MINERAL RESOURCES

NVCP SUPPORTING DOCUMENT

LAMB CREEK IRON ORE PROJECT – SITE-WIDE NVCP

M47/1592, L47/1008

11 APRIL 2025 VERSION [00]

DOCUMENT INFORMATION

The purpose of this document is to provide supporting information for PMI's application for a Native Vegetation Clearing Permit (NVCP) and addresses the requirements as prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.*

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Revision History

Rev	Issue Date	Prepared by	Reviewed By	Approved By	Document Purpose
[00]	23/05/2023	Michelle Davies	Sonja Puglisi	Peter Tapsell	Native Vegetation Clearing Permit
[00]	[Choose date]	[Enter name/s]	[Enter name/s]	[Enter name/s]	[Enter text]
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[00]	[Choose date]	[Enter name/s]	[Enter name/s]	[Enter name/s]	[Enter text]

Approvals

Version	Date	Comments	Approved by
[00]	4/04/2025	for agency submission	C. Mangan
[00]	[Choose date]	[Enter text]	[Enter name/s]
[00]	[Choose date]	[Enter text]	[Enter name/s]
[00]	[Choose date]	[Enter text]	[Enter name/s]

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 acknowledge and respect Aboriginal and Torres Strait Islander peoples as the traditional custodians of the land.

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ABBREVIATIONS

Abbreviation	Definition
ACN	Australian Company Number
AEP	Annual Exceedance Probability
AHIS	Aboriginal Heritage Inquiry System
ASS	Acid Sulphate Soils
BC Act	*Biodiversity Conservation Act 2016*
BIF	Banded Iron Formation
BNTAC	Banjima Native Title Aboriginal Corporation RNTBC
BOM	Bureau of Meteorology
CALM Act	*Conservation and Land Management Act 1984 (WA)*
CEMP	Construction Environmental Management Plan
CID	Channel Iron Deposits
C:N	Carbon to Nitrogen
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DBCA	Department of Biodiversity, Conservation and Attractions (WA)
DEC	Department of Conservation (WA) now DWER
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety (WA), formerly DMIRS
DMIRS	Department of Mines, Industry Regulation and Safety (WA), now DEMIRS
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environmental Regulation (WA)
ECEC	Effective cation exchange capacity
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
FVMP	Flora and Vegetation Management Plan
GWOS	Groundwater Operating Strategy
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
LCIOP	Lamb Creek Iron Ore Project
km	Kilometre
LGA	Local Government Area
LAP	Land Activity Permit

m	Metre
mbgl	Metres below ground level
MCP	Mine Closure Plan
MHERC	Mineral Resources Heritage, Environment Reference Committee (Banjima People)
MIB	Martidja Banyjima
MNES	Matters of National Environmental Significance
MinRes	Mineral Resources Limited
NAFI	Northern Australia Fire Information
NVCP	Native Vegetation Clearing Permit
OEMP	Operations Environmental Management Plan
P2	Priority 2
PAF	Potentially Acid Forming
PEC	Priority Ecological Community
PMI	Process Minerals International
RIWI Act	*Rights in Water and Irrigation Act 1914*
RL	Reduced Level
RoM	Run of Mine
SFMP	Significant Fauna Management Plan
SRE	Short-range Endemic
SWL	Standing Water Level
SWMP	Surface Water Management Plan
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
WA	Western Australia
WAH	Western Australian Herbarium
WRL	Waste Rock Landform

1. INTRODUCTION

The Proponent, Process Minerals International (PMI), a wholly owned subsidiary of Mineral Resources Limited (MinRes) (ACN 118 549 910), proposes to develop the Lamb Creek Iron Ore Project (LCIOP) (the Proposal) located approximately 130 kilometres (km) northwest of Newman via the Great Northern Highway (**Figure 1**), in the East Pilbara Local Government Authority (LGA) in Western Australia (WA).

PMI seeks approval to clear native vegetation under Part V of the *Environmental Protection Act 1986* (EP Act) on mining tenements M47/1592 (pending conversion from R47/19) and L47/1008 to facilitate the Project's resource development. PMI has applications for mining leases over all tenements and seeks to clear up to 638.4 hectares (ha) within an 860.9 ha Purpose Permit Area located on these tenements.

1.1 Purpose

The purpose of this document is to provide supporting information for PMI's application for a Native Vegetation Clearing Permit (NVCP) and address the requirements as prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.*

This document provides a holistic assessment of the Project based on ecological studies within and in proximity to the Proposed Clearing Footprint and includes assessment of the Project against the 10 Clearing Principles (the Clearing Principles), as defined in Schedule 5 of the *Environmental Protection Act 1986* (EP Act).

This NVCP application supporting document is structured to provide the following information:

- description and map of the area proposed for clearing in regard to location, size and purpose;
- site overview with a brief description of local climate, biogeographic region, geology, land use and land systems, soils, hydrology and hydrogeology;
- description of the area to be cleared in regard to vegetation type, condition and representation in a regional context;
- list of flora species present and their conservation status;
- identification of any Threatened or Priority flora within the proposed clearing area;
- description of broad fauna habitat;
- a list of conservation significant terrestrial fauna species; and
- discussion of the proposed vegetation clearing in relation to the Ten Clearing Principles

1.2 Nomenclature

Key nomenclature used in this document:

- Clearing Permit Area: Development footprint (860.9 ha)
- Proposed Clearing Footprint: Area to be cleared (up to 638.4 ha)

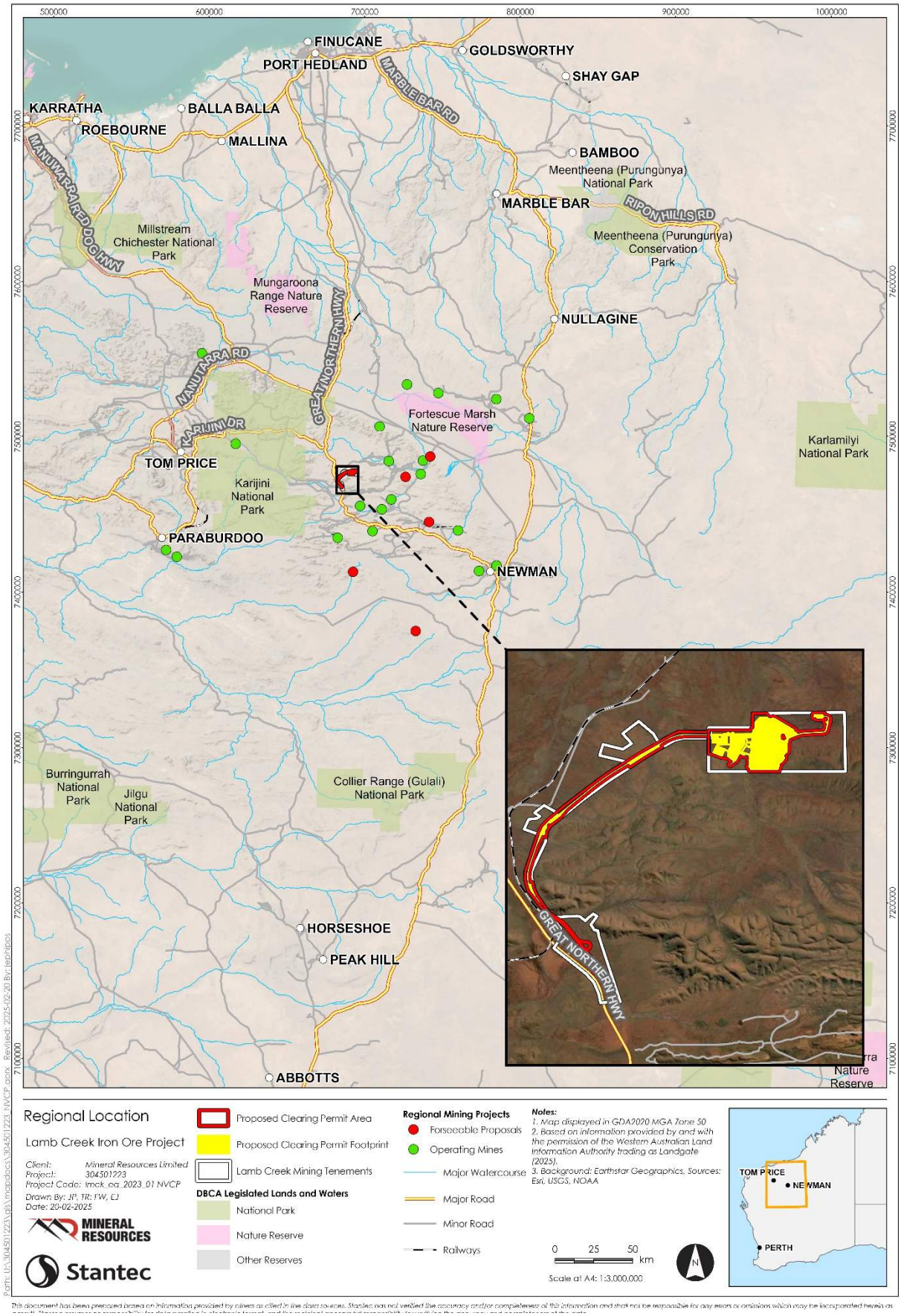

Figure 1: Project Location

1.3 Existing Approvals

The LCIOP was referred to the Environmental Protection Authority (EPA) under Part IV of the EP Act (Section 38 referral, APP-0026940) in December 2024. Following EPA's review of the referral, the scale and nature of potential environmental impacts of the LCIOP were found not to require assessment under Part IV, and a "Not Assessed" decision was reached by the EPA on 11 April 2025 (Ref. APP-0026940). As a result, approval for native vegetation clearing is being sought under Part V of the EP Act which is addressed in this document. Approval of prescribed activities will also be sought under Part V of the EP Act (Table 1).

