eucalyptus camaldulensis subsp. refulgens* and *Melaleuca argentea* over tall open shrubland of *Melaleuca glomerata*, *Melaleuca linophylla*, *Acacia trachycarpa* and *Acacia ampliceps* over mid to low open to sparse shrubland, forbland and sedgeland of mixed species including *Crotalaria cunninghamii*, *Cyperus ixiocarpus*, *Afrohybanthus aurantiacus* and *Nellica maderaspatensis* over low sparse hummock grassland of *Triodia epactia* with low tussock grassland of *Cenchrus ciliaris* on orange / light brown sand with colluvial stones in major drainage channels in the Turner River. **Location**: Mapped in major drainage channels within the Turner River in the central extent of the Survey Area **Area mapped**: 34.1 ha (0.3 % of Survey Area) **Sampling**: 4 quadrats **Average Taxon Richness per Quadrat**: 44.8 ± 5.3 **Indicator Taxa**: *Acacia ampliceps, Acacia coriacea subsp. pendens, Acacia trachycarpa, Afrohybanthus aurantiacus, Atalaya hemiglauca, Cassytha filiformis, Corynotheca pungens, Crotalaria cunninghamii, Cucumis variabilis, Cyperus blakeanus, Cyperus ixiocarpus, Cyperus vaginatus, Digitaria brownii, Eragrostis speciosa, Eriachne benthamii, Eriachne obtusa, Eucalyptus camaldulensis subsp. refulgens, Eulalia aurea, Evolvulus alsinoides / Evolvulus alsinoides var. decumbens / Evolvulus alsinoides var. villosicalyx, Flueggea virosa subsp. melanthesoides, Goodenia lamprosperma, Ipomoea muelleri, Melaleuca argentea, Melaleuca glomerata, Melaleuca linophylla, Microstachys chamaelea, Pterocaulon serrulatum var. velutinum, Sorghum plumosum var. plumosum, Stemodia viscosa, Tribulus occidentalis, Vigna lanceolata var. lanceolata* **Significant Taxa**: *Corchorus aff. incanus* (potentially undescribed), *Gymnanthera cunninghamii* (P3) (preferred habitat)	 **VT 11 (Quadrat WOS22)**  **VT 11 Variation with reduced lower stratum (Quadrat WOE04)**

VT	Summary	Photograph
	Variation and Similar VTs: In areas where high water flow volumes appear to occur regularly, the shrubland and hummock grassland strata were reduced to isolated plants or were absent entirely (**Photo 5.33**). In these areas, *Melaleuca argentea* was generally the only tree present in the tree stratum; in areas that apparently do not receive regular water flows, this species was absent and *Eucalyptus camaldulensis* subsp. refulgens was dominant. Occasionally a mid to low sparse tussock grassland, forbland and sedgeland of a variety of taxa, was present. Floristically similar to VT 10, see under that VT for discussion.	
12	**Description**: Low isolated trees of *Eucalyptus leucophloia subsp. leucophloia* and/or *Corymbia hamersleyana* over mid sparse shrubland to isolated shrubs dominated by *Acacia acra*denia, *Acacia inaequilatera* and *Grevillea wickhamii subsp. hispidula* over low sparse shrubland of mixed species including *Corchorus parviflorus*, *Indigofera monophyla* and *Tribulus suberosus* over low hummock grassland dominated by *Triodia wiseana*, *Triodia epactia* and occasionally *Triodia brizoides* on red, brown or redbrown 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. **Location**: Mapped on cliffs, ridges and crests and upper to mid slopes of ranges in the western and eastern extent of the Survey Area. **Area mapped**: 3,004.4 ha (22.8 % of Survey Area) **Sampling**: 115 quadrats **Average Taxon Richness per Quadrat**: 25.0 ± 8.6 **Indicator Taxa**: *Cheilanthes contigua, Cyperus hesperius, Eriachne mucronata, Eucalyptus leucophloia subsp. leucophloia, Euphorbia careyi, Ptilotus incanus, Tribulus macrocarpus, Triumfetta maconochieana, Tribulus suberosus, Triumfetta propinqua* **Significant Taxa:** *Euphorbia clementii* (P3), *Terminalia supranitifolia* (P3) (preferred habitat), *Triodia basitricha* (P3), *Triodia chichesterensis* (P3) (preferred habitat), *Vigna triodiophila* (P3) (preferred habitat) **Variation and Similar VTs**: The upper tree stratum was often absent in this VT. The tall shrubland stratum was usually present, however often only isolated shrub were present, and occasionally these were also absent.	 **VT 12 (Quadrat HER054)**  **VT 12 Variation with tree stratum absent (Quadrat WD27)**

VT	Summary	Photograph
	Acacia acradenia was almost always present when this stratum was present. The hummock grassland was fairly consistently dominated or co-dominated by *Triodia wiseana* and *Triodia epactia*, although *Triodia brizoides* occasionally co-dominated, and rarely dominated. This VT is not especially similar to any other VTs	
13	**Description**: Low open woodland to isolated trees of *Corymbia hamersleyana* over tall to mid sparse shrubland dominated by *Acacia inaequilatera*, *Acacia bivenosa* and *Acacia acradenia* over low hummock grassland dominated by *Triodia chichesterensis* and/or *Triodia wiseana* and occasionally *Triodia angusta* on red, red-brown or light brown clay loam with calcrete, quartz and metamorphosed granite stones, occasionally over calcrete outcropping, on colluvial outwashes of ranges and colluvial stony plains. **Location**: Mapped on colluvial outwashes of ranges and colluvial stony plains predominantly in the central to eastern and south-western extent of the Survey Area **Area mapped**: 1,153.4 ha (8.8 % of Survey Area) **Sampling**: 66 quadrats **Average Taxon Richness per Quadrat**: 17.4 ± 7.1 **Indicator Taxa**: *Acacia bivenosa, Triodia chichesterensis* (P3) **Significant Taxa**: *Euphorbia clementii* (P3), *Euploca mutica* (P3), *Ptilotus mollis* (P4), *Terminalia supranitifolia* (P3), *Triodia chichesterensis* (P3) (preferred habitat) **Variation and Similar VTs**: The tree stratum was often absent in this VT. The tall shrub stratum was relatively variable in composition; although *Acacia bivenosa* and *A. inaequilatera* were usually present, occasionally *Acacia acradenia* or *Acacia orthocarpa* replaced them. *Triodia chichesterensis* was always present and usually dominant, with Triodia wiseana and *Triodia angusta* often co-dominant; rarely the latter species dominated. VT 13 is most floristically similar to VT 14. VT 14 differs in that it lacks the upper tree stratum and also differs in the composition of the tall shrub stratum with VT 14 dominated by *Grevillea pyramidalis subsp. leucadendron* and *Acacia orthocarpa* rather than *Acacia bivenosa* and *Acacia acradenia*. VT 14 also generally occurs in association with granite or dolerite rather than calcrete.	 **VT 13 (Quadrat WDD15)**  **VT 13 Variation with tree stratum absent (Quadrat WOE31)**

VT	Summary	Photograph
14	**Description**: Tall to mid sparse shrubland of mixed species including *Acacia inaequilatera, Grevillea pyramidalis subsp. leucadendron* and *Acacia orthocarpa* over low hummock grassland dominated by *Triodia chichesterensis* and/or *Triodia wiseana* on brown, red or red-brown clay loam with dolerite, calcrete and quartz stones, often with dolerite or granite outcropping, on low hills. **Location**: Mapped on low hills in the south-western extent of the Survey Area, near Wodgina minesite **Area mapped**: 792.9 ha (6.0 % of Survey Area) **Sampling**: 20 quadrats **Average Taxon Richness per Quadrat**: 16.4 ± 6.2 **Indicator Taxa**: *Boerhavia gardneri, Corchorus parviflorus, Cullen leucochaites, Tephrosia sp*. NW Eremaean (S. van Leeuwen et al. PBS 0356), *Triodia wiseana* **Significant Taxa**: *Euphorbia clementii* (P3), *Terminalia supranitifolia* (P3), *Triodia chichesterensis* (P3) (preferred habitat), *Vigna triodiophila* (P3) **Variation and Similar VTs**: The tall shrub stratum was generally very sparse, however on some occasions was absent altogether (Photo 5.39). *Acacia inaequilatera* and *Grevillea pyramidalis subsp. leucadendron* usually dominated this stratum, although occasionally *Acacia orthocarpa* replaced them. *Triodia chichesterensis* was almost always present and usually dominated the hummock grassland stratum or codominated with *Triodia wiseana*, although occasionally *Triodia epactia* dominated. VT 14 is most similar to VT 13, see under that VT for discussion.	 **VT 14 (Quadrat WDM22)**  **VT 14 Variation with tall shrub stratum absent (Quadrat HER035)**

VT	Summary	Photograph
15	**Description**: Mid isolated shrubs of *Acacia synchronicia* over low isolated chenopod shrubs of *Maireana georgei* over mid hummock grassland of *Triodia longiceps* over low sparse forbland, tussock grassland and sedgeland of mixed species including *Portulaca oleracea*, *Ptilotus exaltatus*, *Cynodon prostratus*, *Sporobolus australasicus* and *Fimbristylis dichotoma* on red clay loam with colluvial stones on slightly saline plains and flats. **Location**: Mapped in one low-lying area in the western extent of the Survey Area, north-east of Wodgina minesite **Area mapped**: 65.0 ha (0.5 % of Survey Area) **Sampling**: 5 quadrats **Average Taxon Richness per Quadrat**: 8.8 ± 1.6 **Indicator Taxa**: *Acacia synchronicia, Maireana georgei, Senna glutinosa subsp. glutinosa, Triodia longiceps* **Significant Taxa**: *Triodia chichesterensis* (P3) **Variation and Similar VTs**: *Triodia lanigera* was present in a number of occurrences of this VT; however, dominated only on the rare occasion (Photo 5.41). The mid shrub stratum was fairly consistent; however the low sparse forbland, tussock grassland and sedgeland varied in the taxa present. VT 15 is somewhat floristically similar to VT 16, with both occurring on slightly saline plains and both with *Triodia longiceps* often dominating the hummock grassland stratum. However, VT 16 was more varied in the hummock grassland stratum with *Triodia angusta* and *Triodia secunda* also dominating this stratum, and the low shrub layer was dominated by different taxa.	 **VT 15 (Quadrat WD01)**  **VT 15 Variation with *Triodia lanigera* dominating the hummock grassland stratum (Quadrat WOD39)**

VT	Summary	Photograph
16	**Description**: Low isolated shrubs to sparse shrubland of *Acacia stellaticeps* and *Pluchea ferdinandi-muelleri* over low open hummock grassland to hummock grassland dominated by *Triodia angusta*, *Triodia secunda* and/or *Triodia longiceps* over low sparse forbland and tussock grassland of mixed species including *Trianthema triquetrum*, *Sporobolus australasicus, Eriachne obtusa* and *Calandrinia stagnensis* on redbrown or brown sandy clay on low lying, slightly saline plains. **Location**: Mapped on low lying, slightly saline plains adjacent to the Turner River, in the central extent of the Survey Area **Area mapped**: 31.3 ha (0.2 % of Survey Area) **Sampling**: 11 quadrats (WOE11, WOE12, WOE14, WOE16, WOE18, WOJ10, WOL01, WOS01, WOS04, WOS05, WOS06) **Average Taxon Richness per Quadrat**: 15.8 ± 7.0 **Indicator Taxa**: *Sclerolaena densiflora, Triodia secunda* **Significant Taxa**: *Euploca mutica* (P3) **Variation and Similar VTs**: The hummock grassland stratum was variously dominated by *Triodia angusta*, *Triodia secunda* and *Triodia longiceps*, with *Triodia lanigera* and *Triodia epactia* present in some occurrences but rarely forming a dominant component of the stratum. The low shrub stratum was absent in some occurrences of this VT. VT 16 is most floristically similar to VT 15, see under that VT for discussion.	 **VT 16 - *Triodia secunda* dominant (Quadrat WOS06)**  **VT 16 - *Triodia angusta / Triodia longiceps* dominant (Quadrat WOE18)**

7.3 VEGETATION ASSOCIATION

Four vegetation system associations are mapped within the Desktop Assessment for the proposed NVCP Permit Area. The Project Area lies predominantly within the Abydos Plains within the Chichester sub-region, which is characterised by folded and undulating Archaean granite with basalt plains and ranges. The basalt plains are characterised by hummock grasslands, shrub-steppe, kanji over soft spinifex and *Triodia brizoides*.

The percentage of Pre-European extent of the vegetation association is presented in Table 10. The proposed NVCP Permit Area will not reduce the extent of the regional vegetation association to below the 30% Pre-European extent threshold (EPA, 2008).

Table 10: Vegetation System Associations within the Survey Area

Vegetation System Association	Description	Current Extent (ha)	Pre-European Extent Remaining (%)	Current Extent Protected for Conservation (%)
Abydos Plain – Chichester 93	Hummock grasslands, shrub steppe; kanji over soft spinifex	2,478,504	99.9	0.5
Abydos Plain – Chichester 619	Medium woodland; river gum (*Eucalyptus camaldulensis*)	71,201	99.9	0.3
Abydos Plain – Chichester 626	Hummock grasslands, shrub-steppe; kanji over soft spinifex and *Triodia brizoides*	117,198	99.6	15.6
George Ranges 82	Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*	316,855	99.9	0

7.4 VEGETATION CONDITION

Vegetation of the Flora Area has been mapped for vegetation condition as per the Vegetation Condition Scale adapted from Keighery 1994 and Trudgen 1988.

The majority of the proposed NVCP Permit Area is mapped as 'Excellent' condition, generally free of introduced taxa and no evidence of grazing or other disturbances to vegetation noted. The vegetation occurring in drainage lines was often rated as 'Very Good' or 'Good' or less commonly 'Poor' or 'Degraded' (Umwelt, 2025). The lower condition rating was due to impacts associated with cattle activity in the area, and the presence of weed taxa, particularly *Cenchrus ciliaris* and *Cenchrus setiger*.

Some areas within the northern-eastern part of the Survey Area were subjected to disturbances associated with historical mining activities.

Vegetation condition over the study area is presented in Figure 14 and summarised in Table 11.

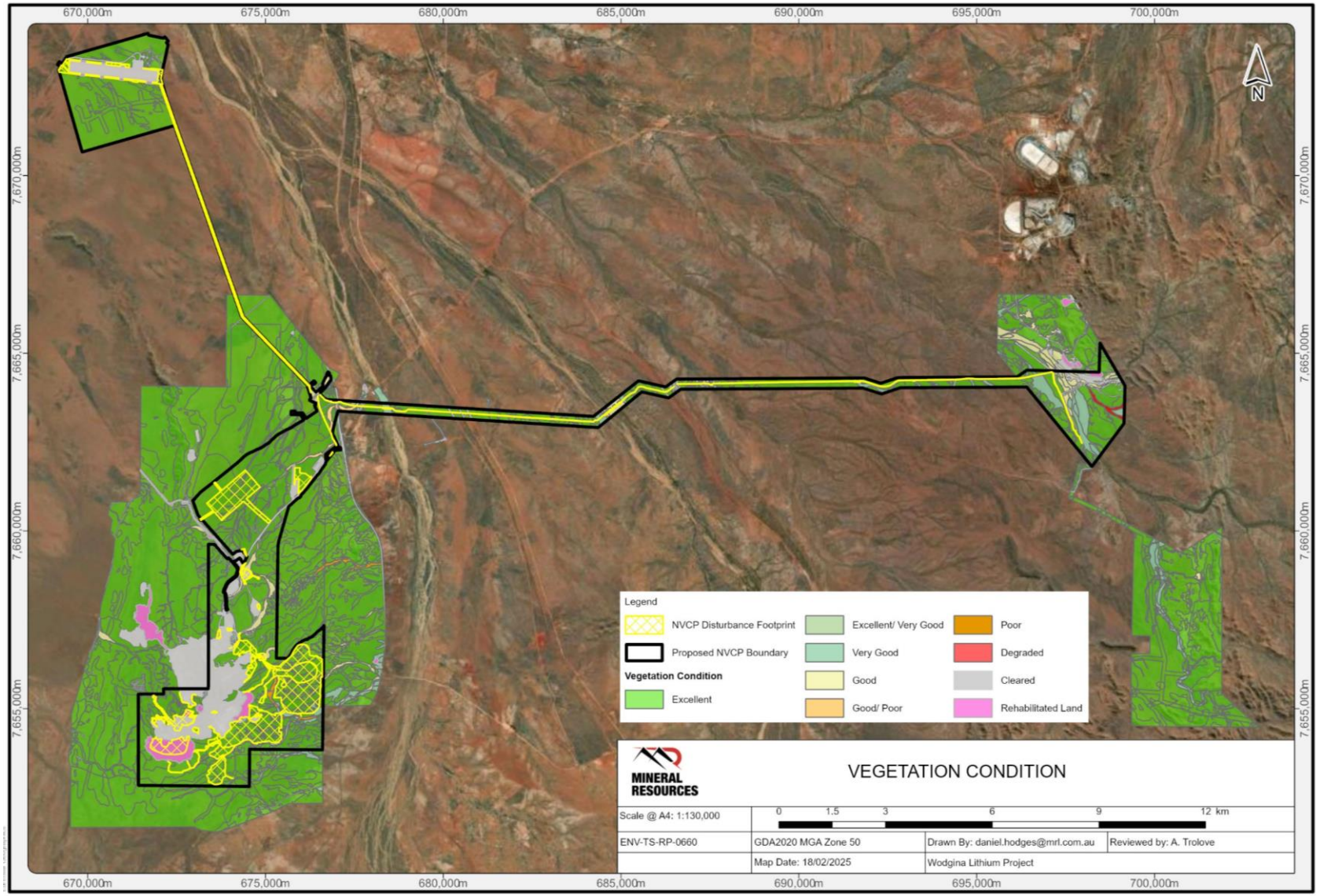


Figure 14: Vegetation Condition

Table 11: Vegetation Condition within the Vegetation Study Area

VT	Area Mapped (ha)								
	Excellent	Excellent/ Very Good	Very Good	Good	Good/ Poor	Poor	Degraded	Condition Rating Not Applicable	Total
1	2256.9	-	5.8	14.6	-	2.6	-	-	2280.0
2	777.5	-	4.5	5.8	-	-	-	-	787.8
3	952.7	-	-	-	-	0.1	-	-	952.8
4	1290.2	-	0.8	16.3	-	-	-	-	1307.3
5	297.1	-	98.2	19.5	-	17.1	-	-	431.9
6	33.8	-	50.6	33.2	-	-	-	-	117.5
7	324.2	-	-	0.1	-	0.6	-	-	324.9
8	72.5	-	113.4	5.4	-	0.2	-	-	191.5
9	174.1	-	5.2	-	-	0.1	-	-	179.4
10	97.4	15.9	80.5	136.8	30.0	16.9	15.4	-	392.8
11	-	-	16.5	17.6	-	-	-	-	34.1
12	2974.2	-	7.6	22.6	-	-	-	-	3004.4
13	1109.8	-	16.5	27.0	-	-	-	-	1153.4
14	789.1	-	3.8	-	-	-	-	-	792.9
15	65.0	-	-	-	-	-	-	-	65.0
16	25.8	-	5.0	0.2	-	0.3	-	-	31.3
R	-	-	-	-	-	-	-	188.1	188.1
C	-	-	-	-	-	-	-	915.8	915.8
Total	**11240.3**	**15.9**	**408.6**	**299.0**	**30.0**	**37.8**	**15.4**	**1103.8**	**13150.9**
Percentage of Survey Area	**85.5**	**0.1**	**3.1**	**2.3**	**0.2**	**0.3**	**0.1**	**8.4**	**100**

7.5 CONSERVATION SIGNIFICANT FLORA

A total of 400 discrete vascular flora taxa (including 14 introduced taxa), two known hybrids (as per WA Herbarium (1998-)) and eight putative hybrids have been recorded within the Survey Area including data from Woodman Environmental (2020) and other previous surveys, 2023 survey and the 2024 survey (Umwelt, 2025). The taxa and hybrids identified, represent 58 families and 156 genera with the most-represented families were Fabaceae (70 taxa; two known hybrids and seven putative hybrids), Poaceae (67 taxa) and Malvaceae (41 taxa). A total of 385 discrete vascular flora taxa (including 12 introduced taxa) and 10 hybrids, representing 55 families and 153 genera, were recorded within the Survey Area during the 2023 and 2024 surveys.

No Threatened flora taxa were recorded within the Survey Area (Umwelt, 2025). A total of 11 significant flora taxa have been recorded within the Survey Area by this current survey and previous surveys, nine of which are Priority flora taxa, with two potentially undescribed taxa recorded during the 2023/2024 survey.