Table 1: Pending Approvals for the Proposal

Process	Approval Authority	Relevant Legislation
Mining Proposal	DMIRS	*Mining Act 1978*
Mine Closure Plan	DMIRS	*Mining Act 1978*
Native Vegetation Clearing Permit	DWER	Part V Division 2 of the EP Act 1986
Bed and Banks Permit	DWER	*Rights in Water and Irrigation Act 1914*
Groundwater Licence	DWER	*Rights in Water and Irrigation Act 1914*
Works Approval	DWER	Part V of the EP Act 1986
EPBC	DCCEEW	*Environment Protection and Biodiversity Act 1999*

2. BACKGROUND

2.1 Location, Tenure and Site Layout

The proposed Clearing Permit Area lies within two tenements listed in **Table 2** and shown in **Figure 2.** These two tenements are held by Process Minerals International Pty Ltd, a wholly owned subsidiary of MinRes, and the mining tenure (M47/1592) overlies the Juna Downs pastoral lease held by Rio Tinto.

In addition, L47/1008 encroaches on one or more of the following tenements and land parcels:

- E 47/1329-I – Hamersley Iron Pty Ltd
- E 47/1790-I - Hamersley Iron Pty. Ltd
- ML 281SA - Itochu Minerals & Energy of Australia Pty Ltd, Mitsui Iron Ore Corporation Pty Ltd, BHP Minerals Pty Ltd
- Road - Main Roads Western Australia (Road)
- GE L021124 - (Hamersley Iron Pty Ltd – Yandicoogina Rail)
- PL N050471 – Juna Downs Pastoral Lease

Table 2: Project Tenements

Tenement	Area (Ha)	Holder	Granted	Expiry
M47/1592	1,200.4	Process Minerals International Pty Ltd	Pending	Pending
L47/1008	998.9	Process Minerals International Pty Ltd	16/07/2021	27/03/2044

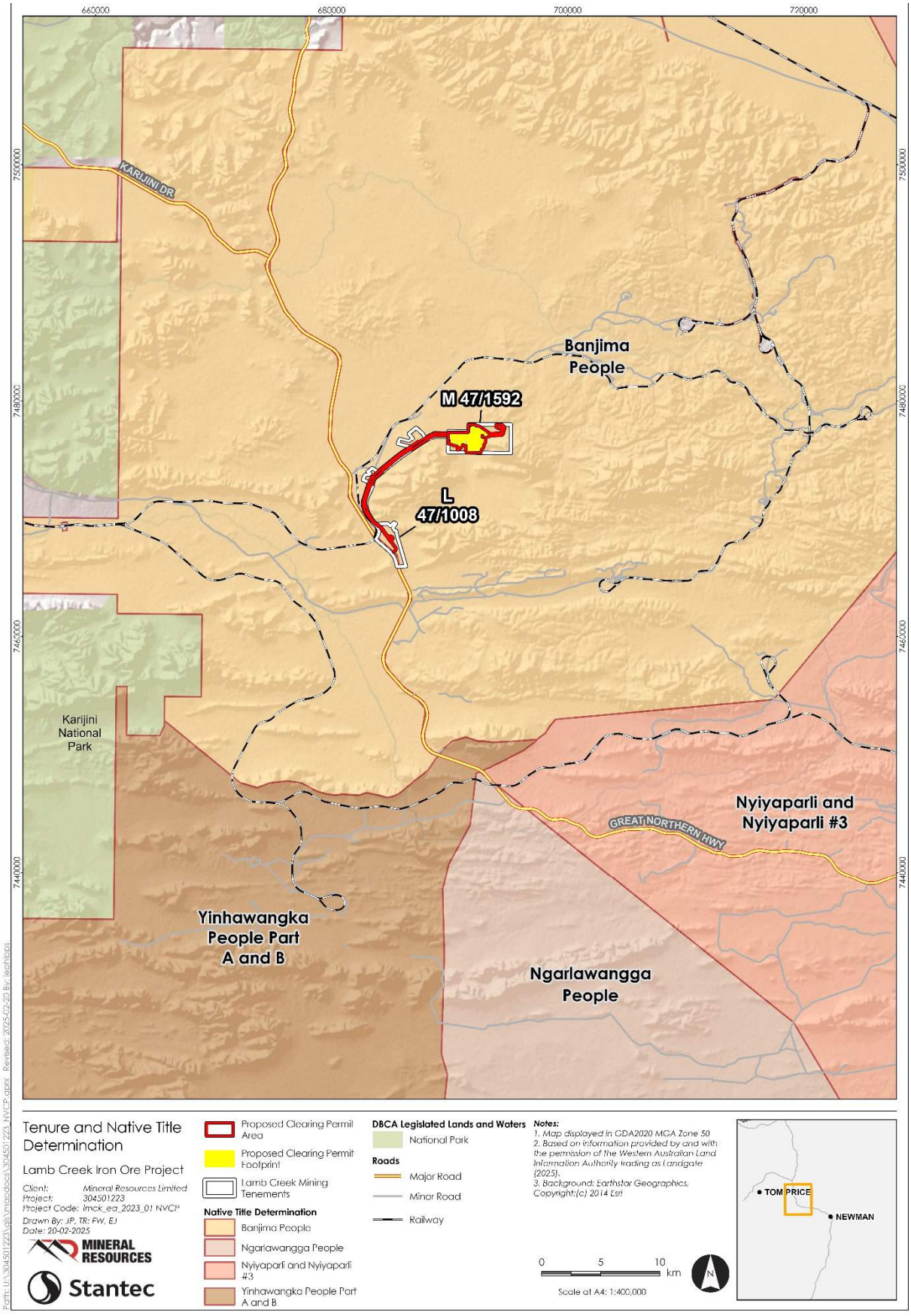

Figure 2: Lamb Creek Mining Tenements and Native Title Determination

2.2 Contact Details

The primary person responsible for the Proposal is as follows:

Proponent: Process Minerals International (PMI) a wholly owned subsidiary of Mineral Resources Limited (MinRes) (ACN 118 549 910)
Address: 20 Walters Drive, Osbourne Park, WA, 6017
Postal Address: Locked Bag 13, Osbourne Park DC, WA, 6916
Corporate contact: Celine Mangan – General Manager Environment and Heritage
Phone: +61 8 9315 8774
Email: celine.mangan@mrl.com.au

3. PROPOSED ACTIVITIES

The proposed Project involves the development of an open cut mine to allow the extraction of iron ore from the Lamb Creek deposit. This will comprise a multi-stage crushing and screening process plant and associated mine infrastructure including, but not limited to, site offices, maintenance and equipment service area, water pipelines, fuel storage, power generation, telecommunications, and an accommodation village for site personnel.

3.1 Description of Proposed Activities

The Project will consist of the development of an open cut iron ore mine and two waste rock landforms (WRLs) and supporting mining infrastructure, as detailed below.

The main mining activities that will require vegetation clearing are listed below:

- Mining and processing elements:
- open pit;
- internal haul roads;
- run of mine (RoM) pad;
- two waste rock landforms (WRLs);
- processing facilities;
- explosives storage;
- water storage dam;
- laydown/hardstands;
- ore stockpiles; and
- topsoil stockpiles;
- Infrastructure elements:
- accommodation camps;
- light/heavy vehicle roads;
- workshops;
- power supply infrastructure;
- fuel/hydrocarbon storage;
- potable water storage;
- waste disposal; and
- sewage treatment and disposal.

3.2 Estimated Vegetation Disturbance Requirements

MinRes proposes the removal of up to 638.4 ha of native vegetation within the Proposed Clearing Footprint to allow the works listed in Section 3.1. The Proposed Clearing Footprint (638.4 ha) and proposed Clearing Permit Area (860.9 ha) are shown in **Figure 3**.

MinRes will ensure that clearing is minimised as much as practicable and is maintained within the boundaries of the Clearing Permit Area, which has been designed to avoid and minimise impacts to the eight taxa listed under the *Biodiversity Conservation Act 2016* (BC Act) within and surrounding the Clearing Permit Area.

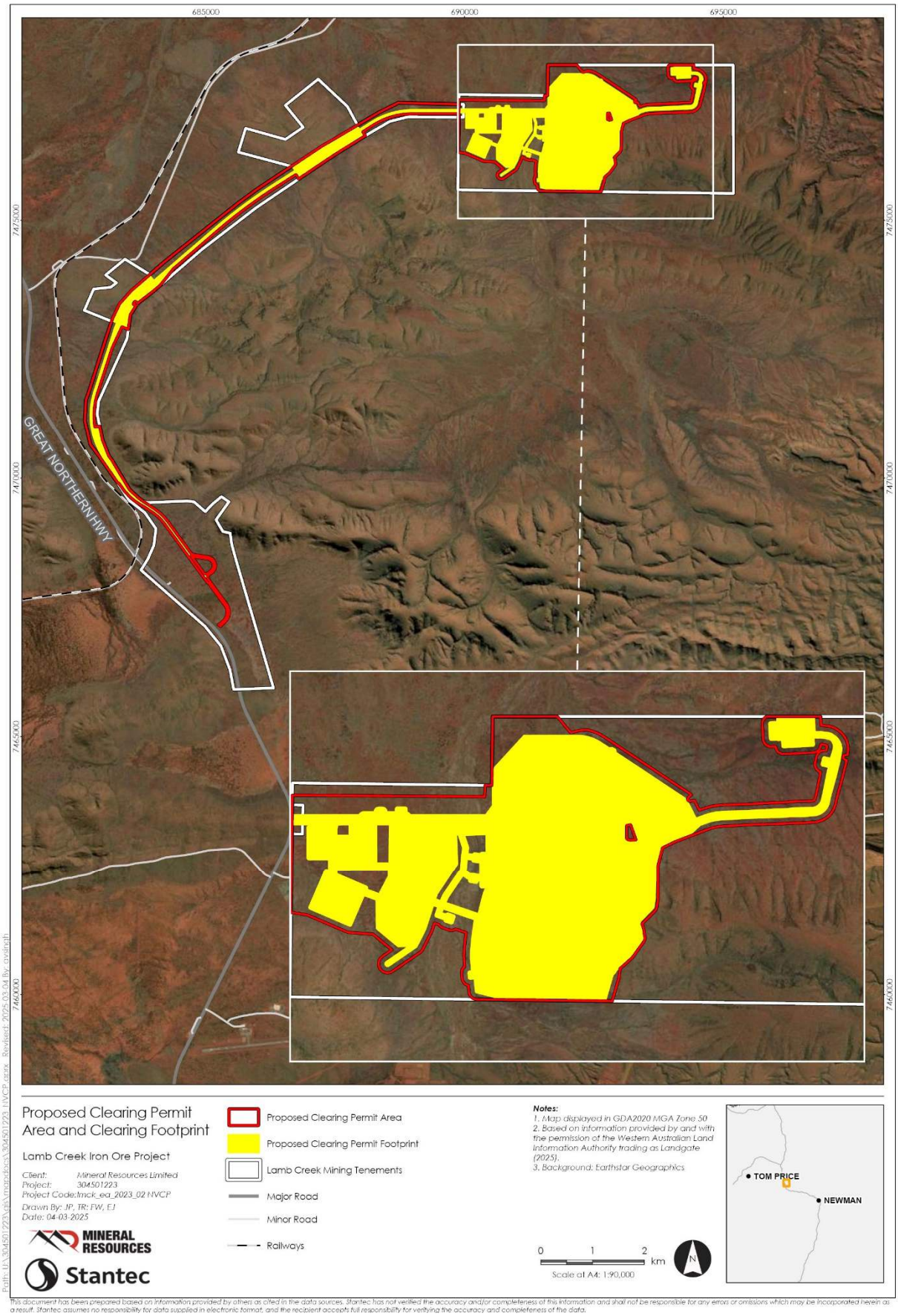

Figure 3: Proposed Clearing Permit Area and Clearing Footprint of this NVCP Application

3.3 Method of Vegetation Disturbance

MinRes will ensure all clearing and ground disturbance is carried out in accordance with the Land Activity Permit Procedure (MRL-EN-PRO-0005) and Land Clearing Procedure (MRL-EN-PRO-0004). Noting this, the following methods of vegetation clearing will be implemented during the construction phase of the Project:

- prior to clearing, a Project specific internal Land Activity Permit (LAP) (MRL-PD-PRO-0001) will be completed and signed off by multi-disciplinary MinRes departments;
- clearing areas will be delineated in accordance with the Project specific internal LAP, the clearing will be surveyed and demarcated with survey pegs and flagging tape;
- vegetation will be removed prior to topsoil striping. Vegetation will generally be cleared 'blade up' with bulldozers or graders within the Clearing Permit Area. Diggers and loaders may be used around drainage lines as required;
- the upper 0.2 m (topsoil) of the soil profile within the proposed disturbance area is stripped (where possible) and placed in stockpiles (paddock dumped not greater than 2m in height with adequate distance between them to create a series of mounds and troughs);
- subsoil may also be stripped and stockpiled separately to ensure adequate capping and growth media is collected;
- any rock fragments and surface litter present within the soil profiles will be collected and stockpiled with the topsoil;
- machinery operators will aim to minimise the frequency and intensity of disturbance, so they do not compromise the structural integrity of the material. Handling of topsoil will be minimised as much as possible, particularly when wet;
- soil stripping is planned to occur as close as possible to the time the proposed disturbance is scheduled to commence.

3.4 Rehabilitation and Maintenance

MinRes will implement a Mine Closure Plan (MCP) (submitted with Mining Proposal Reg ID 500175) 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 will be undertaken over the life of the mine, with progressive backfilling of the pit occurring during all three stages of pit development, to at least 5 m above the pre-mining water table. An appropriate rehabilitation plan incorporating surface treatments and seed selection, collection, storage, and management will be implemented.

Areas disturbed through implementation of the Project 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 arrival on site to minimise the risk of spreading or introducing weeds within the proposed Clearing Permit Area.

The following topsoil management measures will be undertaken:

- Available topsoil stripped from all clearing areas and stockpiled for use during rehabilitation;
- Material movement and storage incorporated in mine planning;
- Respreading of stockpiled topsoil and vegetation over rehabilitation areas as soon as they become available;
- Pre-stripping of topsoil not to be undertaken in wet conditions;
- Topsoil stripping depth will be pre-determined;
- Topsoil stockpiled to a height of no more than 2 m in height or other evidence based restrictions;
- Topsoil stockpiles located away from drainage channels and trafficable areas, and appropriately signed and recorded for future reference.

- Consider other growth media, and seed pellets where necessary.

3.5 Indicative Timeline

Subject to approval, construction of the Project is anticipated to commence in quarter three of 2025. The Project is not a staged development, and an indicative implementation schedule is shown in Table 3.

Table 3: Indicative development schedule for the Project

Stage	Indicative Timing
Commence construction	Q3 2025 to Q1 2026
Commence commissioning	Q4 2025 to Q1 2026
Commence operation	Q4 2025
Commence mining, haulage and export	Q4 2025 to Q1 2026
End operations	FY 2029
Commence decommissioning and closure	FY 2030

4. RECEIVING ENVIRONMENT

4.1 Biogeographical Location

The Interim Biogeographic Regionalisation for Australia (IBRA) is a bioregional framework that divides Australia into 89 biogeographic regions and 419 subregions on the basis of climate, geology, landforms, vegetation, and fauna (Thackway and Cresswell 1995). The proposed Clearing Permit Area lies within the Pilbara bioregion and the Hamersley (PIL3) subregion. The Hamersley subregion is described as a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges of basalt, shale and dolerite (Kendrick 2001). Vegetation of the subregion is typically Mulga (*Acacia aneura*) low woodland over bunched grasses on fine textured soil in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soil of the ranges (Kendrick 2001).

4.2 Climate

The climate of the region is typically arid, with hot summers and cool winters. Rainfall can be highly variable, but generally higher in late summer as a result of tropical lows and cyclonic activity moving inland from the north-west coast. The closest Bureau of Meteorology (BOM) weather station to the Project area is Newman Airport (station number 007176), located approximately 130 km south-east. Rainfall data has been recorded since 1971 and temperature data since 1996. At Newman Airport, annual mean rainfall was 325 mm and annual mean maximum temperatures ranged from 23°C in June to 39°C in December (**Figure 4**) (BoM 2022).

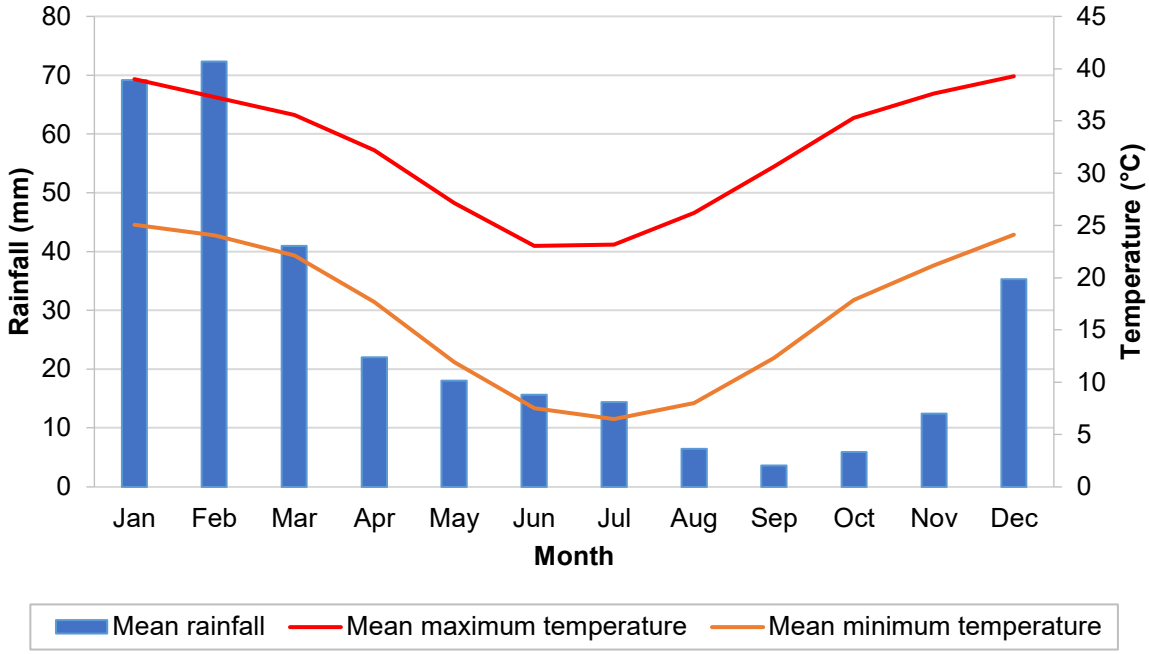

Figure 4: Mean monthly rainfall (1971-2021) and temperature data (1996-2021) recorded at Newman airport (station number 007176)

4.3 Land Use

The Clearing Permit Area is largely within the Juna Downs pastoral lease (LPL N050471). The dominant land uses in the Pilbara bioregion are pastoralism, conservation, mining, agriculture, tourism and urban.