A known (DBCA) location of *Quoya zonalis* (T) approximately 0.2 km north-east of the southern-eastern corner of the Survey Area was verified by the 2023 survey. Although habitat is considered suitable for this taxon was present, the taxon was not located within the survey area during both the 2023 and 2024 surveys.

Umwelt (2025) revisited previously surveyed areas as reported by Woodman Environmental (2020) and confirmed there has likely been little change to the population dynamics of *Terminalia supranitifolia*, *Triodia chichesterensis* and *Vigna triodiophila* (all P3), and that the existing datasets for these taxa remain valid estimates of the distribution and abundance of these taxa in these areas. The population dynamics of *Euphorbia clementii* (P3) have changed in these areas because they have been recently fire-affected; this was also expected. As previously documented by Woodman Environmental (2020), it is not possible to accurately assess the distribution and abundance of this taxon in a given area unless survey is undertaken in the first growing season post-fire. The potential extent and abundance of *Euphorbia clementii*, however, is best assessed via a combination of physical records and suitable habitat extent with both previously and newly recorded data presented by Umwelt (2025).

To support this application, the conservation significant flora dataset includes both the Umwelt (2025) records from the 2023 and 2024 surveys, and the Woodman (2020) and records as this dataset was validated by Umwelt.

The significant flora taxa is described in Table 12 and locations shown in Figure 15.

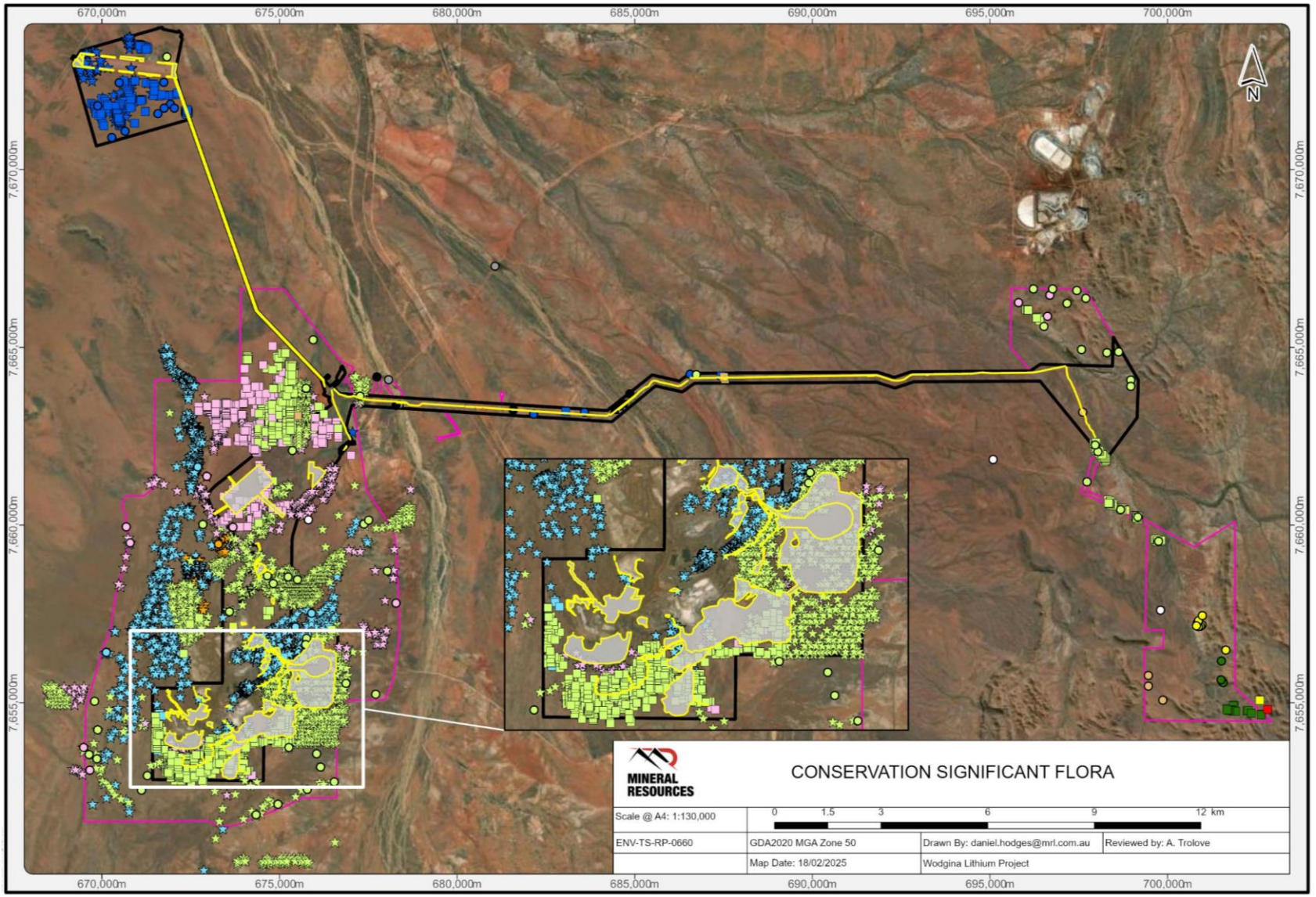


Figure 15: Conservation Significant Flora

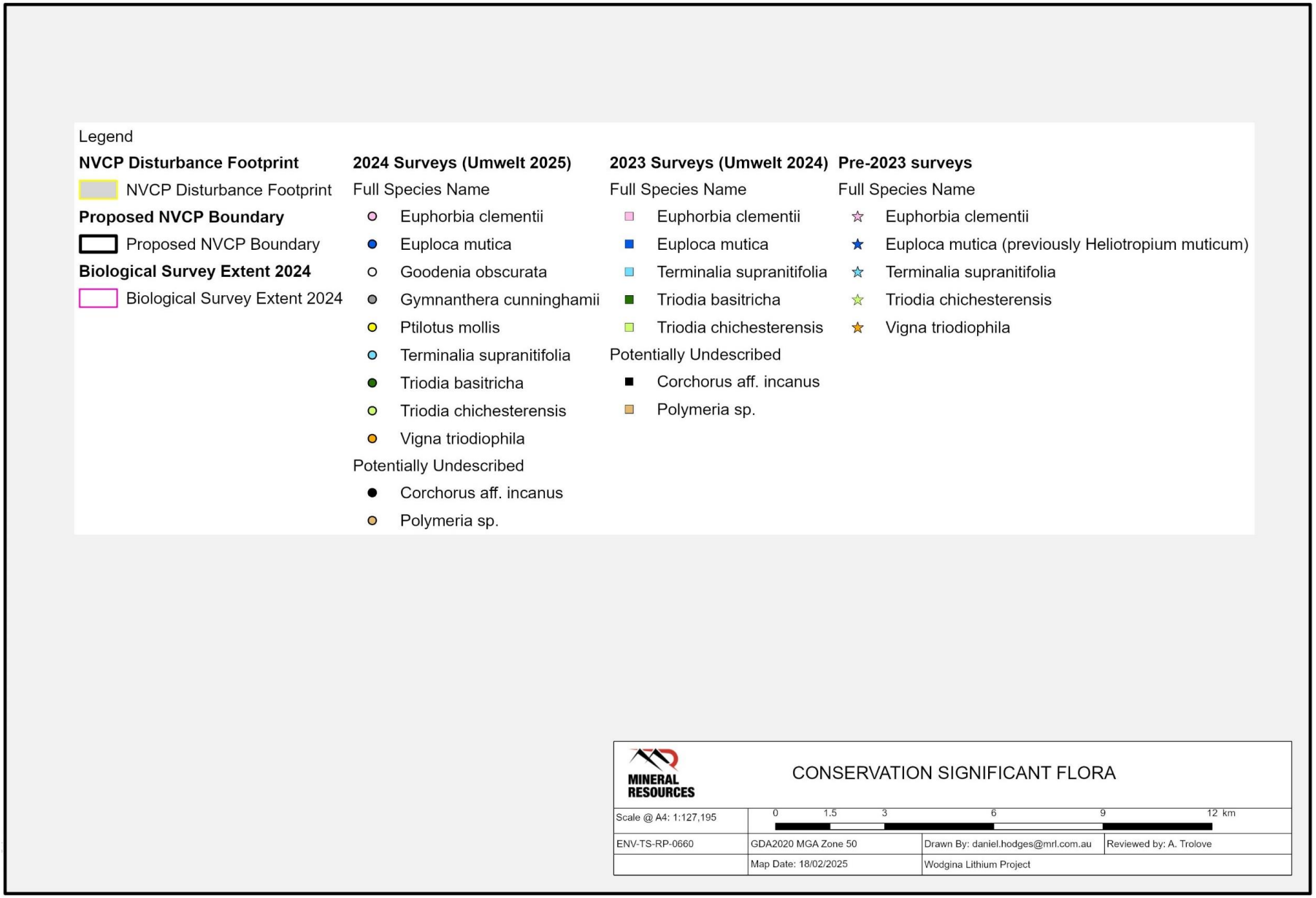

Legend
NVCP Disturbance Footprint
NVCP Disturbance Footprint
Proposed NVCP Boundary
Proposed NVCP Boundary
Biological Survey Extent 2024
Biological Survey Extent 2024
2024 Surveys (Umwelt 2025)
Full Species Name
Euphorbia clementii
Euploca mutica
Goodenia obscurata
Gymnanthera cunninghamii
Ptilotus mollis
Terminalia supranitifolia
Triodia basitricha
Triodia chichesterensis
Vigna triodiophila
Potentially Undescribed
Corchorus aff. incanus
Polymeria sp.
2023 Surveys (Umwelt 2024)
Full Species Name
Euphorbia clementii
Euploca mutica
Terminalia supranitifolia
Triodia basitricha
Triodia chichesterensis
Potentially Undescribed
Corchorus aff. incanus
Polymeria sp.
Pre-2023 surveys
Full Species Name
Euphorbia clementii
Euploca mutica (previously Heliotropium muticum)
Terminalia supranitifolia
Triodia chichesterensis
Vigna triodiophila
MINERAL RESOURCES
CONSERVATION SIGNIFICANT FLORA
Scale @ A4: 1:127,195
0 1.5 3 6 9 12 km
ENV-TS-RP-0660
GDA2020 MGA Zone 50
Drawn By: daniel.hodges@mrl.com.au
Reviewed by: A. Trolove
Map Date: 18/02/2025
Wodgina Lithium Project

Table 12: Summary of Significant Flora Taxa Recorded within the Study Area

Taxon	Status	Number of Locations					Number of Individuals					VTs
		Survey Area		Regional		Overall Total	Survey Area		Regional		Overall Total	
		2023/2024 Survey	Previous Survey	2023/2024 Survey	Previous Survey		2023/2024 Survey	Previous Survey	2023/2024 Survey	Previous Survey		
Corchorus aff. incanus	-	7	-	-	-	7	7	-	-	-	7	8, 11
Euphorbia clementii	P3	328	349	-	27	704	1,841	61,139	-	1,009	63,989	1^, 2, 3^, 5^, 7^, 8, 9, 10, 12, 13, 14
Euploca mutica	P3	158	77	-	-	235	2,655	96	-	-	2,751	1^, 2, 7^, 8, 13, 16
Goodenia obscurata	P3	2	-	1	-	3	27	-	5	-	32	2, 5
Gymnanthera cunninghamii	P3	1	-	2	-	3	1	-	3	-	4	11^
Polymeria sp.	-	11	-	-	-	11	24	-	-	-	24	1, 5, 6, 10
Ptilotus mollis	P4	9	-	1	-	10	316	-	100	-	416	10, 13
Terminalia supranitifolia	P3	9	1,480	-	62	1,542	14	2,803	-	100	2,903	3, 10, 12^, 13, 14
Triodia basitricha	P3	21	-	1	-	22	6,846	-	5,000	-	11,846	4, 5, 12
Triodia chichesterensis	P3	928	1,686	4	214	2,832	725,623	1,634,426	17,060	245,620	2,622,729	1^, 2, 3, 4, 5, 7, 8, 9, 10, 12^, 13^, 14^, 15
Vigna triodiophila	P3	1	169	-	-	169	1	2,482	-	-	2,482	3, 10, 12^, 14

#Includes significant flora data from Woodman Environmental (2020) and historical surveys by other consultancies which have been verified by Umwelt/Woodman Environmental

^Designates preferred habitat, based on proportional location representation and landforms/soils

*The location and number of individuals recorded in 2023/2024 surveys has not been added to the overall total for these taxa, as these locations are re-surveys of previously recorded location

7.6 RIPARIAN AND GROUNDWATER DEPENDENT VEGETATION

A total of five vegetation types mapped in the Survey Area contain riparian vegetation. These vegetation types are listed below (Umwelt, 2025):

- VT 5: mapped in minor drainage features including flats and small ephemeral creeklines. This VT was mainly located in small drainage lines; however, it was also mapped on associated flats. A total of 431.9 ha of VT 5 was mapped in the Survey Area.
- VT 6: mapped in drainage features and on floodplains in the eastern extent of the Survey Area. A total of 117.5 ha of VT 6 was mapped in the Survey Area.
- VT 8: mapped in minor drainage lines, on drainage line edges and on floodplains. This VT was located in the central and eastern extents of the Survey Area and adjacent to the Turner River in the west. A total of 191.5 ha of VT 8 was mapped in the Survey Area.
- VT 10: mapped in major ephemeral creeklines throughout the west and east extents of the Survey Area. A total of 392.8 ha of VT 10 was mapped in the Survey Area.
- VT 11: mapped in channels of the Turner River in the central extent of the Survey Area, with a total of 34.1 ha mapped in the Survey Area.

As such, VTs 5, 6, 8, 10 and 11 are considered to be at least partially or totally dependent on surface water flows for survival.

Two VT mapped within the study area have been identified as containing Groundwater Dependant Vegetation (GDV) based on the presence of phreatophytic species in VT11 and VT10 (Umwelt, 2025). Based on the presence of *Melaleuca argentea* and *Eucalyptus camaldulensis subsp. refulgens*, and the presumed presence of a shallow water table, VT 11 is likely dependent on groundwater. Some occurrences within VT10 containing *Eucalyptus camaldulensis subsp. refulgens*, it is possible that such is also groundwater dependent, if the local water table is within reach of the root system (generally within 10m of the ground surface) (Umwelt, 2025). It should be noted that depth to groundwater within elevated parts of Wodgina (main range) is generally at least 20 m from the surface (Golder, 2018), and therefore would not be accessible to any occurrences of VT 10 in these areas.

7.7 INTRODUCED FLORA

A total of 15 introduced flora species have been identified during the 2023/2024 flora surveys (Umwelt, 2025) and previous surveys (Woodman Environmental, 2020). These species include:

- *Aerva javanica* (Kapok Bush);
- *Calotropis procera* (Calotrope);
- *Cenchrus ciliaris* (Buffel Grass);
- *Cenchrus setiger* (Birdwood Grass);
- *Chloris barbata* (Purpletop Chloris);
- *Cynodon dactylon* (Couch);
- *Digitaria ciliaris* (Crabgrass);
- *Eragrostis minor* (Smaller Stinkgrass);
- *Flaveria trinervia* (Speedy Weed);
- *Malvastrum americanum* (Spiked Malvastrum);
- *Opuntia sp.* (Prickly Pears);
- *Passiflora foetida var. hispida* (Stinking Passion Flower);
- *Physalis angulata* (Wild Gooseberry);

- *Trianthema portulacastrum* (Giant Pigweed);
- *Tribulus terrestris* (Caltrop).

Only two of these species, *Calotropis procera* (Calotrope) and *Opuntia sp.* (Common Prickly Pear) are Declared Pests under the BAM Act. *Opuntia species* (Common Prickly Pear) is also WoNS (Weeds Australia, 2024). The locations of these species are presented in Figure 16.

Some locations of Calotrope and Common Prickly Pear occur within or near the proposed Disturbance Footprint. To ensure these occurrences are controlled to prevent further spread, the following will be implemented:

- Records of Declared Pests will be included in the MinRes internal constraints shapefile layer, which is assessed during the LAP assessment phase (Section 2.3).
- Prior to any clearing activities which will disturb these individuals, weed management will be undertaken to eradicate any occurrences to prevent further spread.
- Should the topsoil nearby these (or other identified) individuals be impacted by seeds, this material will be considered contaminated and be encapsulated within a Waste Rock Landform. This may be completed by disposing of waste rock directly over this topsoil should the landform be a permanent feature as per an approved Mine Closure Plan.

MinRes undertakes other weed management activities as per commitments of an approved Mining Proposal (Reg ID 122942), which includes:

- Vehicles and equipment cleaned, inspected and issued with a Weed Hygiene Certificate prior to entry to site or moving between areas on site.
- Vehicles and equipment restricted to roads and tracks.
- Annual weed survey and control program.

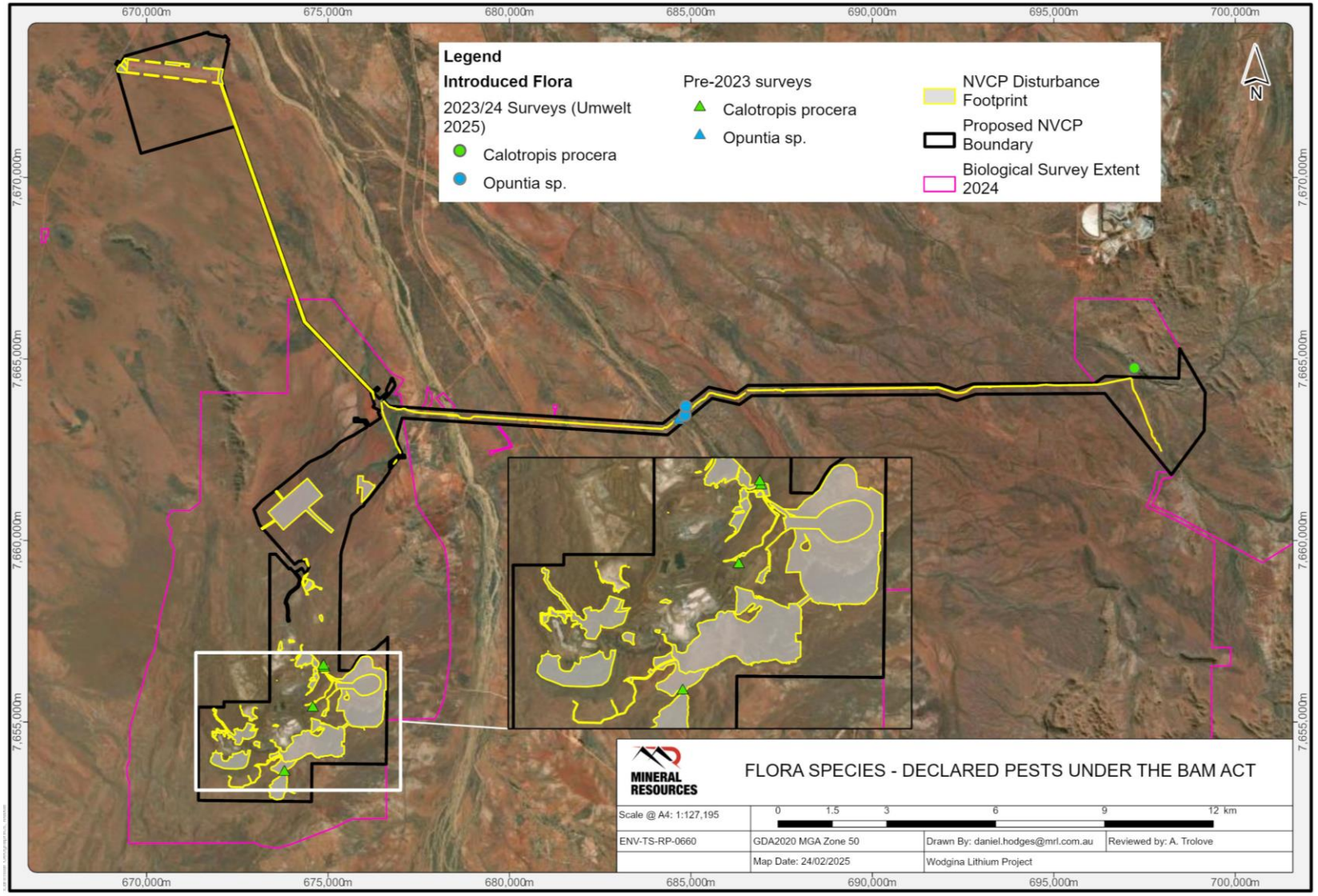


Figure 16: Map of Flora Species - Declared Pests under the BAM Act

8. FAUNA AND HABITAT

Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by MinRes to undertake a detailed terrestrial fauna survey for the Project, with surveys being conducted in 2023 and 2024. The purpose of the surveys was to document the key environmental values in respect to the terrestrial fauna assemblage in accordance with State and Commonwealth regulatory assessment requirements.

The 2023 survey included a reconnaissance fauna survey from 15-19 June 2023 (Winter), a detailed terrestrial fauna survey from 28 September to 11 October 2023 (Spring), and SRE wet pit trap retrieval from 29-30 November 2023 (Summer). The 2023 surveys fall almost entirely within the 2024 survey boundary (see Section 3.3 and Figure 6).

The 2024 survey was undertaken over two trips in autumn covering four study area components. The Wodgina mine area, Wodgina airstrip Breccia borefield (northern component) and Breccia borefield infrastructure corridor were surveyed from 14 –27 March 2024, and the Breccia borefield (southern component) was surveyed from 17–26 May 2024. The survey scope was to conduct a single season detailed terrestrial fauna survey to collect comprehensive, qualitative data on vertebrate and shortrange endemic (SRE) invertebrate Fauna species, assemblages and habitats in the study area, and to confirm the presence of significant species likely to occur in the study area.

The results of 2023 survey are discussed collectively in the 2024 survey report (Phoenix, 2024) as together the 2023 and 2024 surveys represent a dual-phase detailed survey in accordance with EPA survey guidelines (EPA, 2020).

The Detailed terrestrial fauna survey report (Phoenix, 2024) is provided as Appendix E.

8.1 DESKTOP ASSESSMENT

Searches of several biological databases were undertaken to identify and prepare lists of conservation significant fauna that may occur within the study area. Database searches that returned species accounts that occur notably outside of the species known range (extralimital) without sufficient supporting evidence were disregarded from the search results, excluding species of conservation significance. Records of species only identified to genus (i.e. *Genus* sp.), returned in database search results were disregarded unless they represented the only record of the genus.

8.1.1 Vertebrate

The desktop review identified records of 402 vertebrate taxa within the desktop search extent. The list comprised 10 frogs, 119 reptiles, 217 birds (including one naturalised species) and 56 mammals (including 10 introduced). Of the 402 vertebrate taxa returned, 214 have locatable records within the desktop search extent, and the remaining 188 taxa are from sources that do not provide record locations (such as Dandjoo Biodiversity Data Repository, formerly NatureMap, and EPBC Protected Matters Search Tool) and include instances where suitable habitat either may, is likely or known to occur but the species has not necessarily been observed.

Sixteen significant vertebrate species have previously been recorded in the vicinity of the study area:

- Brush-tailed Mulgara (*Dasycercus blythi*, P4)
- Common Sandpiper (*Actitis hypoleucos*, Mig.)
- Fork-tailed Swift (*Apus pacificus*, Mig.)
- Ghost Bat (*Macroderma gigas*, VU)
- Greater Bilby (*Macrotis lagotis*, VU)

- Grey Falcon (*Falco hypoleucos*, VU)
- Long-tailed Dunnart (*Antechinomys longicaudata*, P4)
- Northern Leaf-nosed Bat (*Hipposideros stenotis*, P2)
- Northern Quoll (*Dasyurus hallucatus*, VU)
- Peregrine Falcon (Falco peregrinus, OS)
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia* (Pilbara), VU)
- Pilbara Olive Python (*Liasis olivaceus* subsp. *barroni*, VU)
- Spectacled Hare-wallaby (mainland) (*Lagorchestes conspicillatus* subsp. *leichardti*, P4)
- Western Pebble-mound Mouse (*Pseudomys chapmani*, P4)
- Wood Sandpiper (*Tringa glareola*, Mig.)
- Rufous Grasswren (*Amytornis whitei* subsp. *whitei*, P4)

8.1.2 SRE Invertebrate Fauna

The desktop review identified records of 10 confirmed and 109 potential SRE taxa from within the SRE desktop search area. A further 44 taxa of uncertain SRE status were identified, as well as 43 taxa from SRE groups that have a known range that exceeds 10,000 km^2 (e.g., widespread species).

The desktop records indicate one confirmed (scorpion), 33 potential (11 isopods, 2 mygalomorph spiders, one harvestman, 9 pseudoscorpions, 8 scorpions and 2 selenopid spiders) and 12 uncertain (2 gastropods, 2 isopods, one mygalomorph spiders, 5 pseudoscorpions, one scorpion and one selenopid spiders) SRE taxa have previously been recorded within the study area, mainly from within the Wodgina mine area.

8.2 FAUNA HABITATS

Phoenix (2024) identified seven broad fauna habitat types in the study area which include Spinifex stony plains, Spinifex sandplain, Rocky foothills, Drainage line, Rocky ridge and gorge, Stony rises and Ironstone ridge top. These habitats are described in Table 13 and mapped extents are presented in Figure 17.

Habitats in the region that would provide critical habitat for significant vertebrates identified in the desktop review include:

- Rocky ridge and gorge, and
- Drainage line.

All habitats are considered widespread in the region with the exception of Ironstone Ridgetop and Rocky Ridge and Gorge habitats with both considered to be limited in extent.

The Rocky Ridge and Gorge habitat is considered the most important habitat within the Project area as it provides denning, breeding, roosting and foraging habitat for several protected fauna species, including the Northern Quoll, Pilbara Leaf-nosed Bat and Ghost Bat, and is limited in extent in the region compared with other habitat types. The Rocky Ridge and Gorge Habitat is associated with the Abydos Plain - Chichester 626 land system which extends northward in the landscape.

Table 13: Fauna Habitat Description

Habitat Type	Description	Extent and % of the Study Area	Representative Photograph
Spinifex stony plain	Widely distributed throughout Wodgina mine area, along the infrastructure corridor and throughout Breccia borefield. Mixed-stage hard spinifex (*Triodia spp*.) hummock grassland on a stony/gravelly substrate. May also have scattered *Eucalyptus* and low stands or isolated shrubs of *Acacia* and *Hakea*. Large areas of this habitat type were burnt in the past few years; the spinifex there was often low and patchy (generally stage 1 to 2). Associated with the Boolgeeda, Capricorn, Macroy and Platform land systems. **Suitable nesting and foraging habitat for Western Pebble-mound Mouse; suitable foraging habitat for Peregrine Falcon, Grey Falcon and Ghost Bat; potentially suitable for Oriental Plover, Oriental Pratincole, Long-tailed Dunnart and Pin-striped Fine-snout Ctenotus; low suitability for Night Parrot. Fork-tailed Swift could occur aerially, independent of habitat type.**	5,546.3 ha (42.2%)	
Spinifex sandplain	Limited in extent to Wodgina airstrip, Wodgina mine area (north of the mine) and terraces of the major channels of the Turner River within the infrastructure corridor. Mixed-stage hard spinifex (*Triodia spp*.) hummock grassland on a sandy substrate. May also have scattered *Eucalyptus* and low stands or isolated shrubs of *Acacia* and *Hakea*. Large areas of this habitat type were burnt in the past few years, particularly around the Wodgina airstrip, resulting in the spinifex being often low and patchy (generally stage 1-2). Mostly associated with the Uaroo land system and banks of the River system. **Suitable habitat for Brush-tailed Mulgara, Greater Bilby; Northern Short-tailed Mouse, Pin-striped Fine-snout Ctenotus and Spectacle Hare-wallaby (mainland); suitable foraging habitat for Ghost Bat, Grey Falcon and Peregrine Falcon; potentially suitable habitat for Oriental Plover Oriental Pratincole. Fork-tailed Swift could occur aerially, independent of habitat type.**	1,277.9 ha (9.7%)	

Habitat Type	Description	Extent and % of the Study Area	Representative Photograph
Rocky foothills	Occurs in Wodgina mine area (around the mine pits and south of the mine) and throughout the Breccia borefield. Mostly occurs adjacent to the Rocky ridge and gorge habitat, as well as the Spinifex stony plains. Interfluves among this habitat are highly innervated by drainage tributaries in Breccia borefield. Mixed-stage hard spinifex (*Triodia spp*.) hummock grassland on rocky slopes. May also have scattered *Eucalyptus* and low stands or isolated shrubs of *Acacia* and *Hakea*. Large areas of this habitat type were burnt in the past few years and the spinifex was often low and patchy (generally stage 1 - 2). Associated with Capricorn, Platform, Rocklea and Talga land systems. **Suitable foraging habitat for Northern Quoll, Pilbara Leaf-nosed Bat, Peregrine Falcon, Grey Falcon. Potentially suitable habitat for Long-tailed Dunnart, Spectacle hare-wallaby (mainland) and Western Pebble-mound Mouse. Forktailed Swift could occur aerially, independent of habitat type.**	3,131.0 ha (23.8%	
Drainage line	Major channels of the Turner River are restricted to the infrastructure corridor; moderate drainage channels and dendritic tributaries innervate throughout the Breccia borefield, infrastructure corridor and Wodgina mine area. The Turner River intersects the infrastructure corridor approximately 13 km northeast of the mine and the Turner River West approximately 7 km northeast. Often contains a more complex vegetation structure than the surrounding landscape including a denser understory with significantly more vegetation cover. The vegetation mainly consisted of tall fringing Eucalyptus trees over shrubs of Acacia, Hakea, Melaleuca, and Senna over mixed spinifex and invasive buffelgrass. Some of the minor drainage channels were burnt in the past few years resulting in reduced vegetation cover. Major channels associated with the River land system; dendritic tributaries innervate the Boolgeeda, Capricorn, Macroy, Platform, Rocklea and Talga land systems. **Suitable foraging and dispersal habitat for Pilbara Olive Python, Northern Quoll, Pilbara Leaf-nosed Bat, and Ghost Bat. Potentially suitable breeding habitat for Grey and Peregrine Falcons. Potentially suitable habitat for Osprey and Red Goshawk after significant rainfall. Fork-tailed Swift could occur aerially, independent of habitat type.**	843.6 ha (6.4%)	 Site: WOD009 (located south of the Mine area)

Habitat Type	Description	Extent and % of the Study Area	Representative Photograph
			 Site: WLP014 (located in Turner River main channel)
Rocky ridge and gorge	Limited extent in Wodgina mine area, along the outside of the mine pits, as well as isolated ranges south and north of the mine and Breccia borefield. Hard spinifex hummocks on steep rocky slopes with ironstone outcroppings, crevices, caves, and overhangs. May also have scattered *Eucalyptus* and low stands or isolated shrubs of *Acacia* and *Hakea*. Large areas of this habitat type were burnt in the past few years and the spinifex was often low and patchy. Mostly associated with the Capricorn land system, isolated areas throughout Talga, Rocklea and Macroy land systems. **Suitable foraging and roosting/denning habitat for Northern Quoll, Pilbara Leaf-nosed Bat and Ghost Bat. Suitable foraging and potentially nesting habitat for Peregrine Falcon. Suitable foraging habitat for Grey Falcon. Suitable habitat for Long-tailed Dunnart and Ganes Blind Snake. Fork-tailed Swift could occur aerially and independent of habitat type.**	681.1 ha (5.2%)	

Habitat Type	Description	Extent and % of the Study Area	Representative Photograph
Stony rises	Limited extent in Wodgina mine area, to the north, east and west of the mine, and isolated areas throughout the Breccia borefield. Hard spinifex hummocks on rolling stony hills with rocky outcrops. May also have scattered *Eucalyptus* and low isolated shrubs of *Acacia*, *Senna*, and *Hakea*. Large areas of this habitat type were burnt in the past few years and the spinifex was often low and patchy. Associated with Boolgeeda, Capricorn, Platform and Talga land systems. **Suitable foraging habitat for Northern Quoll and Ghost Bat. Suitable nesting habitat for Western Pebble-mound Mouse. Suitable habitat for Long-tailed Dunnart and Spectacled Hare-wallaby. Fork-tailed Swift could occur aerially, independent of habitat type.**	169.1 ha (1.3%)	
Ironstone ridge top	Limited extent in Wodgina mine area, along the edges of the mine pits and south of the mine. Hard spinifex hummocks on flat or gently sloped, rocky ridge tops with scattered low shrubs. The habitat is very exposed with limited vegetation cover. Associated with the Capricorn land system. **Suitable foraging habitat for Ghost Bat, Northern Quoll, Peregrine Falcon and Grey Falcon. Fork-tailed Swift could occur aerially, independent of habitat type.**	227.7 ha (1.7%)	

Habitat Type	Description	Extent and % of the Study Area	Representative Photograph
Disturbance	Areas cleared for infrastructure, including roads, rail lines, borrow pits, current operations, waste disposal, or otherwise disturbed habitat.	1,261.9 ha (9.6%)	
	Total	**13,138.6 ha (100%)**	

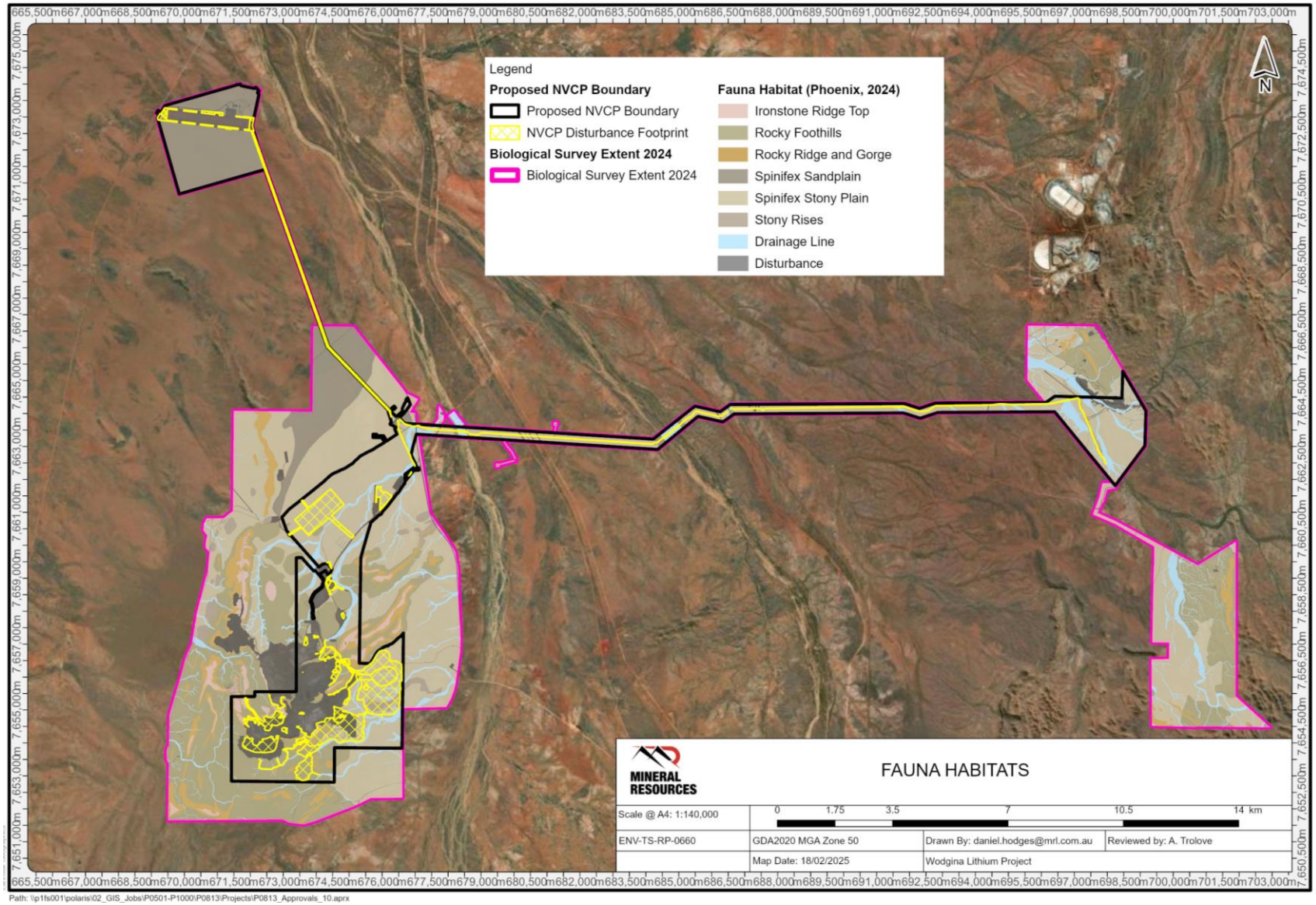


Figure 17: Map of Fauna Habitats

8.2.1.1 Bat Roosts

There are a number of known roosts for Ghost bat and Pilbara Leaf-nosed Bat (PLNB) known in the Survey area and in the region.

The nearest regionally significant diurnal roost supporting PLNB is the Yule River Roost located approximately 20 km from the Project. Other regionally significant roosts near the project include the Glacier Valley Roost, Eastern Turner River Roost and Lalla Rookh Roost, located approximately 14 km, 14 km and 28 km from the proposed Permit Boundary respectively. Given the distance between these roosts and the Project, it is unlikely these roosts will be impacted. Regionally significant roosts for the PLNB near the Project are presented in Figure 18.

Roosts at the Project were most recently defined by Western Wildlife (2020). Since this report, an updated classification system for Ghost bat and PLNB roosts was defined by Bat Call WA [(2021a) (2021b)] and adopted by the Department of Agriculture, Water and the Environment (DAWE; now DCCEEW). Phoenix (2024) identified an additional Category 2 ghost bat roost located to the north of the Project. To align with the current classification system the Western Wildlife (2020) roost descriptions, the definitions presented in Table 14 have been adopted.

The location of known Ghost bat and PLNB and roosts at and near the Project are presented in Figure 28.

Table 14: Bat Roost Categorisation System

Category	Ghost Bat		Pilbara Leaf-nose Bat	
	Definition (Bat Call WA, 2021a)	Western Wildlife (2020) description	Definition (Bat Call WA, 2021b)	Western Wildlife (2020) description
Category 1	Maternity roosts where seasonal presence of young is proven.	Potential maternity roost	Maternity/diurnal roost sites with permanent ghost bat occupancy	-
Category 2	Permanent roosts occupied year-round but without proven presence of young.	Regionally significant diurnal roost	Maternity/diurnal roost caves with regular occupancy	-
Category 3	Semi-permanent diurnal roosts (used diurnally during some parts of the year, but not occupied year-round)	Diurnal Roost	Diurnal roost caves with occasional occupancy	Transitory Diurnal Roost
Category 4	Nocturnal refuge (entered at night for resting, feeding or other purposes, with perching not a requirement)	Nocturnal roost	Nocturnal roost caves with opportunistic usage	Nocturnal Refuge

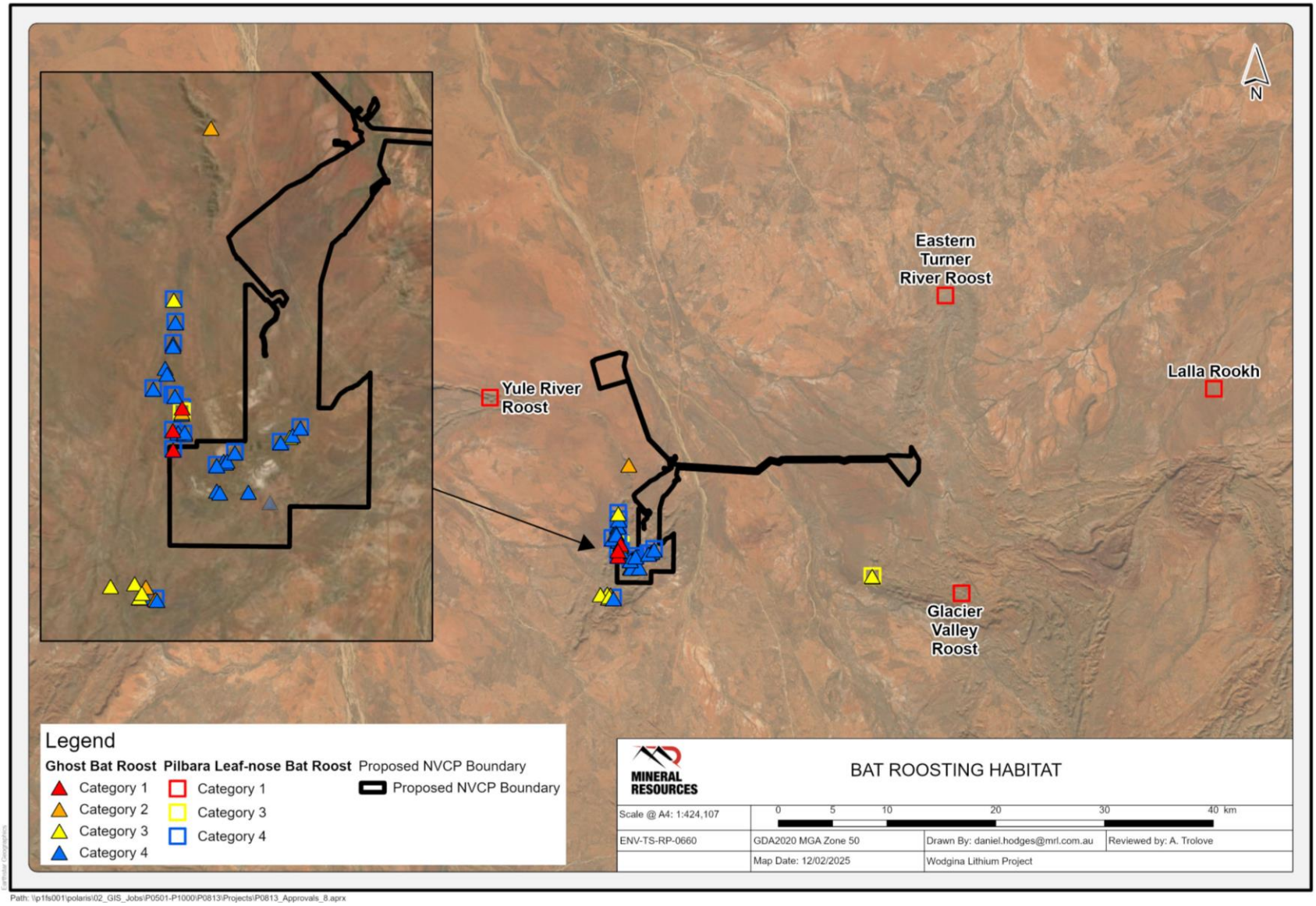


Figure 18: Map of Ghost Bat and Pilbara Leaf-nosed Bat known roost locations

8.3 CONSERVATION SIGNFICIANT FAUNA

The conservation significant fauna recorded during the 2023 and 2024 surveys by Phoenix (2024) are listed below, and summarised in Table 15:

- Northern Quoll (*Dasyurus hallucatus*) (VU)
- Ghost Bat (*Macroderma gigas*) (VU)
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (VU)
- Greater Bilby (*Macrotis lagotis*) (VU)
- Rufous Grasswren (*Amytornis whitei* subsp. *Whitei*) (P4)
- Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4)

Further detail on each species, including location of records in relation to key habitat for the species, is detailed in Sections 8.3.1 to 8.3.6.