4.4 Land Systems

The proposed Clearing Permit Area intersects five different land systems within the Hamersley subregion: Boolgeeda, McKay, Newman, Platform and Wannamunna. A description of each land system the approximate area of each land system within the proposed Clearing Permit Area are presented in **Table 4**.

Table 4: Land Systems of the Proposed Clearing Permit Area

Land System	Description (Van Vreeswyk *et al.* 2004)	Area within Proposed Clearing Permit Area (ha)(%)	Area within the Clearing Footprint (ha)(%)
Boolgeeda	Stony lower slopes and stony plains and narrow drainage floors and channels, supporting hard and soft spinifex grasslands and mulga shrublands, level stony plains and narrow sub-parallel drainage floors, relief up to 20 m. Often occurs below hill systems such as Newman and Rocklea.	762 (88.5)	562.1 (88.0)
McKay	Hills, ridges, plateaux remnants and minor breakaways of sedimentary and meta sedimentary rocks supporting hard spinifex grasslands; relief up to 100 m.	20.1 (2.3)	12.7 (2.0)

Land System	Description (Van Vreeswyk *et al.* 2004)	Area within Proposed Clearing Permit Area (ha)(%)	Area within the Clearing Footprint (ha)(%)
Newman	Rugged high mountains, ridges and plateaux with near vertical escarpments of jaspilite, chert and shale, supporting hard spinifex grasslands; relief up to 400 m.	53.5 (6.2)	51.2 (8.0)
Platform	Stony upper plains, dissected slopes and drainage floors, supporting hard spinifex grasslands. Erosional surfaces formed by partial dissection of the old tertiary surface. The gently inclined upper plains have extensive marginal dissection zones with gently inclined to steep slopes. Floors incised up to 30m with steep stable marginal slopes becoming wider downslope.	21.4 (2.5)	9.5 (1.5)
Wannamunna	Hardpan plains and internal drainage tracts supporting mulga shrubland and woodlands, and occasionally eucalypt woodlands). Depositional surfaces, level hardpan wash plains subject to overland sheet flow. Broad internal drainage flats receiving run-on from adjacent hardpan surfaces; rare, channelled tracts but moistly no organised through drainage; relief up to 5m.	4 (0.5)	3 (0.5)

4.5 Landform Soil and Geology

4.5.1 Landform

The landform types within the proposed Clearing Permit Area are considered to be extensively represented within the subregion. Gazetted landforms in the region include Iron Ore Ridge, which runs east-west around 12 km south of the Project Area (location of BHP's 'Mining Area C' iron ore mine as shown in **Figure 1**) (MBS Environmental 2021).

4.5.2 Topography

The topography of the subregion is rugged, comprising three small mountain ranges; Packsaddle Range in the centre, Jirrpalpur Range in the south and the Hancock Range to the north (Rapallo 2021b). The proposed Clearing Permit Area is situated within the Hancock Range, which is characterised by low rugged hills. The area ranges in elevation from approximately 700 m RL to 800 m RL on a ridgeline on the east side, although majority of the site is between 700 m RL and 720 m RL, with typical surface slopes of about 1%. The eastern ridge has a maximum height of approximately 1,064 m RL.

4.5.3 Soil

A baseline soil and landform assessment was undertaken in 2021, and the physical and chemical properties of soil in the proposed Clearing Permit Area are summarised below (MBS Environmental 2021):

- Stony soils were dominant, particularly in areas of higher elevation; gravel contents reflected this and were mostly >50% throughout the soil profile. Small pockets of red sandy loam were present in lower-lying areas, particularly in proximity to drainage channels.
- Depth to refusal (hardpan) varied between 700 and 2,000 mm.

- Topsoil and subsoil consisted of sandy loam and loamy sands. The soil contained between 12 and 18% clay and were generally non-dispersive, slightly to moderately acidic (5.6 - 6.6) and non-saline, having EC values of less than 10 mS/m. Consistent with their sandy texture, soils generally had a low cation exchange capacity (ECEC) and exhibited organic carbon and carbon to nitrogen (C: N) ratios typical of soils from northern Western Australian.
- Most nutrients and trace elements were present in adequate concentrations within topsoils with the exception of boron; cobalt; molybdenum and nickel, which may be deficient. Phytoavailable manganese concentrations were classified as elevated in some soils; the concentrations were unlikely to impact plant growth.
- Concentrations of potentially environmentally significant metals and metalloids were below relevant ecological investigation levels and consistent with levels typical of Australian soils, with the exception of selenium. It was found that while pseudo-total selenium concentrations were elevated, phytoavailable concentrations were low, indicating the presence of low levels of soluble forms of selenium and correspondingly a minimal environmental risk or phytotoxicity/ecotoxicity potential.

4.5.4 Geology

The proposed Clearing Permit Area occurs within the Hamersley Ranges which dominate the subregion (Thorne and Tyler 1997). Basement rocks in the region comprise early Proterozoic Brockman Iron Formation and Weeli Wolli Formation within the Hamersley Basin, a late Archaean to early Proterozoic (2,765-2,470 million years) depositional basin which is exposed over most of the southern part of the Pilbara Craton (MBS Environmental 2021). The Brockman Iron Formation, consisting of banded iron formation (BIF) and shale, is the main iron formation within the Hamersley Group (Trendall and Blockley 1970). The geological units found within the Project Area are outlined in **Table 5**.

Table 5: Clearing Area Geological Descriptions (Thorne and Tyler 1997)

Geological Unit	Description
Brockman Iron Formation	BIF, chert and pelite.
Quaternary Alluvium	Unconsolidated silt, sand and gravel; in drainage channels and adjacent floodplains
Quaternary Alluvium and Colluvium	Red-brown sandy clayey soil; on low slopes and sheetwash areas.
Cainozoic Colluvium	Partly consolidated quartz and rock fragments in silt and sand matrix; old valley-fill deposits.

4.6 Surface Hydrology and Hydrogeology

Within the Hamersley subregion, drainage runs into either the Fortescue River to the north, the Ashburton River to the south, or the Robe River to the west (Kendrick and McKenzie 2001) (**Figure 5**). There are no permanent or semi-permanent surface water features in the proposed Clearing Permit Area.

The Lamb Creek orebody is located approximately 600 m east of Mine Creek, which drains northward to a confluence with Marillana Creek about 9 km north of the proposed Clearing Permit Area. Marillana Creek flows into Weeli Wolli Creek which supports the Weeli Wolli Spring, listed as a Priority 2 (P2) priority ecological community (PEC), associated with riparian woodland and forest associations of unusual composition, relatively high diversity of stygofauna, and a diverse microbat assemblage (Department of Biodiversity Conservation and Attractions 2022; Kendrick and McKenzie 2001). Weeli Wolli Creek eventually transitions to a channel with an alluvial fan floodplain before discharging to the Fortescue Marshes (approximately 100 km downstream).

The Weeli Wolli Spring is the nearest site (approximately 31 km) considered to be of high ecological and cultural value, as it represents a rare source of permanent water within the region and is located upstream of the confluence of Weeli Wolli Creek and Marillana Creek.

Within the subregion, diffuse recharge to the 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 2021). The main iron-bearing formation within the Hamersley Group, the Brockman Iron Formation, comprises generally low permeability BIF and shales. However, where mineralised, the BIF has enhanced permeability and storage and can be considered an aquifer.