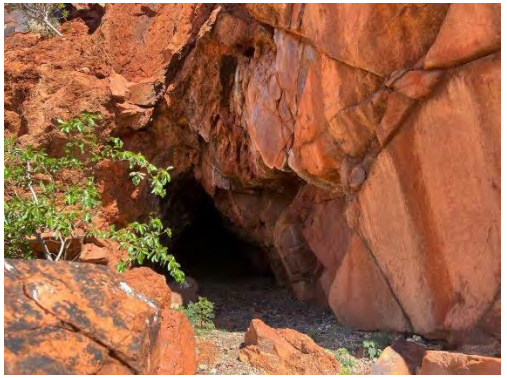
Phoenix (2024) conducted a likelihood of occurrence assessment for the remaining species identified in the desktop review (Section 8.1.1) and determined none are likely to occur in the survey area, 6 may occur and 45 are unlikely to occur. Three of the 45 significant species considered unlikely to occur have previously been recorded in the desktop study area, which included:

- Common Sandpiper (*Actitis hypoleucos)* (Mig.)
- Wood Sandpiper (Tringa glareola) (Mig.)
- Northern Leaf-nosed Bat (*Hipposideros stenotis*) (P2) - although this was likely a misidentification of *R. aurantia* as the Project is outside the current known distribution.

To date, 16 significant vertebrate species have been recorded in the desktop study area across the current and previous surveys. Of the 44 species considered unlikely to occur, 30 have distributions that do not intersect the desktop study area, and their occurrence would be considered a range extension or extralimital record. For further information on species which may or are unlikely to occur, refer to Section 5.2.1.3 of Appendix E for the complete likelihood and occurrence assessment.

The conservation significant fauna recorded by Phoenix during the 2023 and 2024 surveys (listed above) will be the key species considered further for impact assessment. Additional detail for each species, including location of records in relation to key habitat for the species, is provided in Sections 8.3.1 to 8.3.6.

Table 15: Details of Significant Vertebrate Fauna Recorded During the 2023-2024 Field Surveys

Species	Status	Distribution and Ecology	Survey Records	Photograph
Northern Quoll *Dasyurus hallucatus*	EN (EPBC & BC Acts)	The Northern Quoll is the smallest of the 4 Australian quoll species and is a solitary carnivorous marsupial found in the northern parts of Australia (Hill & Ward 2010). The current distribution is discontinuous across northern Australia, with 3 recognised subspecies forming core populations in rocky and/or high rainfall areas (Hill & Ward 2010) across Queensland, the Northern Territory and WA. This primarily nocturnal species makes its dens in rock crevices, tree holes, or occasionally termite mounds. They occur in a variety of habitats across their range including rocky areas, eucalypt woodlands, rainforests, shrubland, sandy areas, grasslands, and desert. Opportunistic foragers that feed on a broad range of items, switching dietary resources according to season and availability (Oakwood 2000, 2008; Pollock 1999) including small mammals, reptiles, birds, carrion and fruit.	**2023**: Camera trap photographs at two sites. **2024**: Seventeen records from camera traps and fresh scat in Rocky ridge and gorge, Rocky Footslopes, Drainage line and Stony rises habitat.	
Ghost Bat (*Macroderma gigas*)	VU (EPBC & BC Acts)	The Ghost Bat is endemic to northern Australia and is the largest microchiropteran species in Australia. It prefers to roost in caves beneath bluffs of low, rounded hills composed of Marra Mamba geology, within rock piles of granite in the Pilbara and sandstone elsewhere, and in adits of abandoned mines (Bat Call WA, 2021a). There is little confirmed knowledge on the species foraging habitat; they have been observed foraging in areas surrounding roost sites (up to 12 km away). In the Pilbara, mostly found foraging among productive plain areas with thin mature woodland over patchy/clumped Triodia spp. hummock grass and watercourses on sand or stony ground. Strictly carnivorous, feeding on other bats, frogs, small birds, lizards, spiders and large insects ((Bullen, R. D, 2021a); (Churchill, S, 2008); (Richards et al (2008)); the Pilbara population has a diet mostly comprising small mammals and birds (Claramunt et al. (2019)). Proficient visual and auditory hunters unlike other microchiropteran bats (Bullen 2021a; Richards et al. 2008).	**2024**: One record (WLP048) from a direct sighting (flushed from a cave – photo provided) in Rocky ridge and gorge habitat. Cave measurements ~25 x 4 x4 m.	

Species	Status	Distribution and Ecology	Survey Records	Photograph
Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*)	VU (EPBC & BC Acts)	The Pilbara Leaf-nosed Bat is endemic to Australia and has a range stretching from the Pilbara region of WA to Queensland. The Pilbara form, however, is restricted to the Pilbara region where it roosts in caves and abandoned mine adits with stable, warm and humid microclimates.	**2023**: Ultrasonic recordings in Drainage line habitat 2.5 km east of the Turner River. **2024**: One-hunded and twelve ultrasonic detections from in Drainage line, Spinifex stony plains and Rocky ridge and gorge.	No photo
Greater Bilby (*Macrotis lagotis*)	VU (EPBC & BC Acts)	The Greater Bilby is a rabbit-sized marsupial that originally occupied over 70% of the Australian mainland. It now occurs in less than 20% of its original range, with remaining Western Australian populations predominantly in the Great Sandy and Gibson Desert.	**2023**: Old foraging evidence and old scat at recorded in Spinifex Sandplain habitat. **2024**: Two records of scat in Spinifex sandplain (adjacent to Turner River).	
Rufous Grasswren *Amytornis whitei* subsp. *whitei*	P4 (DBCA list)	The nominate subspecies *A. w. whitei* is restricted to spinifex habitat associations on red rocky ridges and slopes in the Pilbara and prefers tall and dense spinifex hummocks with or without shrubs or light tree cover. Semi-gregarious, foraging on the ground between spinifex hummocks. Erratic and flushed easily when disturbed.	**2024**: One record from a direct sighting in Rocky foothills habitat in eastern section of survey area.	No photo

Species	Status	Distribution and Ecology	Survey Records	Photograph
Western Pebble-mound Mouse (Pseudomys chapmani)	P4 (DBCA list)	The Western Pebble-mound Mouse is widespread in the ranges of the central and southern Pilbara and extends into the Little Sandy Desert Ranges. Habitat preferences include rocky, hummock grasslands with little or no soil and an overstorey of Acacia (Burbidge, 2016). Mounds are typically located on the gentle slopes of rocky ranges. The presence of suitably sized gravel and pebbles is a distribution-limiting factor for this species.	**2023**: extinct mounds found at several sites, and one trapped. Recorded primarily in Spinifex Stony Plain habitat, one record in Stony Rises habitat, most records nearby drainage lines. **2024**: Eleven records from old nests and direct sightings (captured in pipe trap) in Spinifex Stony Plain, Rocky Footslopes and Drainage line habitat.	 

8.3.1 Northern Quoll

The Northern Quoll (*Dasyurus hallucatus*) is listed under the EPBC Act and BC Act as Endangered. The Northern Quoll preferred habitat includes:

- Rocky ridge and gorge
- Drainage line.

Available survey records for the Northern Quoll start in 2008 with population sizes varying between years, most likely responding to environmental factors such as rainfall and fire events (Umwelt, 2022). Early survey records for the Northern Quoll suggested the species was locally abundant (11 female and three (3) male captures) with annual survey records dropping in 2014 and 2016 after widespread bushfires. Low capture rates continued in 2015 and 2016 with only one female trapped in 2017 and seven (7) individuals captured in 2018 (Western Wildlife, 2020). Combined survey effort in 2018 recorded the Northern Quoll on 24 occasions however a number of these may have been from the same animal (two motion cameras and 22 scat records) (Figure 19). Survey effort to date has not identified any denning sites within the proposed NVCP Permit Area (Western Wildlife, 2020).

The species is highly mobile and capable of dispersing up to 20 km in a night. The presence of females in the population indicates the potential for breeding within the Fauna Study Area. The Rocky ridge and gorge habitat is associated with the Abydos Plain - Chichester 626 land system which extends northward in the landscape (Figure 20) is likely to provided denning and foraging habitat through the broader region. Supported by historic records of conservation significant fauna species, the Rocky ridge and gorge habitat associated with the land system provides connectivity across the project area and surrounding environment, allowing for migration and dispersion of these key fauna species across the wider region. There will be some impact to a small percentage of the key habitats due to the footprint of the Project infrastructure, however, it is expected that the North Quoll will migrate to nearby suitable habitat during disturbance activities.

Locations of Northern Quoll records are provided in Figure 19.

An assessment of the scale and risk of impacts to the Northern Quoll is detailed in Section 9.4.

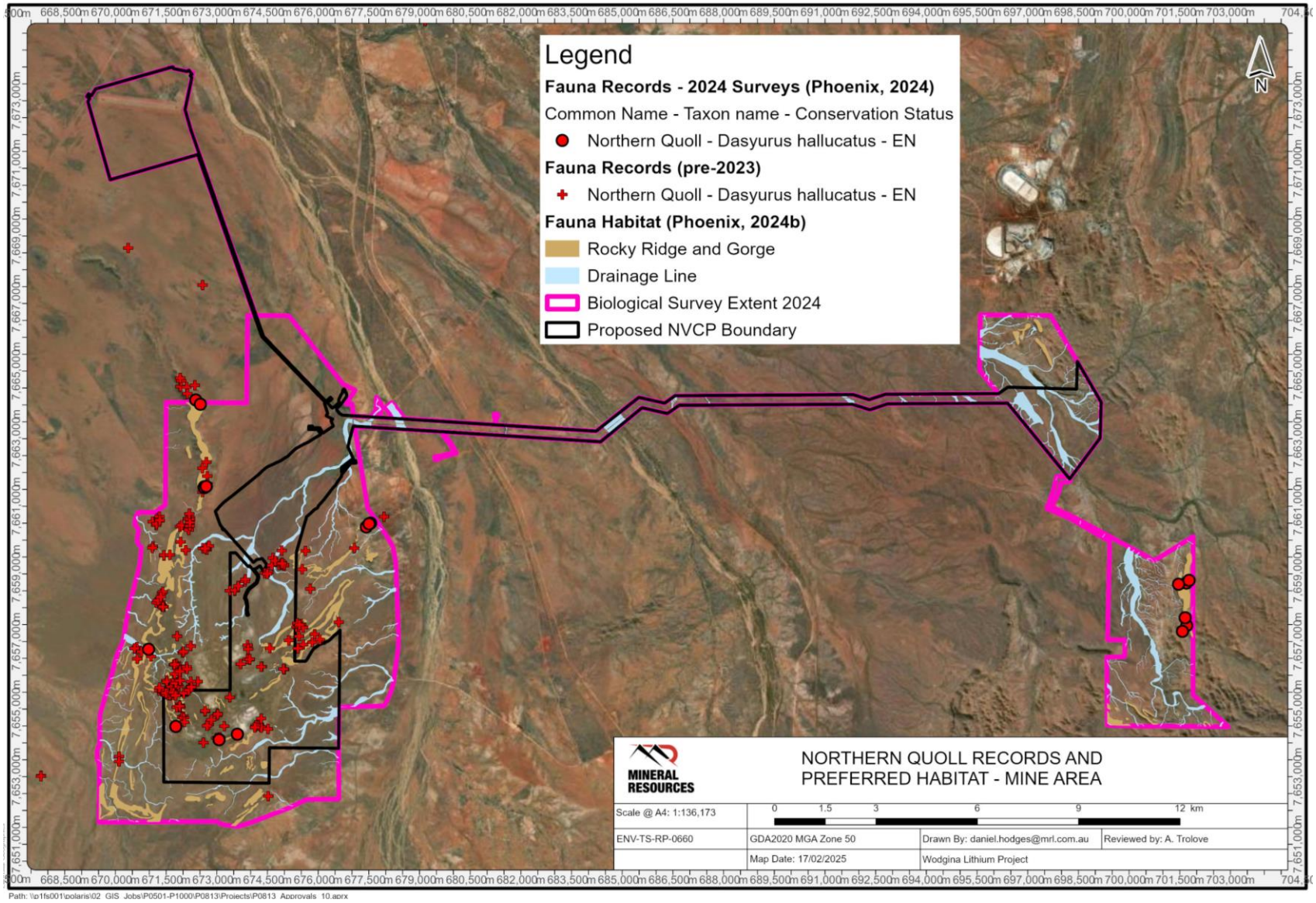


Figure 19: Map of Northern Quoll Records and Habitat - Mine Area

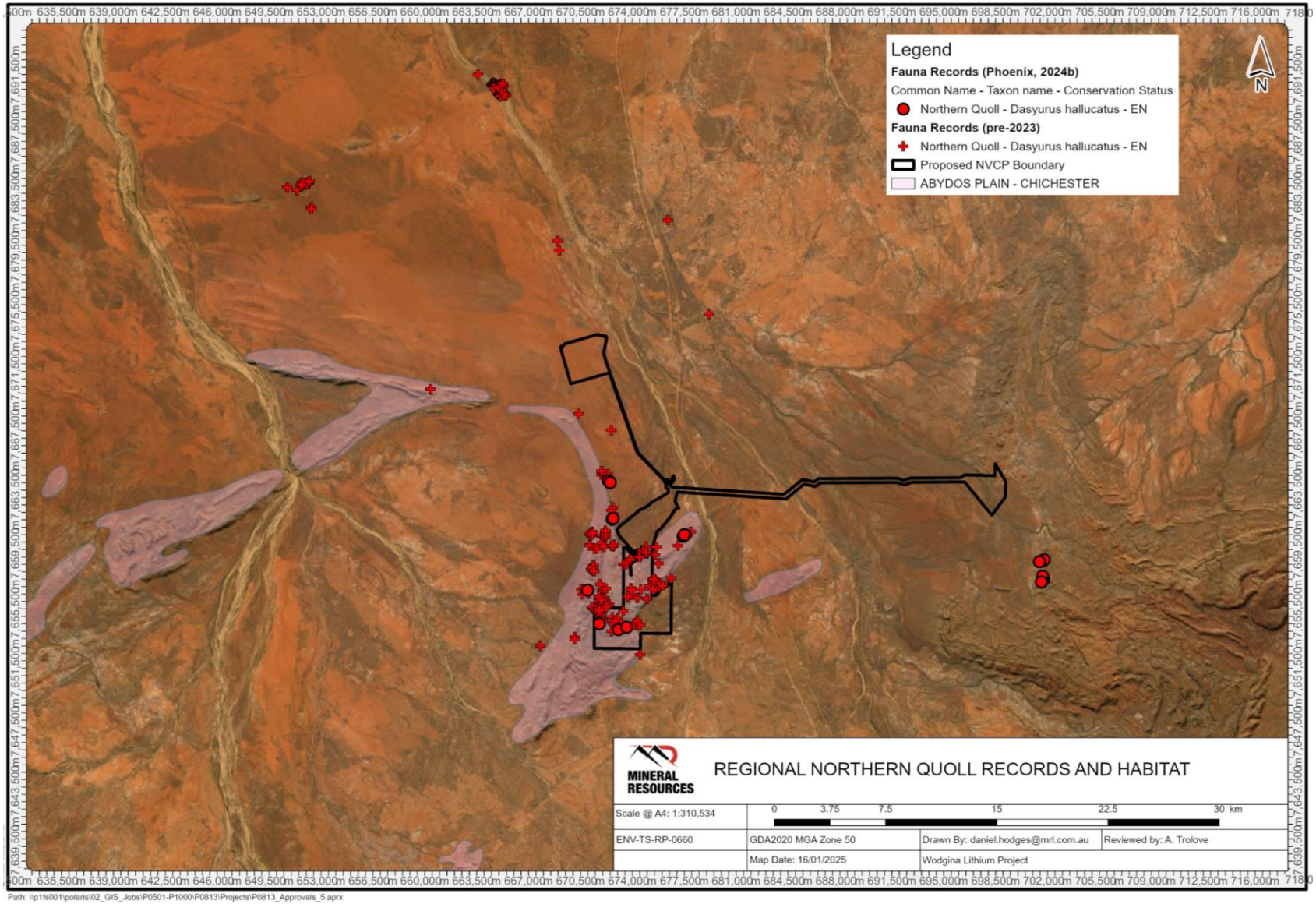


Figure 20: Map of Regional Northern Quoll Records and Habitat

8.3.2 Ghost Bat

The Ghost Bat (*Macroderma gigas*) is listed under the EPBC Act and BC Act as Vulnerable. The Ghost Bat uses the proposed NVCP Permit Area for roosting and foraging, with suitable habitat and known caves extending into the wider regional area and widespread in the Pilbara region.

Ghost bat records intersect the study area, which have been documented during previous surveys for the Project (detailed, targeted and monitoring surveys from 2009 to 2022). Most records are concentrated in the rocky ridgeline that extends west and south of the Wodgina mine, as well as the locally associated dendritic drainage channels. Several isolated records also occur in the ridgeline west, south and east of the Breccia borefield (Phoenix, 2024).

The ridgelines within Wodgina mine area (surrounding the mine) contain 3 known potential maternity roosts and 3 diurnal roosts (Figure 18). Another diurnal roost is present on a ridgeline approximately 0.3 km south of the edge of the Wodgina mine area (Figure 18). Regionally, there are 2 well known permanent diurnal roosts, both occurring in disused mine adits; Lalla Rookh mine (approximately 65 km east-northeast of the Wodgina mine) and Comet mine (approximately 115 km east of the mine; Figure 18) (Bat Call WA, 2021a). These sites are important refuge and source populations for the region (Bat Call WA, 2021a).

The Rocky foothills and Rocky ridge and gorge habitats provide suitable roosting areas for Ghost Bats. Despite a deficit in foraging habitat knowledge, unpublished data from the Pilbara suggest Ghost Bats forage over productive plains with thin mature woodland over tussock and/or hummock grasses on sand or stony substrates (Bat Call WA, 2021a). Drainage lines are known to provide suitable dispersal and foraging habitat; however, other habitats in the study area are likely used for foraging (Ironstone ridgetop, Rocky foothills, Stony rises) (Phoenix, 2024); their detection in these habitats however, when situated away from roosting sites, is difficult as their foraging strategy primarily uses visual and auditory sensory input, and less frequently use echolocation (Bat Call WA, 2021a).

The location of the ghost bat records, important habitat, known caves and significant caves are presented in Figure 21.

An assessment of the scale and risk of impacts to the Ghost Bat is detailed in Section 9.4.

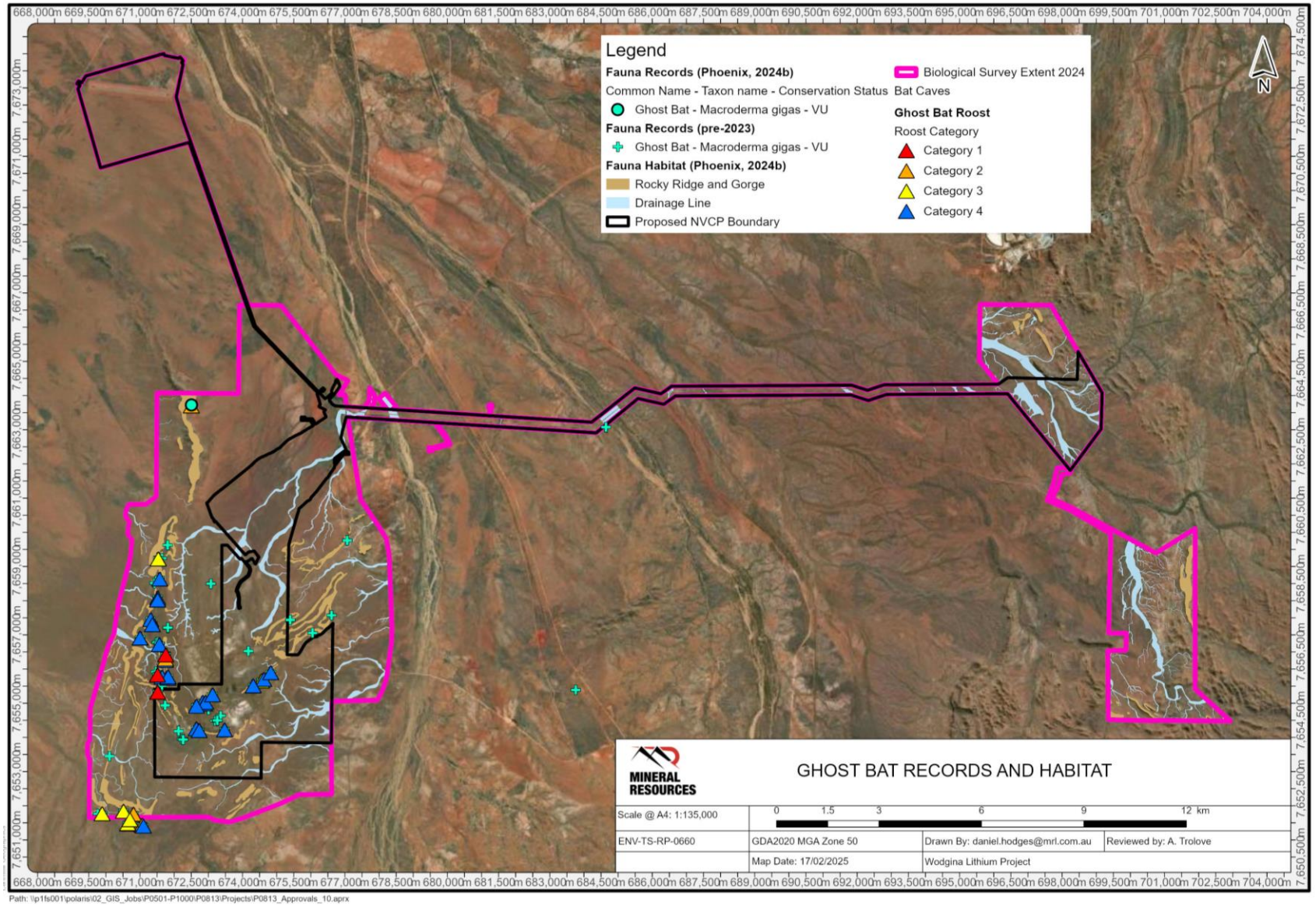


Figure 21: Map of Ghost Bat Records and Habitat

8.3.3 Pilbara Leaf-nosed Bat

The Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) is listed under the EPBC Act and BC Act as Vulnerable. The Pilbara Leaf-nosed Bat uses the proposed NVCP Permit Area for roosting and foraging, with suitable habitat and known caves extending into the wider regional area and widespread in the Pilbara region.

Pilbara Leaf-nosed Bat intersects the Permit Area and was recorded in the study area which has widely been recorded in previous surveys (detailed, targeted and monitoring from 2009 to 2023). Majority of the records are located in the Wodgina mine area, west of the mine, throughout the rocky ridge and gorge habitat. Several isolated records located in drainage lines and spinifex stony plains. The Pilbara Leaf-nosed Bat was recorded in the 2024 survey using ultrasonic detection at eight sites within the study area

The Rocky ridges and gorge habitats identified contain a known transient diurnal roost and the associated Drainage lines. The species has been well-documented more widely throughout the desktop search extent, with numerous records to the east of the Breccia Borefield, around the Abydos and Iron Bridge mines however no permanent diurnal roosts have been recorded. It is likely that the caves within the Wodgina mine area are only used as non-critical nocturnal refuges (Stantec, 2018).

The Rocky foothills and Rocky ridge and gorge habitats are both suitable habitats by topographically complex geologies containing caves, crevices and overhangs which may provide suitable roosting habitat. Despite no natural water sources being identified in the current survey, previous surveys in the vicinity have recorded several permanent and semi-permanent water sources in the Rocky ridge and gorge habitat. This species is well-documented in the wider region, with several major source colonies situated outside of the Study Area.

Critical habitats for the Pilbara Leaf-nosed Bat, as defined by Bat Call WA (Bat Call WA, 2021c), includes Category 1, 2 and 3 caves, along with permanent pools close to permanent diurnal roosts. For further information, refer to Section 6.1.3.10 of Appendix E. Specific management and mitigations measures for this NVCP application are discussed in Section 9.4.

The location of the Pilbara Leaf-nosed Bat records, important habitats, known caves and significant caves are presented in Figure 22.

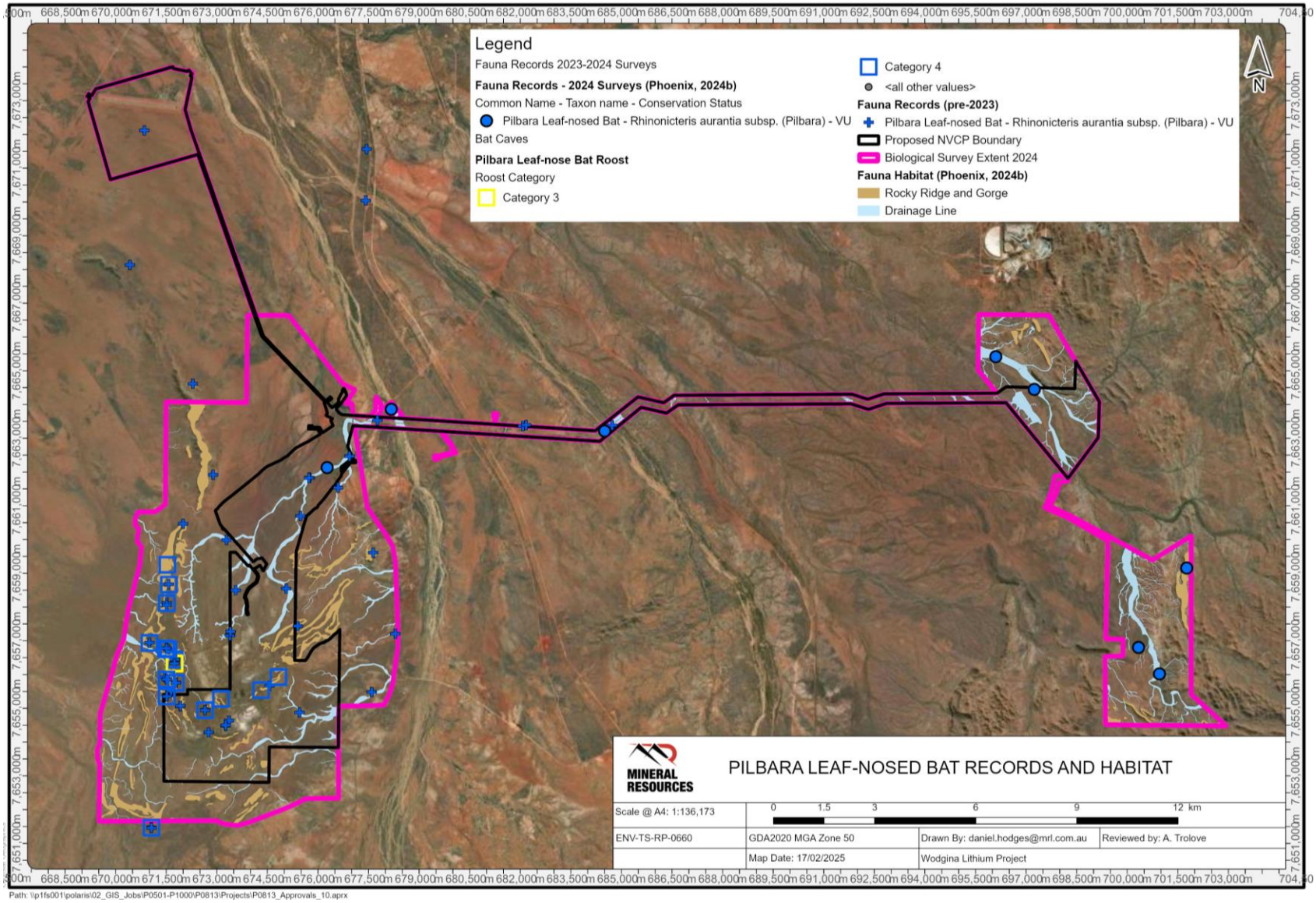


Figure 22: Map of Pilbara Leaf-nosed Bat Records and Habitat

8.3.4 Greater Bilby

The Greater Bilby is a solitary, medium-sized burrowing marsupial formerly widespread across much of Australia. In WA, indigenous populations are mostly restricted to the Gibson Desert, Little Sandy Desert, Great Sandy Desert, and areas of the Pilbara and southern Kimberley. These populations mostly occur in open tussock grasslands on uplands and hills, Mulga woodland/shrubland on ridges and rises, and hummock grassland in plains and alluvial areas. These habitats are normally characterised as being of low relief with light to medium soils that are often sandy, ideal for burrow excavation. Greater Bilby have a moving home range which can vary considerably in size between locations. There is no critical habitat defined for the Greater Bilby.

The Greater Bilby (*Macrotis lagotis*) is listed under the EPBC Act and BC Act as Vulnerable.

Phoenix (2024) recorded two individual scats in Spinifex sandplain, one of which was considered relatively fresh during the 2024 survey, as well as during the 2023 survey. Greater Bilby has previously been recorded in the study area, including throughout Spinifex sandplain in the Wodgina airstrip by from 2015 to 2023. The species has been well-documented throughout the wider desktop region from 1970-2022; a large number of records are located approximately 23 km southeast of the study area.

Survey evidence suggests Greater Bilby utilise the Spinifex sandplain habitat and areas of major drainage in the study area, with the most recent evidence located along the Infrastructure Corridor. Due to the scarcity of evidence, they are likely either sparsely distributed, in very low numbers or intermittently present where the study area forms part of the species broader moving home range. Other fauna habitats within the study area boasting a spinifex-dominated vegetation assemblage with a rocky stratum are unlikely to support Greater Bilby. Suitable Greater Bilby habitat is widespread in the region.

The Greater Bilby records in the survey area are presented in Figure 23.

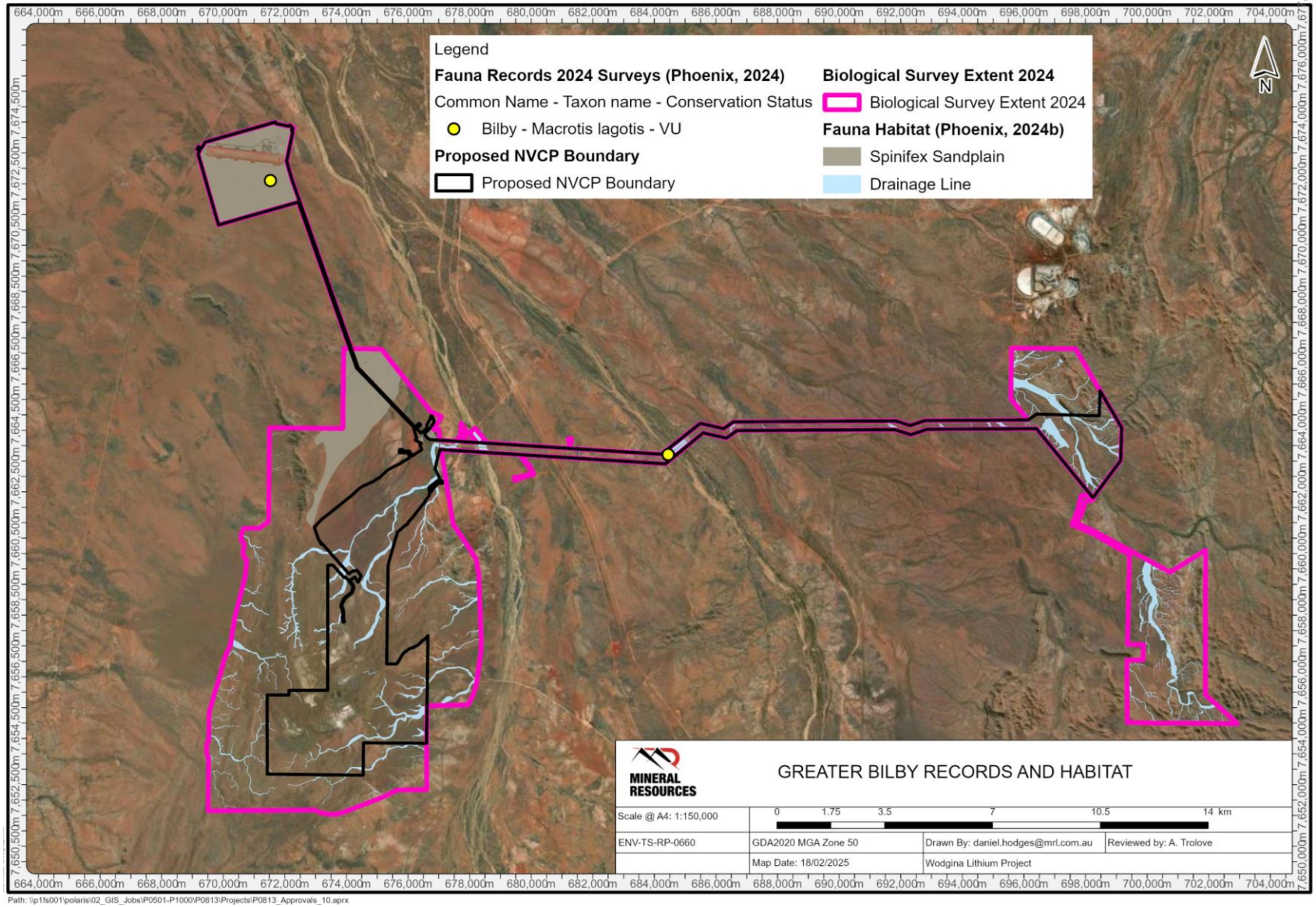


Figure 23: Map of Greater Bilby Records and Habitat

8.3.5 Rufous Grasswren

The Rufous Grasswren (*Amytornis whitei subsp. white*) is listed under the EPBC Act and BC Act as Priority 4 (P4) species. The species has recently delineated from the widely distributed *A.striatus* from which it was formerly a species complex (Black et.al (2020)).

The Rufous Grasswren intersect the study area, with one record from a direct observation located in Rocky foothills in the Breccia Borefield. This species has also been recorded previously in the Wodgina mine area, east of the mine area (Western Wildlife, 2020).

There is no critical habitat listed for the Rufous Grasswren. Suitable habitat in the study area comprises Rocky ridge and gorge, and Rock foothills. They are likely to be frequently present in the study area; however, are expected to occur in low numbers. The species is not restricted to the study area, and suitable spinifex-vegetated ridgelines occur extensively within the immediate regions surrounding the study area.

The Rufous Grasswren records in the survey area are presented in Figure 24.

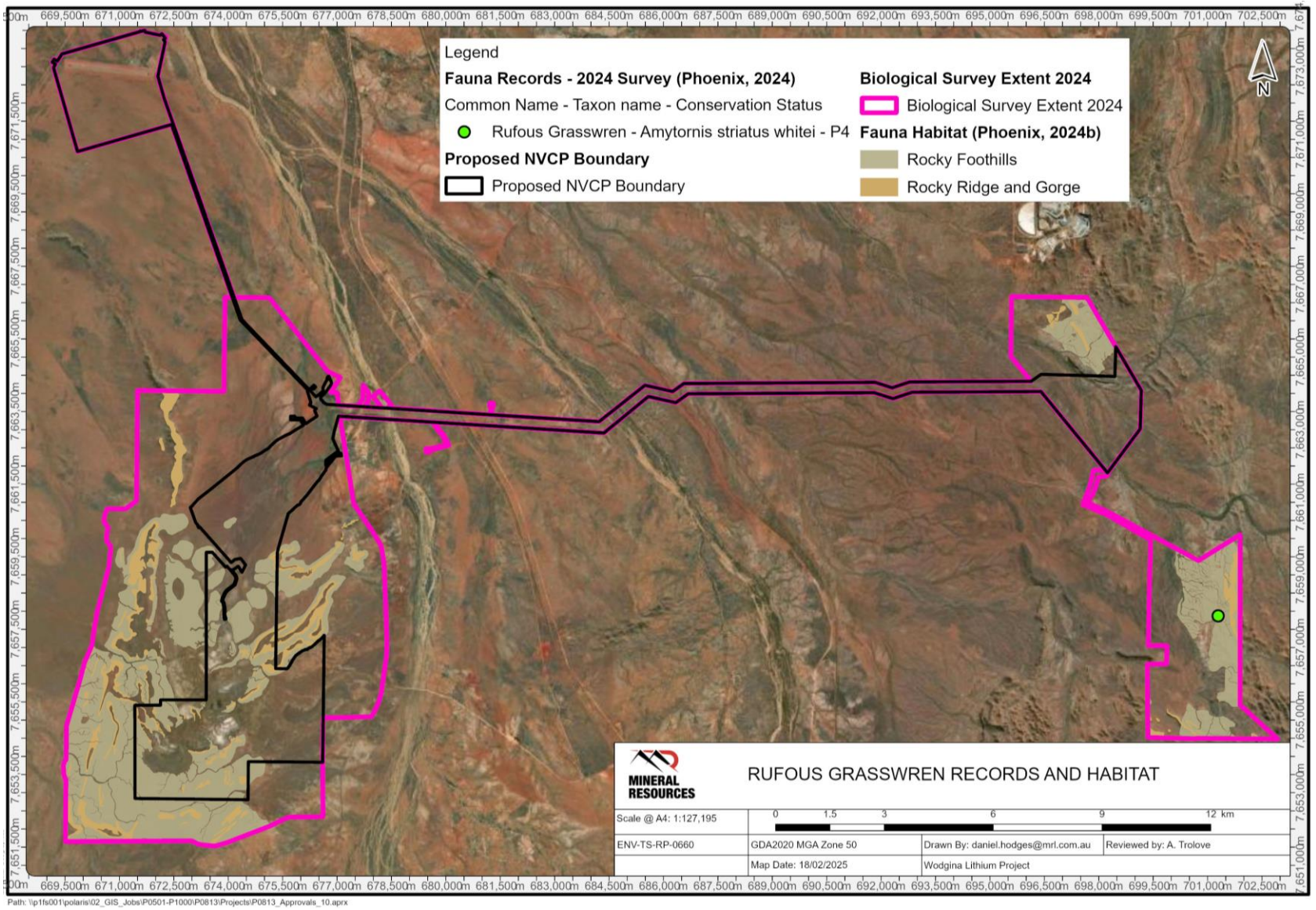


Figure 24: Map of Rufous Grasswren Records and Habitat

8.3.6 Western Pebble-mound Mouse

The Western Pebble-mound Mouse (*Pseudomys chapmani*) is listed under the EPBC Act and BC Act as Priority 4 (P4) species. The Western Pebble-mound Mouse occurs in the proposed NVCP Permit Area for mounding and foraging, with suitable habitat widespread in the region.

Western Pebble-mound Mouse was recorded in the study area which has widely been recorded in previous surveys (detailed, targeted and monitoring). Majority of the records are located in Spinifex stony plains. Several other records located in Ironstone ridge top and rocky foothills habitat.

The low stony hills allow the Western Pebble-mound Mouse prefers gentle, sparsely vegetated slopes of rock ranges including areas vegetated by spinifex with a sparse canopy of eucalyptus. The availability of suitable sized stones and pebbles for mound construction is a primary component determining habitat suitability and distribution-limiting factor. In these habitats, mounds may be found in large numbers but not all active and occupied simultaneously. They are almost certain breeding residents of the study area; however, suitable habitat is extensive and continuous beyond the boundaries and suitable habitat is widespread throughout the broader Pilbara region.

The Western Pebble-mound Mouse records are presented in Figure 25.