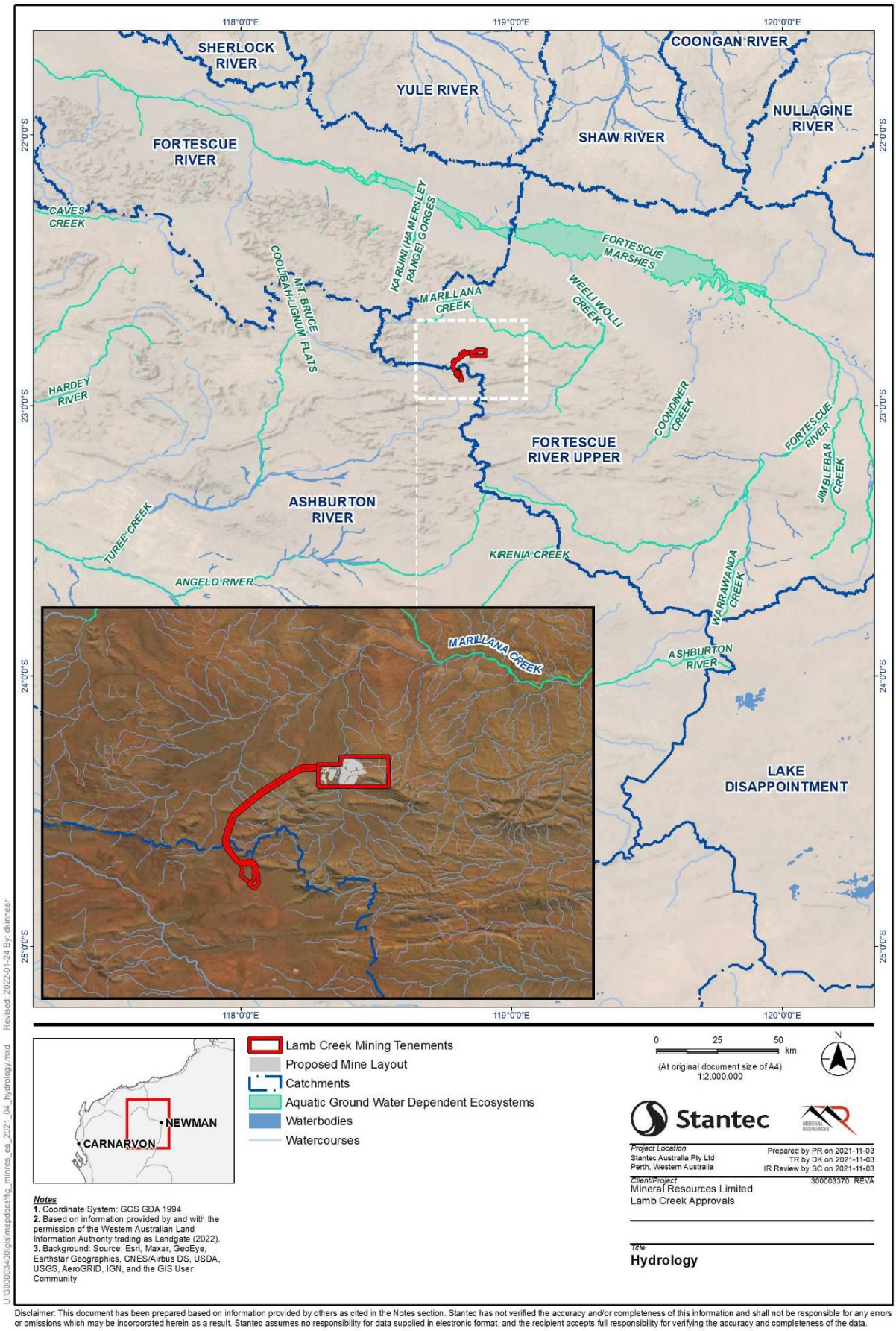

Figure 5: Surface Hydrology in the Vicinity of the Clearing Area

4.7 Flora and Vegetation

4.7.1 Flora and Vegetation Surveys

A search of the NatureMap database within a 40 km buffer of the proposed Clearing Permit Area is shown in **Appendix D**. In addition to the database search, the proposed Clearing Permit Area has been subject to several in-field surveys since 2012. In addition to surveys completed within the Flora and Vegetation Survey Area, regional surveys undertaken in the vicinity of the proposed Clearing Permit Area, were used to provide contextual information and to inform the baseline desktop assessment. There have been three detailed field surveys, one two-phase targeted survey and one desktop vegetation mapping exercise undertaken within, and for, the Flora and Vegetation Survey Area (**Figure 6** and **Appendix B, Appendix C**).

4.7.2 Vegetation

4.7.2.1 Pre-European Vegetation

Pre-European vegetation mapping was originally undertaken by Beard (1975) at various scales across WA and has since been updated to be consistent with the National Vegetation Information System (NVIS) descriptions at a scale of 1:250,000 (Department of Primary Industry and Regional Development 2019). Two vegetation associations have been mapped within the Flora and Vegetation Survey Area; Hamersley 18 and Hamersley 82 (**Table 6**) described as follows:

- Hamersley 18: Low woodland; continuous Mulga woodland communities over spinifex *Triodia basedowii* and *Triodia epactia* hummock grasslands on stony undulating plains; and
- Hamersley 82: Low scattered tree steppe; Snappy Gum *Eucalyptus leucophloia* over spinifex *Triodia wiseana* hummock grassland on stony undulating plains.

Vegetation association retaining less than 30% of their pre-European extent generally experience accelerated species loss at an ecosystem level and are regarded as being ‘vulnerable’, while vegetation types retaining less than 10% of their original extent are regarded as being ‘endangered’ (Authority 2000). The two vegetation associations found to intersect the Clearing Permit Area have close to 100% of their original extent remaining and are considered ‘least concern’. In addition, at a scale of 1:1,000,000, the vegetation units described by Beard (1975) within the Clearing Permit Area are well represented throughout the Pilbara bioregion.

Table 6: Vegetation System Associations within the Proposed Clearing Permit Area

Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent Remaining (ha)	Pre-European Extent Remaining	Conservation Status	Extent In Clearing Permit Area (ha)	Extent in Clearing Footprint (ha)
Hamersley 18.11	State Wide	19,892,306	19,843,148	99.75%	Least Concern	588 (68.4%)	410 (64.3%)
	Pilbara Bioregion	676,556	671,843	99.30%	Least Concern		
Hamersley 82.3	State Wide	2,565,901	2,157,841	99.51%	Least Concern	272 (31.6%)	228 (35.7%)
	Pilbara Bioregion	2,563,583	2,550,888	99.50%	Least Concern		

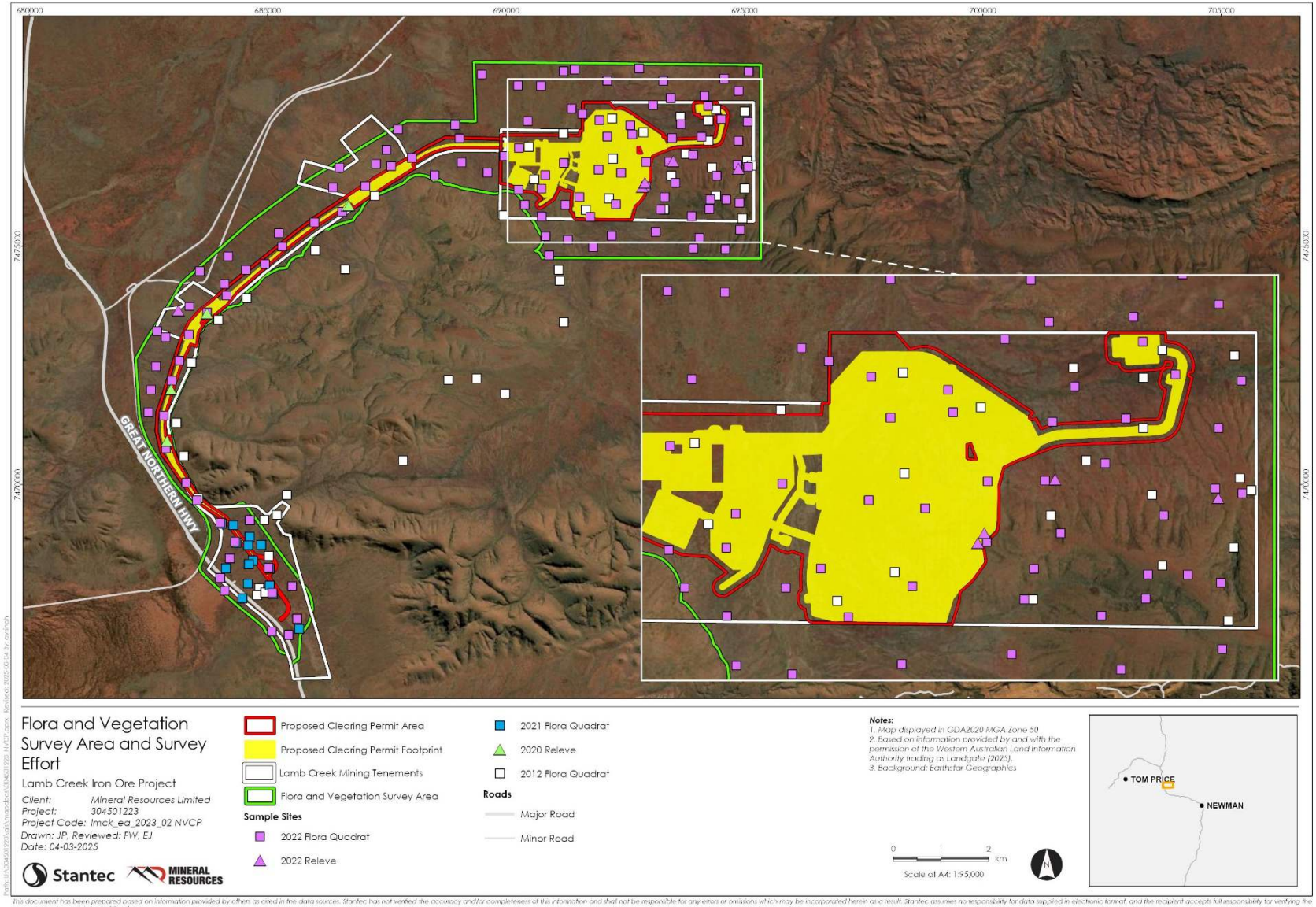

Figure 6: Flora and Vegetation Survey Area and Survey Effort

4.7.2.2 Vegetation Types

The most recent detailed flora and vegetation survey undertaken by Umwelt (2022a) found a total of 10 vegetation types within the study area with nine of these being within the Clearing Permit Area (**Table 7**, **Figure 7**, **Appendix B**). The vegetation types mapped belonged to three broad groups based on soil and topography. Group 1 is characterised by Woodlands over sparse shrublands and hummock grasslands on gentle lower to upperslopes on redbrown clay loams. Group 2 is charactered by Open Woodlands over sparse shrublands and tussock and hummock grasslands on steep slopes, crests, gullies and gorges with exposed ironstone and skeletal soils. Group 3 is characterised by Mulga Woodlands over tussock grasslands and open woodlands over sparse shrublands over hummock grasslands on red-brown clay-loam on plains; and open woodlands over shrublands over hummock grasslands on major and minor drainage lines. None of these communities were considered representative of any listed Priority Ecological Community (PEC) or Threatened Ecological Community (TEC), nor are they considered regionally significant vegetation for any other reason and are likely to be represented elsewhere.