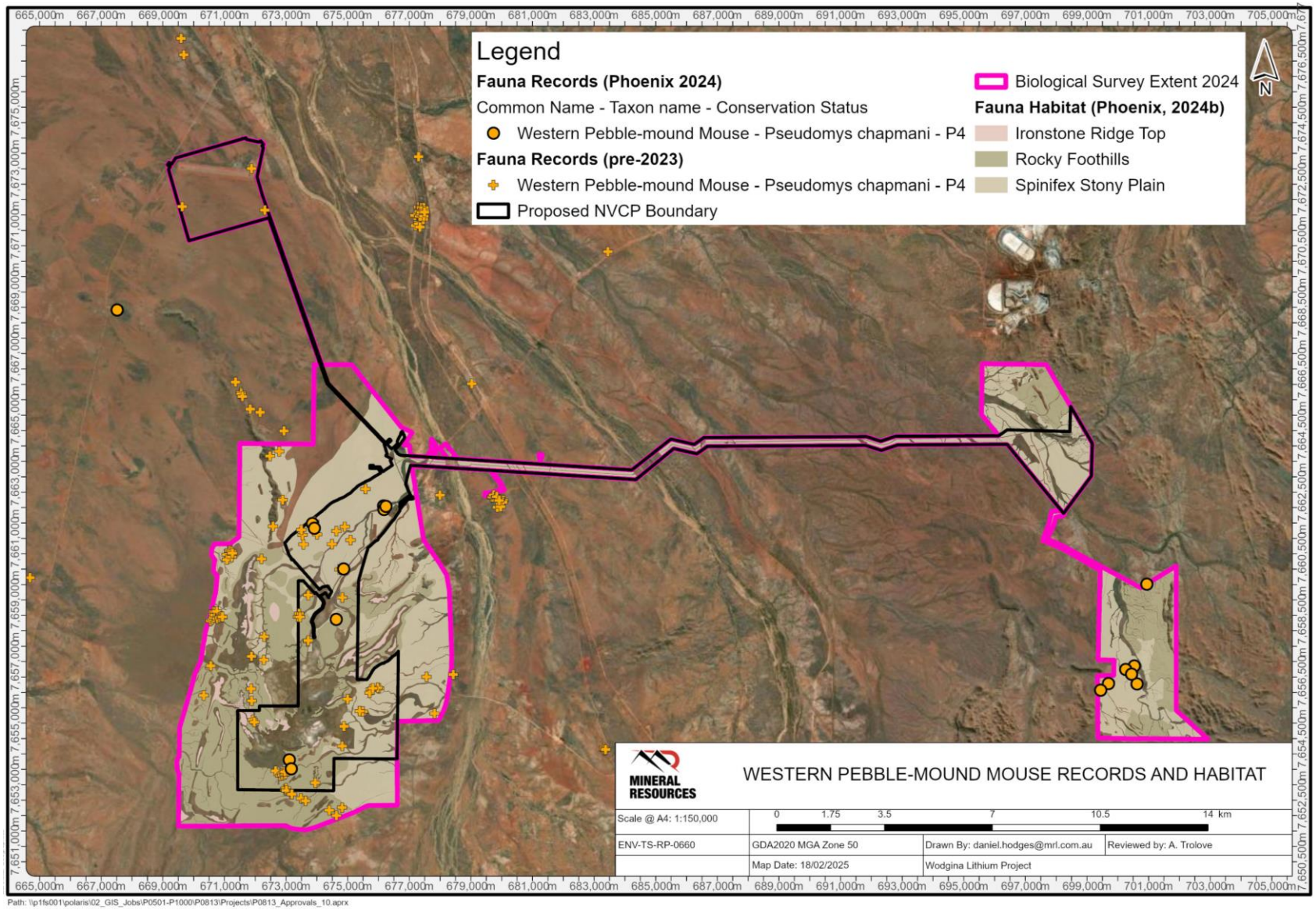


Figure 25: Western Pebble-mound Mouse Records and Habitats

8.4 SHORT RANGE ENDEMICS

Phoenix (2024) identified a total of 180 specimens representing 27 taxa from SRE groups, this assemblage included;

- Three mygalomorph spiders
- Eight scorpions
- Five pseudoscorpions
- Three harvestmen
- One land snail
- Seven isopods.

Phoenix identified no significant invertebrate taxa, or any taxa confirmed SRE. Of the 27 taxa identified, 20 are Potential, three are Widespread and four are of Uncertain SRE status due to not being able to allocate a species-level identification.

9. IMPACT ASSESSMENT AND SITE-SPECIFIC MITIGATION MEASURES

This section provides an overview and summary of potential impacts from this proposed NVCP Application.

Direct and Indirect Impacts

The impact assessment has considered for the following direct and indirect impacts associated with the proposed clearing of native vegetation across the Permit Area:

- **Direct impacts** are defined as those impacts on environmental values occurring as a result of direct removal of significant flora, vegetation, fauna and fauna habitat components by the Application e.g. impacts arising from clearing of native vegetation or removal of fauna habitat.
- **Indirect impacts** are defined as those impacts on environmental values through indirect pathways as a result of the Proposal, and includes causes such as dust emissions, altered hydrological regimes (groundwater drawdown and/or creation of drainage shadow), fragmentation of habitat and/or populations, increased predation and weed introduction.

Cumulative Impacts

The potential impacts associated with incremental loss of habitats supporting native flora, vegetation and fauna from the proposed clearing, when considering previous clearing associated with the project, as well as clearing undertaken within local and broader region setting, presents a cumulative impact and threat to key the environmental values at the site and surrounding environment.

In the context noted above, cumulative impacts associated with the proposed clearing and ground disturbance activities have the potential to result in the below impacts, and have been taken into consideration in assessing the scale and significance of the impacts:

- **Cumulative impacts** are defined as those impacts on significant flora, vegetation and fauna values as a combination of the Proposal and impacts through historical clearing, as far as they can be assessed.

In addition to the standard MinRes clearing mitigation controls described in Section 2.3, site-specific mitigation measures are included where appropriate to reduce potential clearing risks associated with this Application to vegetation communities, conservation significant flora and fauna.

9.1 ADMINSTRATIVE CONSIDERATIONS

As Wodgina has been operated since 1902, baseline data before any disturbance is not available. To support the NVCP applications for CPS 9911/1 and CPS 10346/1, clearing post-2009 was considered for cumulative impact assessment and was detailed in Umwelt (2022) (Appendix G) and the CPS 10346/1 application. This approach has been adopted for this application, with disturbance to previous habitat types, vegetation units and flora considered.

To inform the cumulative impact assessments, disturbance between 2009 and 2022 as calculated by Umwelt (2022) has been adopted, with the addition of disturbance reported in the CPS9911/1 Annual Environment Report (AER) submitted for the 2022-2023 period.

Note the extent of mapped historic disturbance in the Phoenix (2024) varies from Western Wildlife (2020), meaning the limits imposed under CPS-10346/1 Condition 4 will not be directly comparable to the mapping presented by Phoenix (2024).

Disturbance mapping by Umwelt (2025) matches the Woodman (2020) mapping, where survey extents overlap.

To simplify the activities proposed in this application with comparison to the existing CPS 10346/1 conditions, draft conditions have been provided in Section 9.7.

To allow for improved readability of figures and spatial data used to inform the impact assessment, more detailed figures of the following are included in Appendix H:

- Permit Boundary and Disturbance Footprint
- Vegetation Types
- Vegetation Condition
- Conservation Significant Flora
- Fauna Habitat.

9.2 VEGETATION IMPACT ASSESSMENT

This section assesses the key impacts relating to vegetation associated with the proposed disturbance. The key impact pathway for vegetation is direct loss and cumulative impact through clearing.

9.2.1 Clearing of Native Vegetation

9.2.1.1 Vegetation System Associations

No TECs or PECs were recorded in the project area. GDV is likely to be present within VT11, however proposed disturbance to this vegetation is considered limited (Section 9.2.1.3).

Four vegetation systems mapped within the proposed NVCP Permit Area, with three intersecting the proposed disturbance footprint which will be directly impacted by clearing activities. The direct impacts from clearing to vegetation systems are presented in Table 16.

- The proposed NVCP footprint will not reduce the extent of regional Vegetation Systems Association to below the 30% pre-European extent threshold (EPA, 2008).

Table 16: Impact on the Vegetation System Associations from Proposed Disturbance

Vegetation System Association	Description	Current Extent (ha)	Pre-European Extent Remaining	Proposed disturbance (9911+10346) (ha)	Pre-European Extent Remaining post-CPS10346 disturbance
Abydos Plain – Chichester 93	Hummock grasslands, shrub steppe; kanji over soft spinifex	2,478,504	99.9%	521.4	99.9%
Abydos Plain – Chichester 619	Medium woodland; river gum (*Eucalyptus camaldulensis*)	71,201	99.9%	1.7	99.9%
Abydos Plain – Chichester 626	Hummock grasslands, shrub-steppe; kanji over soft spinifex and *Triodia brizoides*	117,198	99.6%	211.9	99.4%

Vegetation System Association	Description	Current Extent (ha)	Pre-European Extent Remaining	Proposed disturbance (9911+10346) (ha)	Pre-European Extent Remaining post-CPS10346 disturbance
George Ranges 82	Hummock grasslands, low tree steppe; snappy gum over *Triodia wiseana*	316,855	99.9%	0.0	99.9%

9.2.1.2 Impact to Vegetation Types

The assessment of impacts to VTs has been undertaken by comparing the proposed disturbance footprint against the mapping from Umwelt (2025). To quantify the potential local impact to VTs, the ranking system presented in Table 17 is used.

Cumulative assessment against true baseline mapping is not possible as there is no VT dataset that covers the entire extent of original vegetation in the Flora Study Area prior to historical clearing activities. The VT dataset used in this assessment covers a total of 1103.8 ha of previously cleared area (includes areas under rehabilitation).

Table 17: Risk Rating of Potential Local Impact on Vegetation Types

Ranking of Potential Impact	Description of Impact
Low	<25 % of mapped VT in Study Area may potentially be impacted
Moderate	25 - 50 % of mapped VT in Study Area may potentially be impacted
High	>50 % of mapped VT in Study Area may potentially be impacted

The assessment of local impacts to VTs is presented in Table 18.

There were no occurrences the proposed disturbance to vegetation types exceeded 25% of the mapped extents by Umwelt (2025), and therefore the risk of potential impacts is considered low.

Table 18: Direct Impacts – Vegetation Types

VT #	Flora Study Area (Umwelt, 2025)	Proposed NVCP Permit Area		Proposed Disturbance Footprint (CPS 9911/1 + CPS 10346)		Local Potential Impact
	Hectares	Hectares	%	Hectares	%	
1	2,280	1222.8	53.6%	140.0	6.1%	**Low**
2	787.8	278.4	35.3%	157.5	20.0%	**Low**
3	952.8	63.6	6.7%	0.3	0.0%	**Low**
4	1,307.4	375.9	28.8%	10.6	0.8%	**Low**
5	431.9	166.3	38.5%	38.9	9.0%	**Low**
6	117.5	25.5	21.7%	0.2	0.2%	**Low**
7	324.9	150.8	46.4%	2.5	0.8%	**Low**

VT #	Flora Study Area (Umwelt, 2025)	Proposed NVCP Permit Area		Proposed Disturbance Footprint (CPS 9911/1 + CPS 10346)		Local Potential Impact
	Hectares	Hectares	%	Hectares	%	
8	191.5	94.3	49.2%	6.0	3.1%	**Low**
9	179.4	46.3	25.8%	18.0	10.0%	**Low**
10	392.8	198.6	50.5%	4.8	1.2%	**Low**
11	34.1	24.6	71.9%	1.7	4.9%	**Low**
12	3,004.4	594.7	19.8%	155.2	5.2%	**Low**
13	1,153.4	428.3	37.1%	75.5	6.5%	**Low**
14	792.9	354.5	44.7%	46.1	5.8%	**Low**
15	65.0	23.3	35.8%	0.3	0.5%	**Low**
16	31.3	29.0	92.8%	0.9	3.0%	**Low**

9.2.1.3 Turner River and Turner River West Clearing

In the east of the Purpose Permit area, the Disturbance Footprint intersects the Turner River (a Minor River), Turner River West (a Major Tributary), and Gillam Creek (a Minor Tributary) to facilitate the construction of a duplicate raw water pipeline, with a proposed clearing corridor across these regional hydrology features of ~20m, adjacent to an existing pipeline that was installed in ~2006. Some clearing will be of regrowth from the existing ~10m wide corridor.

As described in Section 7.6, Groundwater Dependent Vegetation is likely to be present in VT11, which is located at the Turner River and Turner River West. The proposed disturbance includes 1.7ha of VT11 (Table 18) for the purpose of duplicating an existing raw water pipeline.

To limit potential impacts to riparian vegetation and potential Groundwater Dependent Vegetation associated with the Turner River and Turner River West, the footprint of proposed clearing is aligned directly adjacent the existing cleared areas. The proposed disturbance footprint includes previously reported disturbance and cleared area to ensure regrowth that may be considered riparian vegetation is included within the scope of this application.

Aerial imagery of the Turner River and Turner River West from 2016 and 2024 is presented in Figure 26, to present the previous disturbance in these areas and vegetation regrowth.

	14 September 2016	27 June 2024
Turner River West		
Turner River		

Figure 26: Aerial Imagery of Turner River and Turner River West - 2016 and 2024

9.2.1.4 Vegetation Condition

Majority of the proposed NVCP Permit Area is mapped as Excellent condition (Umwelt, 2025).

The proposed extent of disturbance to each vegetation condition by the proposed Disturbance Footprint is presented in Table 19.

Table 19: Direct Impacts – Vegetation Condition

Vegetation Condition	Mapped Extent by Umwelt (2025)		Proposed Disturbance	
	Area (ha)	% of Survey Area	Area (ha)	% of Vegetation Condition to be disturbed
Excellent	11240.3	85.5%	608.1	5.4%
Excellent/Very Good	15.9	0.1%	0.6	3.7%
Very Good	408.6	3.1%	14.9	3.7%
Good	298.2	2.3%	4.9	1.6%
Good/Poor	30.1	0.2%	0.4	1.5%
Poor	37.8	0.3%	2.0	5.3%
Degraded	15.4	0.1%	0.0	0.0%
Rehabilitation	188.1	1.4%	38.9	20.7%
Condition rating not applicable (Disturbed)	916.6	7.0%	35.8	3.9%
Total	**13151.0**	**100%**	**705.7**	**-**

The majority of proposed disturbance will impact vegetation classed as "Excellent" vegetation condition, however this disturbance will only account for 5.4% of total vegetation of this condition within the Survey Area and is considered a low impact.

9.2.2 Scale of Significant Impacts

Based on the above impact assessment in Section 9.2.1, and considering no vegetation unit mapped in the NVCP boundary area at Wodgina comprises conservation significant vegetation as defined by the EPA [(EPA, 2016a) (EPA, 2016b)], the impact of the proposed clearing negligible to vegetation communities within the Permit Area.

9.2.3 Site-Specific Mitigation Measures

There are no site-specific mitigation measures proposed relating to vegetation impacts, other than the standard MinRes mitigation measures described in Section 2.3.

9.3 FLORA IMPACT ASSESSMENT

This section assesses the key impacts relating to flora associated with the proposed disturbance. The key impact pathway for flora is direct loss to conservation significant taxa through clearing.

9.3.1 Clearing Impacts to Conservation Significant Flora

Nine species of significant flora species (including P3 and P4) were recorded by Umwelt (2025), with the following four species intersecting the proposed Disturbance Footprint:

- *Euphorbia clementii (P3)*
- *Euploca mutica (P3)*
- *Terminalia supranitifolia (P3)*
- *Triodia chichesterensis (P3)*

The following three species have been recorded in the Survey Area, however, are not proposed for disturbance:

- *Goodenia obscurata* (P3)
- Gymnanthera cunninghamii (P3)
- *Vigna triodiophila* (P3)

Additionally, two species are listed as potentially undescribed by Umwelt (2025) which occur within the proposed Permit Boundary:

- *Corchorus aff. Incanus* (potentially undescribed)
- *Polymeria sp.* (potentially undescribed)

To assess potential local impacts to significant flora species from the proposed disturbance, the ranking system presented in Table 20 has been adopted. Should local impacts be rated Moderate or High, assessment of regional impacts will be undertaken as described in Umwelt (2022).

Table 20: Scale of Potential Local Impact on Significant Flora Taxa

Ranking of Potential Impact	Description of Impact
Low	<25 % of known local individuals or area of habitat may potentially be impacted.
Moderate	25 - 50 % of known local individuals or area of habitat may potentially be impacted.
High	>50 % of known local individuals or area of habitat may potentially be impacted.

The number of locations and individuals of each of the priority species within the proposed Disturbance Footprint, and consideration to cumulative impacts using estimations from Umwelt (2022), are provided in Table 21.

Of the significant flora taxa within the proposed Disturbance Footprint, impacts to individuals remain below 25% of the known population and is therefore considered a low impact.

Table 21: Impact on Significant Flora Taxa within the proposed Disturbance Footprint

Taxon	Status	Overall Total[1]		Historic Clearing[2]		Proposed Disturbance[3]				Cumulative Disturbance		Ranking of Potential Impact
		Locations	Individuals	Locations	Individuals	Locations		Individuals		Locations	Individuals	
						#	%	#	%	%	%	
Euphorbia clementii	P3	704	63,989	46	606	40	5.7%	530	0.8%	12.2%	1.8%	**Low**
Euploca mutica	P3	235	2,751	0	0	12	5.1%	272	9.9%	5.1%	9.9%	**Low**
Terminalia supranitifolia	P3	1,542	2,903	96	179	62	4.0%	96	3.3%	10.2%	9.5%	**Low**
Triodia chichesterensis	P3	2,832	2,622,729	16	17,012	392	13.8%	306,305	11.7%	14.4%	12.3%	**Low**

[1] As reported by Umwelt (2025) Table 5.7. Includes records from the Survey Area and Regional.

[2] Historically cleared significant flora calculated by Umwelt (2022) using GIS. *Terminalia supranitifolia* historic clearing impact considered worst case scenario.

[3] Includes those cleared under CPS-9911/1 reported in the 2023 AER, approved and proposed CPS-10346 disturbance.

9.3.2 Scale and Significance of Impacts

Based on the impact assessment presented in Section 9.3.1, although the proposed clearing will result in local impacts to priority flora species and further increase fragmentation of the populations, the direct local impacts are considered low.

Provided that the disturbance to the number of individuals is restricted to the amounts identified, the proposed clearing is unlikely to have a significant impact on the long-term viability of the local populations. Therefore, it can be considered that the overall potential significance of impact to P3 Flora species is Low.

9.3.3 Site-Specific Mitigation Measures

The following site-specific management measures are proposed for this application:

- The number of significant flora taxa to be impacted is limited to the number of individuals listed in Table 21.
- The significant flora taxa identified within the proposed Permit Boundary that are not proposed for disturbance (*Goodenia obscurata*, *Gymnanthera cunninghamii*, *Vigna triodiophila*) will be protected by a 10m clearing exclusion buffer on the MinRes internal environmental constraints shapefile layer used to inform LAP assessment (Section 2.3).

There is a record of *Polymeria sp.* (potentially undescribed), a prostrate, creeping herb with long stems that root at the nodes, located within 10m of the proposed Disturbance Footprint. The nearby disturbance is for duplication of a raw water pipeline at the Breccia Borefield to the east of the proposed Permit Boundary. The WA Herbarium has noted that it considers this entity would unlikely be assessed as being of high conservation concern, owing to the wide distribution of collections held by the WA Herbarium (Umwelt, 2025). Clearing will occur within 10m of this record; however, the site will be inspected and the species demarcated to minimise disturbance. A photograph of the species is provided in Figure 27.