4.7.2.3 Vegetation Condition

The condition of the vegetation in the Study Area was rated Good to Excellent (Umwelt 2022a). The majority of the vegetation (90.5 %) rated as Excellent, with no obvious signs of damage caused by human activities. The remainder of the vegetation was rated as Very Good and Good (8.2 % and 1.2 % respectively), with some historical mechanical disturbance but mostly low levels of introduced flora within the Study Area. Less than 1 % of the Study Area (5 ha) was mapped as cleared with no native vegetation remaining.

The vegetation of the Study Area has for the most part been subject to fire in the past 10 years however none of the Study Area has been burnt more recently than four and a half years prior to survey (Umwelt 2022). This has resulted in a mosaic of vegetation of different fire ages. Floristic data and site photos collected in 2020 and 2021 indicate that these fires have changed both vegetation structure and floristic composition since 2012 (Rapallo 2021b).

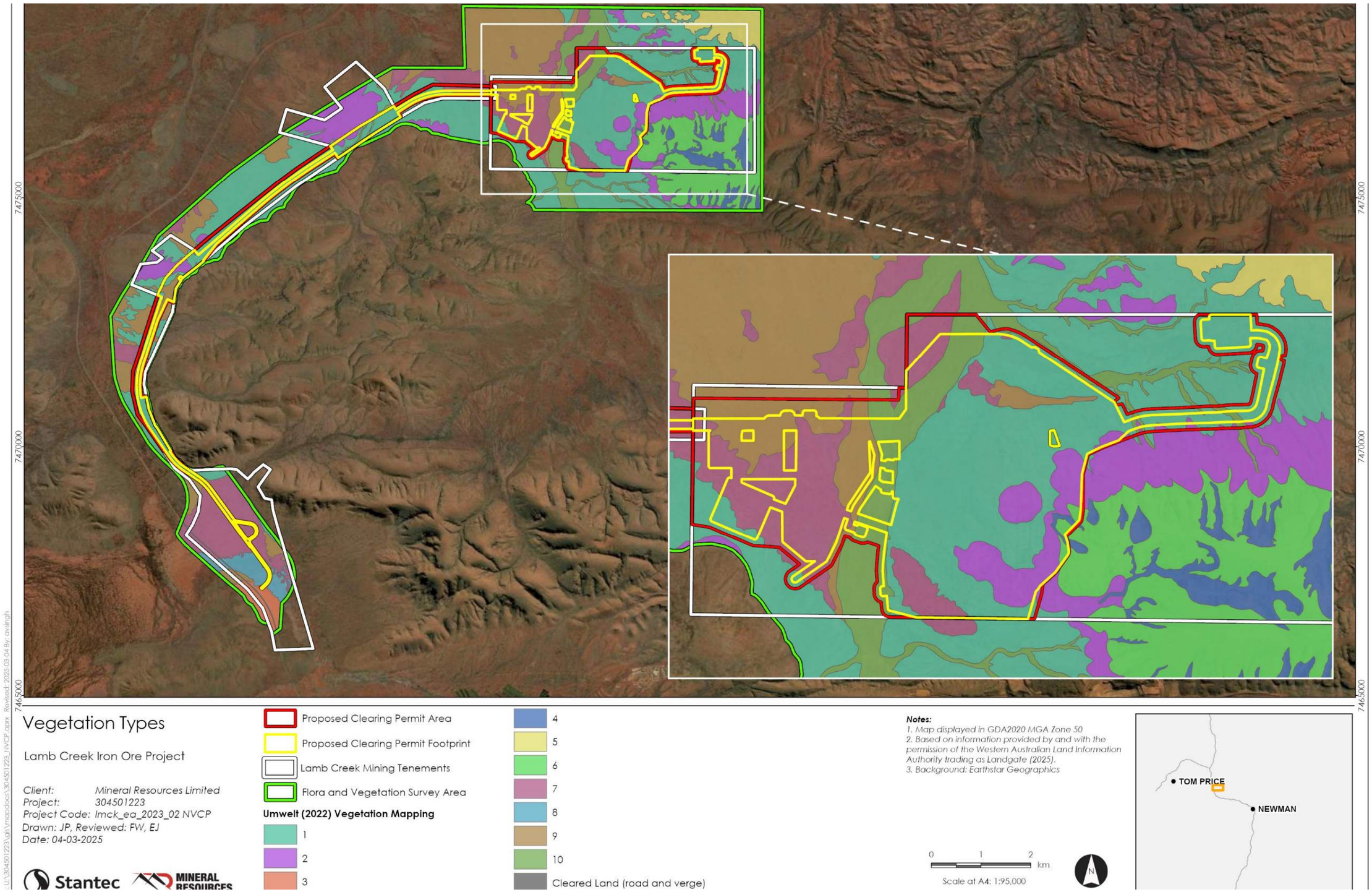

Figure 7: Vegetation Types mapped within the Flora and Vegetation Survey Area

Table 7: Vegetation Types Mapped Within the Proposed Clearing Permit Area

Vegetation Type	Description	Extent in Survey Area (ha)	Extent in Clearing Permit Area (ha)	Extent in the Clearing Footprint (ha)
Group 1: Woodlands over sparse shrublands and hummock grasslands on gentle lower to upperslopes on redbrown clay loams				
1	Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia* and/or *E. gamophylla* with isolated *Corymbia deserticola* subsp. *deserticola* over low to mid sparse to open shrubland dominated by species including *Acacia atkinsiana* and *A. ancistrocarpa* over low open hummock grassland of *Triodia pungens*, *T. vanleeuwenii* and *T. wiseana* and low open tussock grassland of *Themeda* sp. Mt Barricade and *Paraneurachne muelleri* on red-brown sandy clay loam to clay loam on gently inclined mid to lower slopes and associated drainage lines	1429.2 (37.75%)	445.79 (51.8%)	342.68 (53.7%)
2	Low open woodland of *Eucalyptus leucophloia* subsp. *leucophloia* with occasional *Corymbia deserticola* subsp. *deserticola* and *C. hamersleyana* over low sparse shrubland of *Acacia hilliana* and *Hakea chordophylla* over open hummock grassland of *Triodia vanleeuwenii* and *T. wi*seana on red-brown clay loam with ironstone pebbles on gently inclined lower to upper slopes	382.3 (10.1%)	66.36 (7.7 %)	62.37 (9.8%)
3	Isolated trees of *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *E. gamophylla* over low sparse shrubland of mixed Acacia species over low hummock grassland of *Triodia pungens* and *T. wiseana* on red-brown sandy clay loam on mid to lowerslopes with ironstone pebbles	48.2 (1.27 %)	0.21 (0.02%)	0.16 (0.03%)
Group 2: Open Woodlands over sparse shrublands and tussock and hummock grasslands on steep slopes, crests, gullies and gorges with exposed ironstone and skeletal soils.				
4	Low open woodland of *Corymbia ferriticola* or *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* with *Ficus brachypoda* occurring on gorge and gully areas, over low sparse shrubland of mixed species dominated by *Corchorus laniflorus*, *Dodonaea viscosa* subsp. *mucronata* and *Gossypium robinsonii* over sparse hummock grassland dominated by *Triodia pungens* with *T. wiseana* and tussock grasses including *Cymbopogon ambiguus* and *Aristida burbidgeae* on red brown clay loam on steep upperslopes, gullies, breakaways and gorges with significant ironstone outcropping.	95.3 (2.52 %)	1.57 (0.2%)	1.46 (0.2%)
5	Occasional *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia hamersleyana* over mixed isolated shrubs including *Acacia inaequilatera* and *Senna artemisioides* subsp. *glutinosa* over low hummock grassland of *Triodia wiseana* on steep upperslopes and associated drainage lines on red-brown clay loam with exposed ironstone and dolerite	100.9 (2.44 %)	0	0
6	Low woodland to open woodland of *Corymbia hamersleyana* and *Eucalyptus leucophloia* subsp. *leucophloia* and occasional *E. kingsmillii* over mid isolated shrubs of *Acacia hamersleyensis* and *Grevillea wickhamii* ?subsp. *hispidula* over low hummock grassland of *Triodia wiseana* on red brown sandy clay loam on steep mid to upperslopes with exposed ironstone	316.6 (8.36 %)	3.98 (0.5%)	3.41 (0.5%)
Group 3: Mulga Woodlands over tussock grasslands and open woodlands over sparse shrublands over hummock grasslands on red-brown clay-loam on plains; and open woodlands over shrublands over hummock grasslands on major and minor drainage lines				
7	Isolated trees of *Corymbia hamersleyana*, *Eucalyptus leucophloia* subsp. *leucophloia* and *Eucalyptus xerothermica* over low open to sparse shrubland dominated by *Acacia aptaneura*, *A. aneura* and *A. pruinocarpa* over low tussock grassland to sparse tussock grassland dominated by *Themeda* sp. Mt Barricade (M.E. Trudgen 2471), *Enneapogon polyphyllus*, *Chrysopogon fallax* and *Aristida* spp. with occasional *Triodia pungens* on red brown clay loam with some ironstone pebbles on plains	523.4 (13.83%)	170.22 (19.8 %)	117.63 (18.4%)
8	Isolated trees of *Eucalyptus xerothermica* over tall open to sparse shrubland of *Hakea lorea* subsp. *Lorea* and *Acacia aptaneura* over low open tussock grassland of *Aristida contorta*, *A. inaequiglumis* and *Themeda triandra* on red-brown sandy clay to clay on plains	68.9 (1.82 %)	2.96 (0.3%)	2.22 (0.4%)
9	Low open woodland of *Corymbia hamersleyana*, *C. deserticola* subsp. *deserticola*, *Eucalyptus gamophylla* and *Eucalyptus leucophloia* subsp. *leucophloia* over tall sparse shrubland of *Acacia atkinsoniana* and occasional *A. ancistrocarpa* and *A. aptaneura* over low hummock grassland dominated by *Triodia pungens* and occasional *T. wiseana* with *Paraneurachne muelleri* also dominant on red-brown clay loam with ironstone pebbles on plains	600.8 (15.87 %)	102.64 (11.9%)	67.81 (10.6%)
10	Low open woodland of *Corymbia hamersleyana* with occasional *Eucalyptus gamophylla*, *E. leucophloia* subsp. *leucophloia* and *E. xerothermica* over tall open shrubland dominated by taxa including *Acacia cowleana*, *A. tumida* var. *pilbarensis*, *Gossypium robinsonii* and *A. pyrifolia* over low open hummock grassland of *Triodia pungens* and tussock grassland dominated by *Themeda* sp. Mt Barricade (M.E. Trudgen 2471) and *Aristida* spp. on red-brown clay loams on major and minor drainage lines	215.5 (4.6 %)	67.13 (7.8 %)	40.67 (6.4%)
Cleared, rehabilitated, existing roads and tracks (not a vegetation type.)				
	Cleared	4.6 (0.12%)	0	0
Total		**3785.7**	**860.9**	**638.4**

4.7.3 Flora

4.7.3.1 Floristic composition

The Umwelt (2022a) survey recorded 328 vascular flora taxa from 45 families and 137 genera, including 7 introduced taxa (**Appendix B**). The most well-represented families were Fabaceae (64 discrete taxa, three known hybrids), Poaceae (56 taxa), Malvaceae (45 taxa) and Amaranthaceae (16 taxa).

4.7.3.2 Conservation Significant Flora

Nine significant flora species were recorded within, and adjacent to, the Clearing Permit Area (Umwelt 2022b). This includes six DBCA-listed Priority flora taxa, one Commonwealth listed taxa and two taxa considered significant under the 'new species or species with anomalous features that indicate a potential new species' which are referred to as "potentially undescribed (Umwelt 2022a):

- *Aristida jerichoensis* var. *subspinulifera* (P3)
- *Aristida lazaridis* (P2)
- *Corchorus sp*. (Potentially undescribed)
- *Eremophila naaykensii* (P3)
- *Euphorbia ferdinandi* s. lat. (Potentially undescribed)
- *Hibiscus* sp. Gurinbiddy Range (M.E. Trudgen MET 15708) (P2)
- *Rhagodia* sp. Hamersley (M. Trudgen 17794) (P3)
- *Rostellularia adscendens* var. *latiflora* (P3)
- *Seringia exastia* (T – Commonwealth)

Three significant taxa were recorded in the Indicative Footprint. These were:

- *Rhagodia* sp. Hamersley (M. Trudgen 17794) was not recorded Umwelt (2022a) but 3 plants were previously recorded by Rapallo (2022c).
- *Aristida lazaridis* (P2) - Umwelt (2022a) recorded three records with a total of four individuals while Rapallo 2022c recorded 58 plants from 44 records; and
- *Seringia exastia* (T) - Umwelt (2022a) recorded 13 records with a total of 221 individuals while Rapallo 2022c recorded none).

A single plant of *Aristida jerichoensis* var. *subspinulifera* has been recorded in the Clearing Permit Area in the indirect impact assessment zone by Umwelt (2022a) but outside of the Indicative Footprint. The Umwelt (2022a) survey recorded locations of *Seringia exastia*, a taxon currently still listed as Threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) however it has been delisted under the BC Act. Locations of significant flora taxa recorded in the Study Area by the Umwelt 2022 survey are presented in **Table 8** and **Figure 8.** The Umwelt survey recorded *Goodenia nuda* during the survey however this species has now been delisted from a priority 4 to not threatened and therefore has been excluded from **Table 8.** All significant flora taxa recorded within the Flora and Vegetation Survey Area also occur within the broader Hamersley subregion.

Table 8: Significant Flora Recorded in the Rapallo (2022c) and Umwelt (2022a) Flora and Vegetation Survey Area

Species	Conservation Status	Habitat	Vegetation Types	No. of Individuals: Survey Area (both surveys)	No. of Individuals: Clearing Footprint (Umwelt 2022a)	Other previous records of species
Seringia exastia	T/Cr	Variety of Mulga woodlands, sometimes with *Eucalyptus* spp., over *Acacia* spp. shrublands over *Triodia pungens* hummock grassland. Gullies and washouts. Red sand/laterite over sandstone.	1~,˜ 2, 3, 6, 9, 10	783 in 37 locations	221 from 13 records	The species is currently listed as Critically Endangered under the EPBC Act, but this is due to a taxonomic revision where a threatened and a common species were merged, and the name of the former was adopted as the new name, with the conservation status still attached. The current distribution map published on FloraBase (Western Australian Herbarium 1998) incorporates this revision, showing *Seringia exastia* as widespread across northern Western Australia, ranging from the Coolgardie and Murchison IBRA regions in the south to the Dampierland IBRA region in the north. *Seringia exastia* is no longer listed as Threatened under State legislation and is expected to be de-listed under the EPBC Act in the future. The Rapallo (2022c) survey found 2 additional records in their targeted flora survey area of the Lamb Creek site.
Aristida lazaridis	P2	Plain, clay/loam, drainage, slope; often Mulga low open woodland with or without *Eucalyptus* spp., over variety of shrubs and herbs, often over tussock grassland but sometimes with *Triodia* spp. hummock grassland.	7~, 8~, 3, 9	7217 in 3094 locations	4 from 3 records (58 recorded by Rapallo (2022c)	Rapallo (2022c) recorded an estimated population of 12773 plants from 6757 point locations over the 2020 and 2021 surveys undertaken. Searches outside the survey area on foot and from helicopter recorded the species extending outside the project area. A significant population of *Aristida lazaridis* (2405 individuals) has been recorded in deep loam soil along an un-incised drainage line north and west of the BHP Packsaddle Village, approximately 7 km south-east of the Clearing Permit Area. The species has also been recorded from Lake Robinson on the eastern fringe of the Coondewanna Flats. The Western Australian Herbarium (WAH) has 20 specimen records within their database, with collections from locations across approximately 130 km extending from the Rangers Station at Karijini National Park to near Newman (DBCA 2021c). There are 43 records from the Rio Tinto Priority Flora database (Rio Tinto 2018) extending over 60 km. Additionally, this species occurs over a 2,500 km range across the Northern Territory and Queensland (Atlas of Living Australia 2021).
Aristida jerichoensis var. *subspinulifera*	P3	Plain or flat, clay/loam. Often Mulga woodlands or *Acacia* spp. shrublands over spinifex and/or tussock grassland.	8~	97 in 8 locations	0	Locally, there is a WAH record of *Aristida jerichoensis* var. *subspinulifera* from 800 m northwest of the Clearing Permit Area, from a level plain of orange light clay (DBCA 2021a). There are 39 specimen records within the WAH database, with collections from locations spread across 290 km extending between Nammuldi to Newman, with outliers in the Little Sandy Desert and Murchison, as well as collections from the Northern Territory and Queensland (DBCA 2021c; Atlas of Living Australia 2021).
Eremophila naaykensii previously *Eremophila* sp. Hamersley Range	P3	Rocky gullies and gorges. Steep rocky hill slopes and summits, high in the landscape.	4~	73 from 37 locations	0	This species has been recorded approximately 8 km south of the Clearing Permit Area (DBCA 2021a) and from Baby Hope Downs approximately 35 km southeast of Proposal from five locations in rocky gullies and gorges (Biota 2014). There are 15 specimen records within Western Australia, with WAH records from locations spread across 220 km from Paraburdoo to Newman (Western Australia Herbarium 1998) and 345 records, within the Rio Tinto database; recorded from Eastern Range, Channar, Turee Syncline, Karijini National Park, West Angelas, Angelo Central and Hope Downs 1 (Rio Tinto 2016).
Corchorus sp.	Potentially undescribed	The habitat of the recorded population was restricted to drainage lines of sandy loam soils, with no or very few stones, and an open lower stratum of tussock grasses and low shrubs	9~	35 from 23 locations	0	This species does not match reference specimens of any published species and has potential taxonomic significance. This entity is distinct in having elongated fruit. Fruiting specimens were collected in April and June 2022, indicating approximately a March-May flowering period. Flowering specimens were also collected in late June, though this could be considered a response to the unseasonably late rains of May 2022 rather than an indicator of usual flowering time. There are no other known populations of this entity, which may indicate that it is geographically restricted. A precautionary approach would see it regarded as a taxon of potential conservation significance, though this is not yet able to be formally assessed (Umwelt 2022a).
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	Mulga over mixed grassland. Emergent eucalypts and *Triodia* spp. grassland. Very open Mulga woodland over patchy mixed grasses. Floodplains, hardpan plains.	7~, 8, 9	53 from 49 locations	0 (3 recorded by Rapallo (2022c))	This species is widespread on Mulga plains. Locally, 13 populations of *Rhagodia* sp. Hamersley have been recorded within 3 km of the Proposal Area. There are 63 specimen records in the WAH database, with collection locations spread approximately 290 km extending between Tom Price and Newman (DBCA 2021). Fifty plants were recorded near the Great Northern Highway by Rapallo (2022c). The Rapallo (2022c) survey found 49 additional records in their targeted flora survey area of the Lamb Creek site with 3 plants been previously recorded in the Clearing Permit Area. Umwelt (2022a) however did not record any plants in their survey.
Hibiscus sp. Gurrinbiddy Range (M.E. Trudgen MET 15708)	P2	Rocky gullies, drainage lines and gorges with loamy skeletal soil	4~	17 from 2 locations	0	This taxon is known from 24 WA Herbarium records across 10 broad regional locations, two of which occur within DBCA-managed tenure within Karijini National Park, no records are within 10 km of the Study Area. This record of *Hibiscus* sp. Gurinbiddy Range (M.E. Trudge MET 15708) is a slight range extension of the known range of this taxon to the north.
Euphorbia aff. f*erdinandi*	Potentially undescribed	Often found in open woodland, *Acacia aneura* woodland, low shrublands, flats, in clay loam soil	8~, 7	60 individuals from 19 locations	0	This taxon was recorded from four locations near the Great Northern Highway. It was only recognised as a potentially undescribed species, and different from any known species, when the specimen was compared in detail with other Euphorbia specimens at the WAH. Further advice was sought from Steve Dillon at the WAH, who advised that the specimen differed from *Euphorbia ferdinandi* by having broader seeds and a stigma different from what has been described for this species (S. Dillon pers. comm., September 2021). All locations of this taxon were within the Flora and Vegetation Survey Area, but outside of the Development Envelope. The Rapallo (2022c) survey found 4 additional records in their targeted flora survey area of the Lamb Creek site.