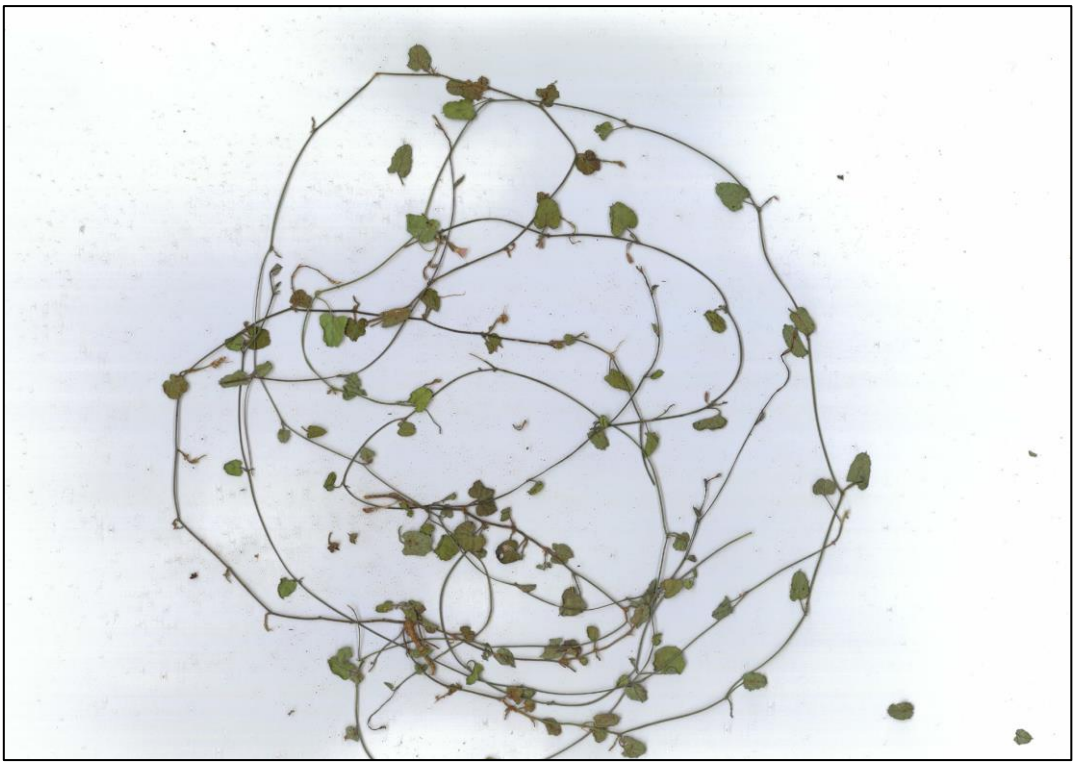


Figure 27: Photograph of *Polymeria sp.* (potentially undescribed) (Umwelt, 2025)

9.4 FAUNA AND HABITAT IMPACT ASSESSMENT

This section assesses the key impacts relating to terrestrial fauna and habitat associated with the proposed disturbance. The key impact pathway from vegetation clearing has been identified as loss of fauna habitat.

9.4.1 Impacts to Terrestrial Fauna Habitat

9.4.1.1 Habitat Mapping

The proposed Disturbance Footprint for this NVCP Application (inclusive of the footprint approved on CPS 10346/1) was assessed alongside historic clearing to assess potential for direct and cumulative impacts of habitat loss. The habitat types and extents used for this assessment are sourced from the Phoenix (2024) surveys and reporting.

The conservation significant fauna recorded at the Project by Phoenix (2024) and their associated habitat types are presented in Table 24.

The direct and cumulative impacts to habitat types are presented in Table 22.

Table 22: Direct and Cumulative Impacts to Habitat Types

Habitat	Extent in the Bioregion	Importance of habitat	Baseline[1]		Baseline habitat reported as disturbed by Phoenix 2024b (2009-2024)		CPS9911/1	CPS 10346				Cumulative	
							CPS9911/1 reported disturbance footprint 2023 AER vs Phoenix 2024b habitat mapping[2]	CPS10346/1 application disturbance footprint vs Phoenix 2024b habitat mapping	Newly Proposed Disturbance (this application)	Proposed for CPS 10346/2		Proposed Cumulative Total Disturbance	Ratio of baseline habitat type disturbed
			Area (ha)	%	Area (ha)	%	Area (ha)	Area (ha)	Area (ha)	Area (ha)	%	Area (ha)	%
Drainage Line	Widespread	**Important**	857.4	6.9%	13.8	1.6%	0.0	4.1	14.4	18.5	2.2%	32.3	3.8%
Ironstone Ridge Top	**Limited**	Limited	372.4	3.0%	144.6	38.8%	0.0	5.6	1.7	7.3	2.0%	151.9	40.8%
Rocky Foothills	Widespread	Limited	3280.0	26.3%	149.0	4.5%	6.3	40.9	43.0	83.9	2.6%	239.2	7.3%
Rocky Ridge and Gorge	**Limited**	**Important**	729.8	5.9%	48.7	6.7%	0.0	13.6	1.1	14.7	2.0%	63.4	8.7%
Spinifex Sandplain	Widespread	Limited	1387.7	11.1%	109.8	7.9%	0.0	0.0	49.6	49.6	3.6%	159.4	11.5%
Spinifex Stony Plain	Widespread	Limited	5662.9	45.4%	116.7	2.1%	0.3	200.3	146.1	346.5	6.1%	463.4	8.2%
Stony Rises	Widespread	Limited	170.0	1.4%	1.0	0.6%	0.0	2.2	22.7	24.9	14.7%	25.9	15.2%
Total			**12460.3**	**100%**	**583.6**	**4.7%**	**-**	**-**	**-**	**-**	**4.4%**	**1135.6**	**9.1%**

[1] Equates to Phoenix (2024b) habitat mapping, plus the baseline habitat from Western Wildlife (2020) now reported as disturbed by Phoenix (2024b).

[2] This is a comparison of the reported footprint from the 2023 NVCP Annual Report against the habitat mapping by Phoenix (2024b), and not representative of actual clearing impacts. Refer to the 2023 NVCP Annual Report for this information.

Note: Clearing under CPS8068-1 for the gas pipeline is excluded from this assessment. This clearing was included in Section 4.1 for assessment against the 2018 EPBC referral.

9.4.1.2 Bat Roost Habitat

A review of the Ghost bat and PLNB roosts within the survey area was undertaken to assign categories based on significance (Section 8.2.1.1) and apply suitable management measures. The management measures include:

- Ghost Bat Roosts:
  - Category 1, Category 2 and nearby Category 3 caves (apartment blocks) include a 200m exclusion zone.
  - Isolated Category 3 caves include a 100m exclusion zone.
- Pilbara Leaf-nose Bat
  - Category 3 caves include a 200m exclusion zone.
  - Category 3 caves include a 500m conditional zone which prevents mining activities capable of excessive noise and vibration (drill and blast, waste rock dumps, processing).

The above management measures are in line with Bat Call WA (2021a; 2021b), are considered conservative, and can be reduced if sufficient technical supporting studies demonstrate buffers can be reduced (e.g. vibration or noise assessments). Relevant approvals will be sought if changes to the above management measures are proposed.

The proposed exclusion zones are presented in Figure 28.

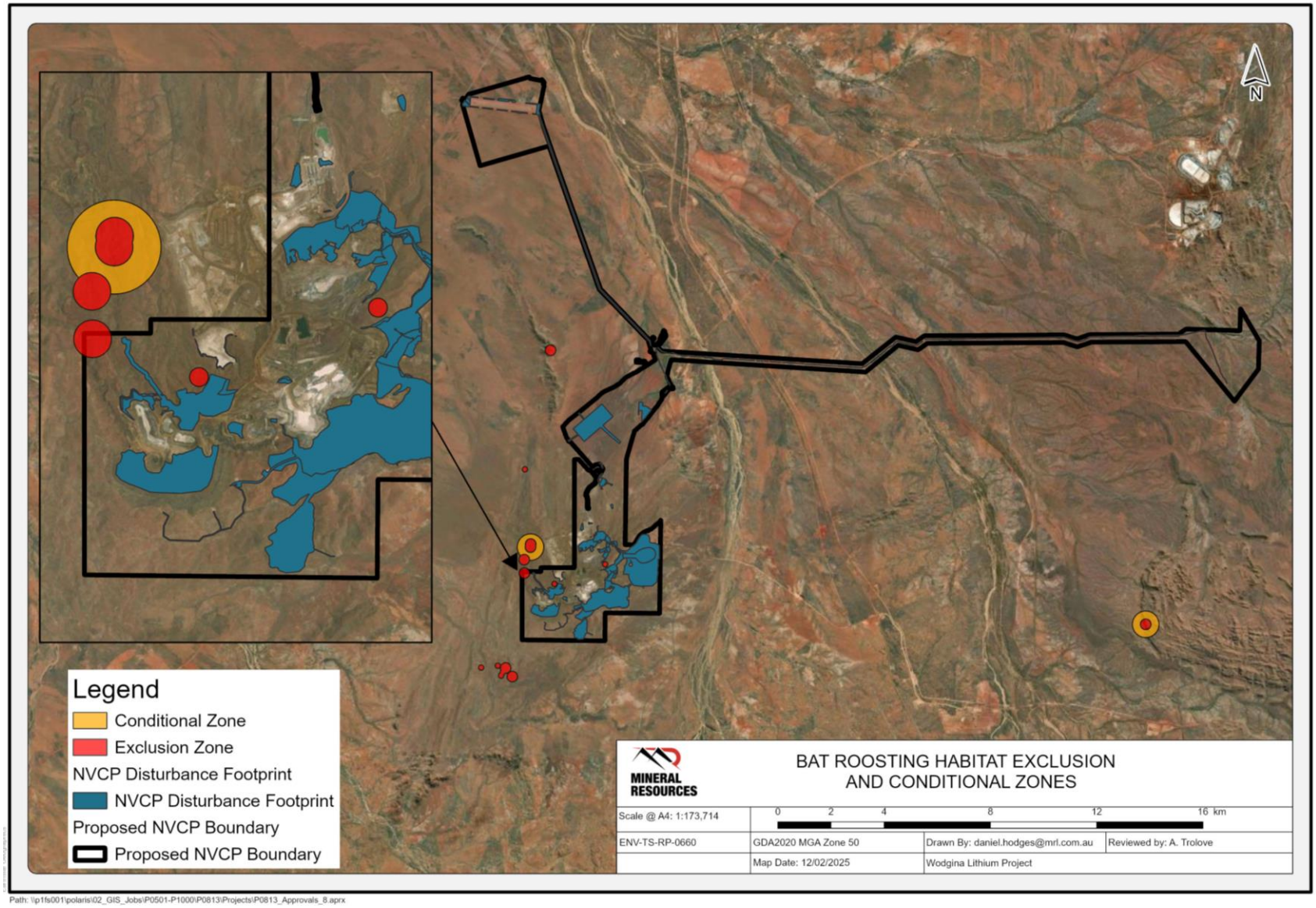


Figure 28: Map of Bat Roosting Habitat Exclusion and Conditional Zones

9.4.2 Scale and Significance of Impacts

The system for determining significance of impact has been replicated from Umwelt (2022), which was determined as High, Moderate or Low as defined in Table 23.

Table 23: Risk Rating of Significant Impacts to Fauna

Risk of significant impact	Description	Example
Low	Low risk of a significant impact on the species.	Species infrequently occurs; no critical habitat is present or likely to be impacted; indirect impacts are few or none.
Moderate	Moderate risk of a significant impact on the species.	Species is recorded or likely to be present; only supporting habitats present or little impact on critical habitat if present; may be some indirect impacts on populations or habitats.
High	High risk of a significant impact on the species.	An important population of the species is known to be present; the project is likely to result in loss of critical habitat; indirect impacts are likely to have a large impact on the local population or on critical habitat.

Key to determining the risk of a significant impact is identifying the importance of the local population of the species and identifying habitat critical to the survival of the species.

An 'important population' is one that is necessary for the long-term survival and recovery of the species (DoE 2013). This may include key source populations, populations on the edge of the species range and/or populations important for maintaining genetic diversity. This may include a geographically distinct regional population, or collection of local populations, or a population, or collection of local populations that occurs within a particular bioregion.

'Habitat critical to the survival of the species' is defined by DoE (2013) as areas that are necessary for activities such as breeding, foraging, roosting or dispersal, areas necessary for the long-term maintenance of the species, areas necessary for maintaining genetic diversity and/or areas necessary for the reintroduction of population or recovery of the species.

The impacts to habitats described in Section 9.4.1.1 have been considered in the context of the conservation significant species recorded by Phoenix (2024).

Table 24: Summary of Potential Impacts to Conservation Significant Fauna Species

Species	Scale of Impact
Northern Quoll (*Dasyurus hallucatus*) (VU)	**Moderate** Loss of 14.7 ha of Rocky Ridge and Gorge shelter and breeding habitat, and 530.7 ha of foraging and dispersal habitat (i.e. all remaining native vegetation in the disturbance footprint). The loss of shelter and breeding habitat is likely to be permanent, as it is difficult to re-create with rehabilitation. There may also be a temporary impact on individuals through direct mortality of individuals sheltering in rocky habitats during clearing and/or road mortalities during night shift operations. However, the reduction in population size is unlikely to prevent the long-term persistence of the species in the rocky range at Wodgina. The proposed disturbance under CPS-10346 is 2.0% of mapped Rocky ridge and gorge from mapped habitat in 2009. Cumulative disturbance since 2009 is 63.4 ha, or 8.7% of mapped Rocky ridge and gorge in 2009.

Species	Scale of Impact
	The extent of proposed clearing of Rocky ridge and gorge remains 3.7 ha below that referred under the EPBC Act which was not a controlled action (EPBC 2018/8194) (Section 4.1). Drainage habitat disturbance does exceed the amount referred under the EPBC Act by 3.6 ha, however this habitat type is widespread throughout the region and total proposed cumulative clearing of this habitat within the survey area is 3.8%, which is not considered significant.
Ghost Bat (*Macroderma gigas*) (VU)	**Low** A total of 14.7 ha of Rocky Ridge and Gorge habitat will be lost; however, no known roost sites will be lost as all significant roosts (Category 1, 2 and 3) are protected with exclusion zones. The proposed disturbance under CPS-10346 is 2.0% of mapped Rocky ridge and gorge from remaining habitat in 2009. Cumulative disturbance since 2009 is 63.4 ha, or 8.7% of mapped Rocky ridge and gorge within the survey area. A Category 1 roost is located approximately 1 km from the NVCP Permit Boundary. Loss of foraging habitat will occur. Although this species is not specific in its foraging habitat requirements, the foraging habitat lost is within 3 km of known diurnal roost sites. There may also be some temporary population decline due to loss of individuals to vehicle mortalities. A reduction in population size due to proposed clearing activities is considered unlikely.
Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (VU)	**Low** Although 14.7 ha of Rocky Ridge and Gorge habitat will be cleared, this area has been subject to targeted survey and no diurnal roosting caves were found or considered likely to occur inside the NVCP boundary area (Section 8.2.1.1). The proposed disturbance under CPS-10346 is 2.0% of mapped Rocky ridge and gorge from remaining habitat in 2009. Cumulative disturbance since 2009 is 63.4 ha, or 8.7% of mapped Rocky ridge and gorge within the survey area. The nearest known Category 3 roost is located approximately 1 km from the Permit Boundary. Despite being located near the Wodgina DSO disturbance footprint, bat activity at this cave has been consistent during monitoring 2012 – 2018 ((Biologic, 2018)). Loss of 5.63 ha of Drainage Line foraging habitat, and road mortalities may have a temporary impact on the local foraging population. As A reduction in population size due to proposed clearing activities is considered unlikely.
Greater Bilby (*Macrotis lagotis*) (VU)	**Low** Greater Bilby have a moving home range which can vary considerably in size between locations. There is no critical habitat defined for the Greater Bilby. Survey evidence suggests Greater Bilby utilise the Spinifex sandplain habitat and areas of major drainage in the study area, with the most recent evidence located along the Infrastructure Corridor. Due to the scarcity of evidence, they are likely either sparsely distributed, in very low numbers or intermittently present where the study area forms part of the species broader moving home range. Other fauna habitats within the study area boasting a spinifex-dominated vegetation assemblage with a rocky stratum are unlikely to support Greater Bilby. Suitable Greater Bilby habitat is widespread in the region. A reduction in population size due to proposed clearing activities is considered unlikely.
Rufous Grasswren	**Low**

Species	Scale of Impact
(*Amytornis whitei subsp. Whitei*) (P4)	There is no critical habitat listed for the Rufous Grasswren. Suitable habitat in the study area comprises Rocky ridge and gorge, and Rock foothills. They are likely to be frequently present in the study area; however, are expected to occur in low numbers. The species is not restricted to the study area, and suitable spinifex-vegetated ridgelines occur extensively within the immediate regions surrounding the study area. A reduction in population size due to proposed clearing activities is considered unlikely.
Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4)	**Low** Although 353.7 ha of suitable habitat will be lost (346.5 ha of Spinifex Stony Plains and 7.3 ha of Ironstone Ridgetop), this is unlikely to impact populations of this species on a regional level. The proposed disturbance to Spinifex Stony Plains is 6.1% of the total mapped within the survey area and is widespread throughout the bioregion. Adjacent habitat within the Fauna Study Area is likely to continue to support this species, and the remaining population is likely to persist in the long-term.

Based on the above assessment, the potential impacts associated with clearing of native vegetation under this application are considered unlikely to result in a long-term impact to populations of conservation significant species at a local or regional level, fragment the population or impact critical ecological functions and breeding cycles in the local or regional environments.

9.4.3 Site-Specific Mitigation Measures

The site-specific management measures associated with disturbance to significant habitat types include:

- Rocky ridge and gorge habitat disturbance is limited to 14.7ha (as mapped by Phoenix (2024)).
- Drainage line habitat disturbance is limited to 18.5 ha (as mapped by Phoenix (2024)).
- Exclusion zones around significant roosts (Category 1, 2 and 3) of Ghost bat and PLNB will be implemented.

9.5 LAND DEGRADATION IMPACT ASSESSMENT

Land degradation caused by land clearing and associated activities can cause changes in soil health and landscape functionality including salinity, erosion, acidification, and contamination. This has the potential to ultimately alter the fundamental ability of the land to support biodiversity, ecological processes, conservation significant species, as well as cultural values, anthropogenic uses, and economic growth (EPA, 2007). The land characteristics are summarised below:

- The land proposed to be cleared under this NVCP Application has a very high capability to be utilised for the final land use of mining and associated activities with a low risk to land degradation.
- The proposed Disturbance Footprint is optimised and restricted to areas required for the Mine Plan expansion. Staged clearing will ensure open areas are minimised.
- The physical and chemical characteristics of soils and shallow geology across the proposed NVCP Permit Area identified in Section 6 indicates the following:
    - Soil characteristics provide stability against wind and water erosion and have a reduced water storage capacity.
    - Hard geology close to surface provides stability and reduces the risk of deep soil compaction and/or water logging.
    - Soil samples indicated on average natural levels of soil acidity, alkalinity, and salinity.

- Specific recommendations and rehabilitation targets for different soil types will ensure the most successful revegetation outcomes. Areas that are cleared will be undertaken in a staged approach to ensure development of the area occurs immediately reducing the potential for any wind or water erosion impacts. Due to cleared areas being completed developed and utilised there will be no open soil resources to potentially lead to areas of acidification or salinity.
- Surface water flood modelling has been undertaken to ensure that ephemeral streams through the NVCP Permit Area can be maintained. Drainage controls will be implemented as required.

The likelihood of a significant impact to the existing land condition from the proposed works is low.

9.6 HYDROLOGICAL IMPACT ASSESSMENT

Clearing can alter the local hydrological regime of an area through direct and indirect impacts. Disturbance to existing water courses or wetlands can significantly reduce the biodiversity and ecological functions of the landscape and trigger changes to groundwater levels and potential impacts to vegetation dependent on groundwater levels. The hydrological environment is summarised below:

- The very tight geology and low permeability in the geology at the Project, and the depth to groundwater in the ridgeline areas, indicate that small influences such as clearing will not impact the groundwater environment. Clearing is not anticipated to cause fluctuations in the water table level.
- There are several ephemeral drainage lines running through the proposed Permit Area and in areas these will be cleared and developed. Surface water flood modelling has been undertaken to ensure that ephemeral streams through the NVCP Permit Area can be maintained. Drainage controls will be implemented as required.

The risk of significant impact to the existing hydrological landscape is therefore Low.

9.7 DRAFT CLEARING LIMIT CONDITIONS

This section provides draft conditions which consider the proposed clearing against the existing conditions relating to direct impacts (Conditions 3, 4 and 9) under CPS 10346/1. To allow for simplified implementation and assessment of compliance, the below draft conditions are directly comparable to the spatial data of:

- Fauna habitat mapping - Phoenix (2024)
- Significant Flora Taxa –Umwelt (2025), which includes surveys in 2023 and 2024, plus the pre-2023 surveys reported in Woodman (2020).

The draft conditions, with comparison to the existing conditions of CPS-10346/1, are presented in Table 25.

The total cleared area reported under CPS-9911/1 in 2023, which was 51.1ha, is excluded in the total clearing amount for the draft Condition 3 or included in draft Condition 4.

Draft Condition 9 includes the clearing reported under CPS-9911/1 in 2023 due to the wording of the current condition. These values could be revised to exclude the CPS 9911/1 2023 clearing impacts to priority flora.

The draft figure to replace Schedule 1 Figure 1 of CPS-10346/1 is provided as Figure 29.

Table 25: Draft Conditions with Comparison to CPS-10346/1 Conditions

CPS-10346/1 Condition	Draft Condition
3. Area of clearing The Permit Holder must not clear more than 448.36 hectares of native vegetation within the areas cross-hatched yellow, shaded purple and shaded green in Figure 1 of Schedule 1.	**3. Area of clearing** The Permit Holder must not clear more than 683.8 hectares of native vegetation within the areas cross-hatched yellow, shaded purple and shaded green in Figure 1 of Schedule 1.
4. Clearing Restriction The Permit Holder shall not clear: a. native vegetation within the areas shaded red in Figure 1 of Schedule 1; b. more than 20.2 hectares of native vegetation within the areas shaded purple in Figure 1 of Schedule 1; and c. more than 8.04 hectares of native vegetation within the areas shaded green in Figure 1 of Schedule 1.	**4. Clearing Restriction** The Permit Holder shall not clear: a. native vegetation within the areas shaded red in Figure 1 of Schedule 1; b. more than 14.7 hectares of native vegetation within the areas shaded purple in Figure 1 of Schedule 1; and c. more than 18.5 hectares of native vegetation within the areas shaded green in Figure 1 of Schedule 1.
9. Flora management Where the priority flora species *Euphorbia clementii*, *Triodia chichesterensis*, *Terminalia supranitifolia* and, *Vigna triodiophila* have been identified and their written locations provided to the CEO, within report 'Wodgina Lithium Project: Detailed Flora and Vegetation Assessment. Report prepared for Mineral Resources Limited by Woodman Environmental Consulting Pty Ltd, April 2020' as retained on DEMIRS file DMS11672//2023 as Doc ID A67290870, the Permit Holder shall ensure that: • no clearing within 10 metres of the identified *Euphorbia clementii* and *Vigna triodiophila*, unless first approved by the CEO; • no greater than 69 individuals of *Terminalia supranitifolia* are impacted; and • no greater than 101,215 individuals of *Triodia chichesterensis* are impacted.	**9. Flora management** Where the priority flora species *Euphorbia clementii*, *Euploca mutica*, *Terminalia supranitifolia*, *Triodia chichesterensis*, *Goodenia obscurata*, *Gymnanthera cunninghamii*, and *Vigna triodiophila* have been identified and their written locations provided to the CEO, within report 'Flora and Vegetation Assessment - Wodgina Lithium Project. Report prepared for Mineral Resources Limited by Umwelt (Australia) Pty. Ltd, February 2025', the Permit Holder shall ensure that: • no clearing within 10 metres of the identified *Goodenia obscurata, Gymnanthera cunninghamii*, and *Vigna triodiophila*, unless first approved by the CEO; • no greater than 530 individuals of *Euphorbia clementii* are impacted; • no greater than 272 individuals of *Euploca mutica* are impacted; • no greater than 96 individuals of *Terminalia supranitifolia* are impacted; • no greater than 306,305 individuals of *Triodia chichesterensis* are impacted.

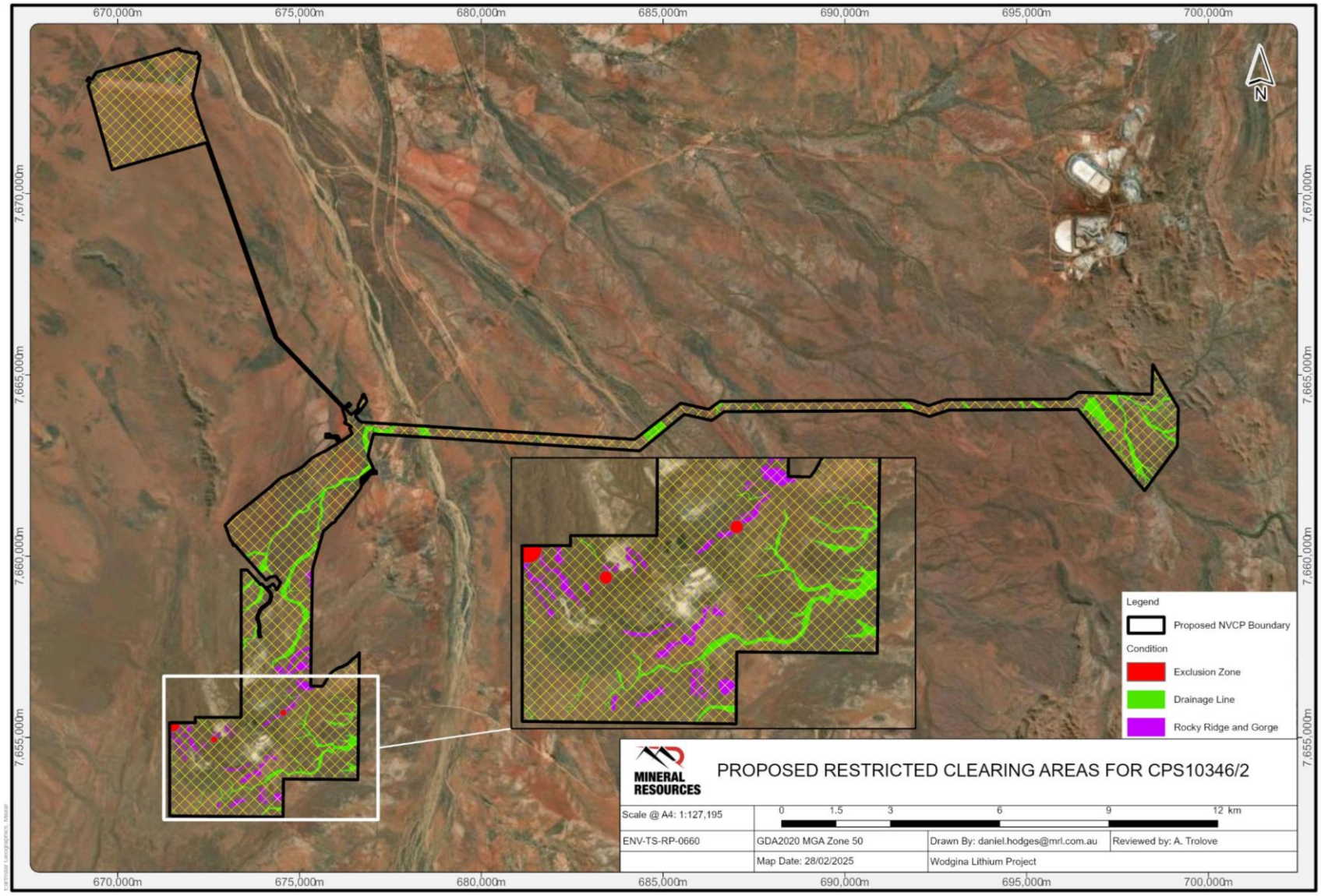


Figure 29: Map of Proposed Restricted Clearing Areas for CPS-10346/2

10. ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

An assessment has been completed against the Ten Clearing Principles (EP Act 1986, Schedule 5) to determine if there is a likely significant environmental impact as a result of the clearing native vegetation for the purposes of this project, within the proposed application area.

Each principle was assessed in accordance with Department of Environmental Regulation's (DER) "A Guide to the Assessment of Applications to Clear Native Vegetation" (DER, 2014).

In summary, the proposed NVCP Application is not at variance or not likely to be at variance (green) with nine out of ten Clearing Principles.

Clearing Principle B may be to variance due to the potential impact to Northern Quoll due to the loss of shelter and breeding habitat is likely to be permanent, as it is difficult to re-create with rehabilitation. However, the reduction in population size is unlikely to prevent the long-term persistence of the species in the rocky range at Wodgina.

A full assessment of the proposed NVCP Application against the Clearing Principles is shown in Table 26.

Table 26: Assessment of Variance with Clearing Principles

Clearing Principle	Assessment against Clearing Principle	Variance Status
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle A: • There are no Environmentally Sensitive Areas (ESAs) or DBCA managed reserves or conservation areas within the proposed NVCP Permit Area or in proximity to the Wodgina Project. The closed DBCA managed Nature Reserve is the Mungaroona Range Natural Reserve (DWER, 2021). The Reserve is 'Class A' and covers approximately 105,842 ha is located 50 km to the South West of the Project. • No Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) have been identified within the proposed NVCP Permit Area or wider Wodgina area. • No Declared Rare Flora has been identified within the proposed NVCP Permit Area or wider Wodgina area. • No Wild Rivers or Wetlands of conservation significance (locally or nationally) are within the proposed NVCP Area or in proximity to the Wodgina Project. • Potential GDV or riparian vegetation have been identified occur within the NVCP Permit Area, however impacts are considered negligible. • Extensive survey effort has been undertaken across the proposed Disturbance Footprint to identify potential conservation significant species. • Nine priority species are located within the proposed NVCP Disturbance Footprint; however, impacts to these species are considered low. • 16 VTs are mapped within the proposed NVCP Area, none represent State or Commonwealth listed significant vegetation. • A total of 400 discrete vascular flora taxa (including 14 introduced taxa), three known hybrids and seven putative hybrids have been recorded in the Study Area. These taxa and hybrids represent 58 families and 156 genera. The most well-represented families were Fabaceae (70 taxa), two known hybrids and seven putative hybrids), Poaceae (67 taxa) and Malvaceae (41 taxa) (Umwelt, 2025). • Vegetation condition mapping indicates 11,240.3 ha of vegetation within the proposed NVCP Permit Area is Excellent, followed by 15.9 ha of Excellent/Very Good, 408.6 ha of Very Good, 299 ha of Good Vegetation Condition. • Vegetation condition mapping indicates 608.1 ha of vegetation within the proposed NVCP Permit Footprint is Excellent, followed by 0.6 ha of Excellent/Very Good, 14.9 ha of Very Good, 4.9 ha of Good Vegetation Condition.	**Not likely to be or not at variance**

Clearing Principle	Assessment against Clearing Principle	Variance Status
	• Fifteen (15) weed species have been identified in the proposed NVCP Permit Area including Declared Weed *Calotropis procera* and *Opuntia sp*. • The fauna assemblage as likely to be diverse as the Study Area contains a range of habitats, though many of the species that occur are widely distributed through arid Australia. The desktop review identified records of 402 vertebrate taxa within the desktop search extent. The list comprised 10 frogs, 119 reptiles, 217 birds (including one naturalised species) and 56 mammals (including 10 introduced) (Umwelt, 2025). • No anticipated impacts to SRE. • Six (6) conservation significant fauna species were recorded by Phoenix (2024) within the wider Fauna Study Area. Refer to Principle (b) for more information. • No significant impacts are anticipated on conservation significant fauna species. Given the above information, and mitigation measures outlined in Section 2.3 and 9 the proposed NVCP Application is expected to be of minimal risk to biodiversity values and therefore is not likely to be at variance to this Principle.	
(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 indigenous to Western Australia.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle B: Six conservation significant fauna species may occur within the wider Fauna Study Area, including: • Northern Quoll (*Dasyurus hallucatus*) - the potential impact to the Northern Quoll is assessed to be Moderate due to the presence of the population at the Project being defined as an 'Important population' by DoE guidelines (2016) regardless of low population numbers and/or the lack of denning evidence. Habitat for the Northern Quoll is the Rocky Ridge and Gorge Habitat which is "refuge-dense" and cane-toad free habitat. Such habitat is defined as 'habitat critical to the survival of the species' by DoE (2016) due to it containing rocky habitats, dispersal and foraging habitats. Supported by historic records of conservation significant fauna species, the Rocky Ridge and Gorge Habitat associated with the land system provides connectivity across the project area and surrounding environment, allowing for migration and dispersion of these key fauna species across the wider region. There will be some impact to a small percentage of the key habitats due to the footprint of the Project infrastructure. • Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) – the potential impact to the PLNB is considered Low although the population is potentially "Important" due to gene flow in the region. No Category 1, Category 2 or Category 3 roosts have been identified	**May be at variance**

Clearing Principle	Assessment against Clearing Principle	Variance Status
	within the proposed NVCP Permit Area. Recent survey effort (Stantec 2022) recorded PLNB a small number of bats utilising the area for foraging. A number of caves in the proposed NVCP Permit Area are classed as Category 4, which are not considered significant habitat. • Ghost Bat (*Macroderma gigas*) – the potential impact to the Ghost Bat is considered to be Low. Conditional areas restricting clearing identified as buffer areas surrounding critical bat habitat that occur within the NVCP Application area or in close proximity including: • Category 1, Category 2 and nearby Category 3 caves (apartment blocks) include a 200m exclusion zone. o Isolated Category 3 caves include a 100m exclusion zone. • The proposed activities will be located no closer to identified bat caves than permitted under current approvals. Accordingly, there will be no additional impacts to the bat caves for the activities under this NVCP application. • Greater Bilby (Macrotis lagotis) – the potential impact to the Greater Bilby is considered to be Low. Survey evidence suggests Greater Bilby utilise the Spinifex sandplain habitat and areas of major drainage in the study area. Due to the scarcity of evidence, they are likely either sparsely distributed, in very low numbers or intermittently present where the study area forms part of the species broader moving home range. Other fauna habitats within the study area boasting a spinifex-dominated vegetation assemblage with a rocky stratum are unlikely to support Greater Bilby. Suitable Greater Bilby habitat is widespread in the region. • Rufous Grasswren (*Amytornis whitei subsp. whitei*) – the potential impact to the Rufous Grasswren is considered to be Low. The species is not restricted to the study area, and suitable spinifex-vegetated ridgelines occur extensively within the immediate regions surrounding the study area. A reduction in population size due to proposed clearing activities is considered unlikely. • Western Pebble-mound Mouse ((*Pseudomys chapmani*) – the potential impact is considered to be Low. Adjacent habitat within the Fauna Study Area is likely to continue to support this species, and the remaining population is likely to persist in the long-term. Given the above information, and management measures outlined in Section 2.3 and 9, the proposed NVCP Application is expected to be of minimal risk to significant habitat values however due to the DoE guidelines for an 'Important' population or 'Critical' habitat therefore and may be at variance to this Principle.	

Clearing Principle	Assessment against Clearing Principle	Variance Status
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle C: • No Threatened or Declared Rare Flora listed under the BC Act have been identified within the proposed NVCP Permit Area. One threatened flora species (*Quoya zonalis*) was recorded by Umwelt (2025), however is approximately 8 km from the NVCP Permit Area. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is expected to be of no risk to rare flora values and therefore is not at variance to this Principle.	**Not likely to be or not at variance**
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.	The proposed clearing area does not contain species representative of a TEC listed under the BC Act or EPBC Act. • The proposed NVCP Permit Area falls within the Abydos Plan Chichester 93 and 626 vegetation system associations, both of which are relatively intact and widespread with over 99% Pre-European Extent remaining. The proposed Disturbance Footprint will not reduce the percentage of Pre-European Extent below 99% remaining. • A total of 16 Vegetation Types (VT) were identified across the Flora Study Area, none of which represent State or Commonwealth listed Communities or significant vegetation otherwise defined by the EPA (EPA 2016a). • There are no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within the proposed NVCP Permit Area, or within the wider Flora Study Area. • The closest significant vegetation unit is the PEC Gregory Land System identified (P3) located approximately 8 km northwest of the proposed NVCP Permit Area. The proposed disturbance will not impact this PEC. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	**Not likely to be or not at variance**
(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.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle E: • The proposed NVCP Permit Area falls within the Abydos Plan Chichester 93 and 626 vegetation system associations, both of which are relatively intact and widespread with over 99% Pre-European Extent remaining.	**Not likely to be or not at variance**

Clearing Principle	Assessment against Clearing Principle	Variance Status
	• The proposed Disturbance Footprint will not reduce the percentage of the pre-European Extent of Vegetation Systems Abydos Plan Chichester 93 and 626 below 99%. • A total of 16 Vegetation Types (VT) were identified across the Flora Study Area, none of which represent State or Commonwealth listed Communities or significant vegetation otherwise defined by the EPA (EPA 2016a). • Vegetation condition mapping indicates 608.1 ha of vegetation within the proposed NVCP Permit Footprint is Excellent, followed by 0.6 ha of Excellent/Very Good, 14.9 ha of Very Good, 4.9 ha of Good Vegetation Condition. • Mine development is focused on existing cleared areas and, where necessary, clearing of vegetation in the immediate surrounding areas to reduce unnecessary clearing and/or impacts. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle F: • The proposed NVCP Permit Area, nor the wider Wodgina Project, does not fall within a RAMSAR or nationally significant mapped wetland. • The wider Wodgina Project does fall within the Wild River Catchment identified as the Upper Yule River however this catchment has been downgraded due to the catchment and waterway being assessed as not in near pristine condition. • Proposed clearing includes 1.7 ha of VT11 which Umwelt (2025), describes as including GDV. To minimise potential impacts, as described in Section 9.2.1.3, the proposed clearing targets previously cleared areas with regrowth and a 10m wide corridor directly adjacent this previous clearing. • Ephemeral water sources defined by the Drainage line habitat will be managed as required through surface water and flood modelling, and the implementation of adequate surface water controls. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	**Not likely to be or not at variance**
(g) Native vegetation should not be cleared if the clearing of the vegetation	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle G:	**Not likely to be or not at variance**

Clearing Principle	Assessment against Clearing Principle	Variance Status
is likely to cause appreciable land degradation.	• The landscape of the proposed Disturbance Footprint is comprised by rocky outcrops, and soils characterised by stony lag cover and gravel components of the soil strata providing stability for future rehabilitation works. • Some dispersive material is identified within the proposed Disturbance Footprint and this material will be stockpiled to ensure minimal wind or water erosion. • Soils generally have a low water storage capacity reducing the changes of water logging. • Soils (on average) have natural levels of acidity, alkalinity, and salinity. • Flood modelling work across ephemeral drainage lines will indicate where surface water controls need to be implemented to reduce potential erosion. • Proposed Disturbance Footprint is restricted to the smallest and optimised design to ensure no over clearing occurs. • Staged clearing will ensure open areas are developed into the final land use as soon as possible and reduce open areas. • Declared weeds will be managed as outlined in Section 7.7 to reduce potential of spread by proposed clearing activities. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle H: • There are no Environmentally Sensitive Areas (ESAs) within or in proximity to the proposed NVCP Permit Area. • The closest DBCA managed Nature Reserve is the Mungaroona Range Natural Reserve. The Reserve is 'class A' and covers approximately 105,842 ha is located 50 km to the Southwest of the Project. • There are no Schedule 1 areas as defined by the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 within or in proximity to the proposed NVCP Permit Area. • The proposed NVCP Application does not fall within, or in proximity to, an active Wild Rivers catchment. • No RAMSAR, EPA Redbook or nationally significant watercourses or wetlands within or in proximity to the proposed NVCP Permit Area.	**Not likely to be or not at variance**

Clearing Principle	Assessment against Clearing Principle	Variance Status
	• No Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) within the proposed NVCP Permit Area. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	
(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.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle I: • The proposed NVCP Permit Area does not occur within a PDWSA. • The proposed NVCP Permit Area does not intersect any significant or permanent watercourses. • The proposed NVCP Permit Area does not fall within any wetlands. • Erosion of the proposed Disturbance Footprint is not anticipated therefore risk of downstream sedimentation of ephemeral drainage line is low. • Any potential contamination from mining activities will be appropriately managed through spill response procedures and remediation (where required). • Disturbance footprints for mining activities will be confined to the proposed Disturbance Footprint and delineated from areas native vegetation via windrows and other hard controls. • Groundwater quality is generally circum-neutral and of a marginal to brackish salinity. • Bedrock geology is very tight around the ridgeline bedrock and surrounding areas therefore potential impacts to groundwater systems is expected to be low due to reduced, and very slow, groundwater movement. • Surface water flows are ephemeral and only occur after periods of extended rainfall, generally in the wet season therefore potential for contamination is Low. • Flood modelling work across ephemeral drainage lines will indicate where surface water controls need to be implemented to reduce potential quality deterioration. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	**Not likely to be or not at variance**
(j). Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	Summary of key information submitted in this NVCP Application to support the assessment against Clearing Principle J: • A portion of the proposed NVCP Application is located on a peneplain downstream from an extensive ridgeline with a number of ephemeral drainage lines.	**Not likely to be or not at variance**

Clearing Principle	Assessment against Clearing Principle	Variance Status
	• Typically, flash flooding events after short intense rain events is matched by quick infiltration rates due to typical hot dry conditions and soil types. • Flood modelling work across ephemeral drainage lines will indicate where surface water controls need to be implemented to reduce potential quality deterioration. • Modelling of the 1% AEP demonstrate some expected ponding against landforms however no significant changes to natural flood modelling of the region. • There are several non-perennial watercourses within the application area and no permanent waterbodies. 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. Given the above information, and management measures outlined in Section 2.3, the proposed NVCP Application is not at variance to this Principle.	

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MINERAL RESOURCES LIMITED

20 Walters Drive
Osborne Park WA 6017

Locked Bag 13, Osborne Park DC, WA 6916

T +61 8 9329 3600
E reception@mineralresources.com.au | W www.mrl.com.au