˜ Designates preferred habitat based on proportional location representative and landforms/soils.

Species	Conservation Status	Habitat	Vegetation Types	No. of Individuals		Other previous records of species
				Survey Area (both surveys)	Clearing Footprint (Umwelt 2022a)	
Rostellularia adscendens var. latiflora	P3	Acacia shrubland, sometimes with Eucalypts and Corymbias, over shrublands and herblands, over tussock grassland, or *Triodia pungens* hummock grassland.	1	1	0	Local population has been assessed to be of low regional significance. The taxon has a distribution of approximately 450 km from west of Tom Price to north east of Meenthena Station. The species is known from 42 WA Herbarium records across more than 280 km from near Mt Farquhar (89 km north-west of Tom Price) to the Oakover River with at least six locations occur in the Karijini National Park. This taxon has been recorded approximately 20 km south-east of the Lamb Creek retention license on the MAC development Envelope (Umwelt 2022b). A single plant was recorded by Rapallo (2022c) within a minor flowline within the area of the proposed haul road. While the study area is within the known range of the taxon, Umwelt (2022a) however did not record any plants in their survey.

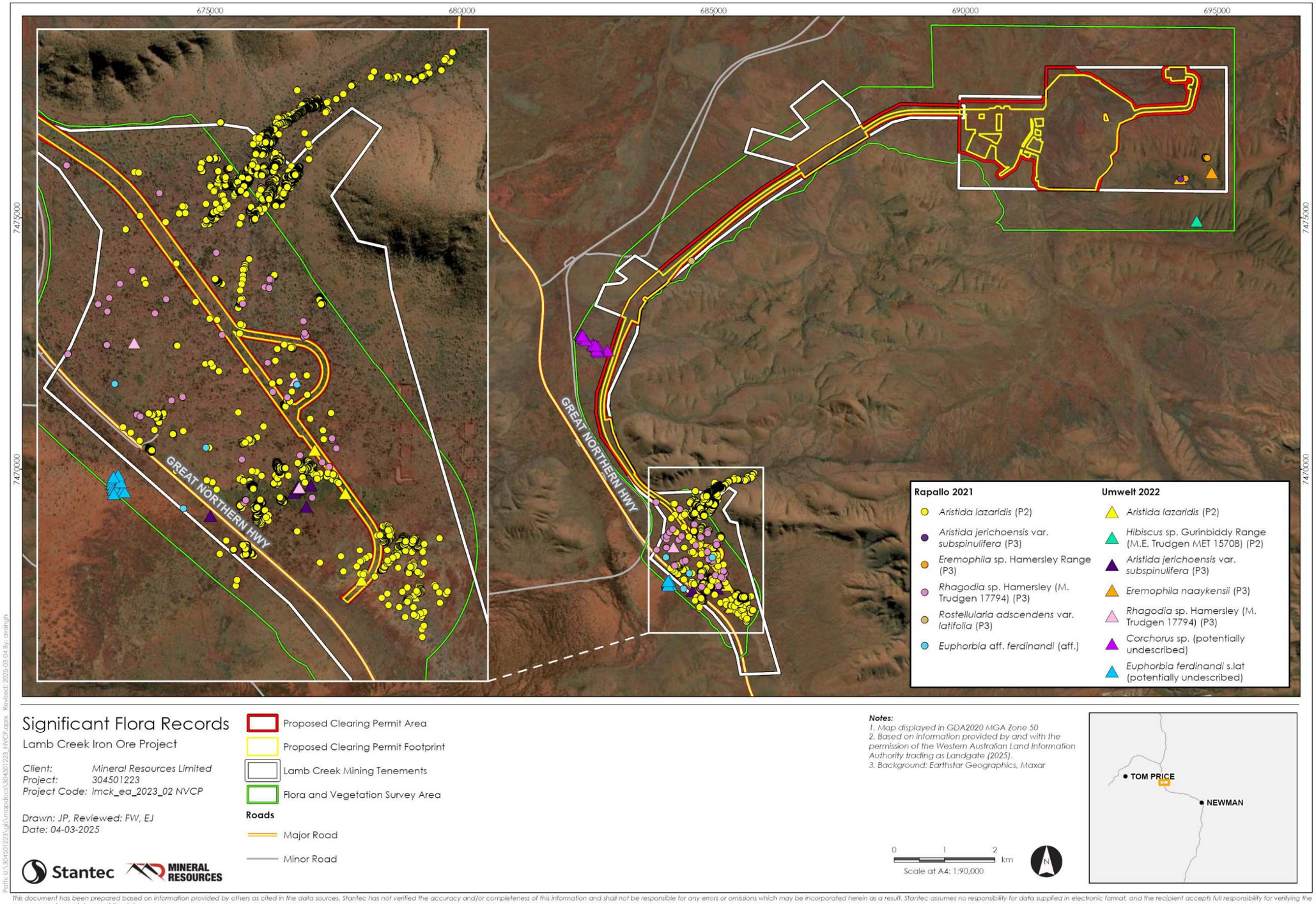

Figure 8: Conservation Significant Flora Records

4.7.3.3 Introduced Flora

In total, seven introduced flora species (weeds) have been recorded within the Study area (**Table 9**). None of these taxa were listed as Declared Pests (DPIRD 2020) or Weeds of National Significance (Commonwealth of Australia 2022). *Bidens bipinnata*, *Cenchrus ciliaris* and *C. setiger* were the most common introduced taxa in terms of numbers of locations and individuals recorded. Introduced flora were most commonly recorded in drainage areas (**Figure 9**). Whilst some of the introduced flora have a High/Rapid ecological impact and invasiveness ratings, no introduced taxa were widespread in the Study Area, and the vegetation was considered to be in mostly Excellent condition (Umwelt 2022a).

Table 9: Introduced Flora Recorded in the Umwelt (2022a) Flora and Vegetation Survey Area

Species	Common Name	Number of Locations	Number of individuals	Vegetation Type	Ecological Impact*	Invasiveness*
Bidens bipinnata	Bipinnate Begger's Tick	31	824	1, 2, 4, 6, 7, 9, 10	Unknown	Rapid
Cenchrus ciliaris	Buffel Grass	13	149	1, 4, 7, 10	High	Rapid
Cenchrus setiger	Birdwood Grass	17	2,654	1, 7, 10	High	Rapid
Malvastrum americanum	Spiked Malvastrum	11	70	1, 7, 10	High	Rapid
Portulaca pilosa	Pink Purslane	1	1	2	Not rated	Not rated
Setaria verticillata	Whorled Pigeon Grass	6	20	1, 7, 10	High	Rapid
Tribulus terrestris	Caltrop	3	5	7, 10	Unknown	Moderate

* Data from (Department of Biodiversity 2014)

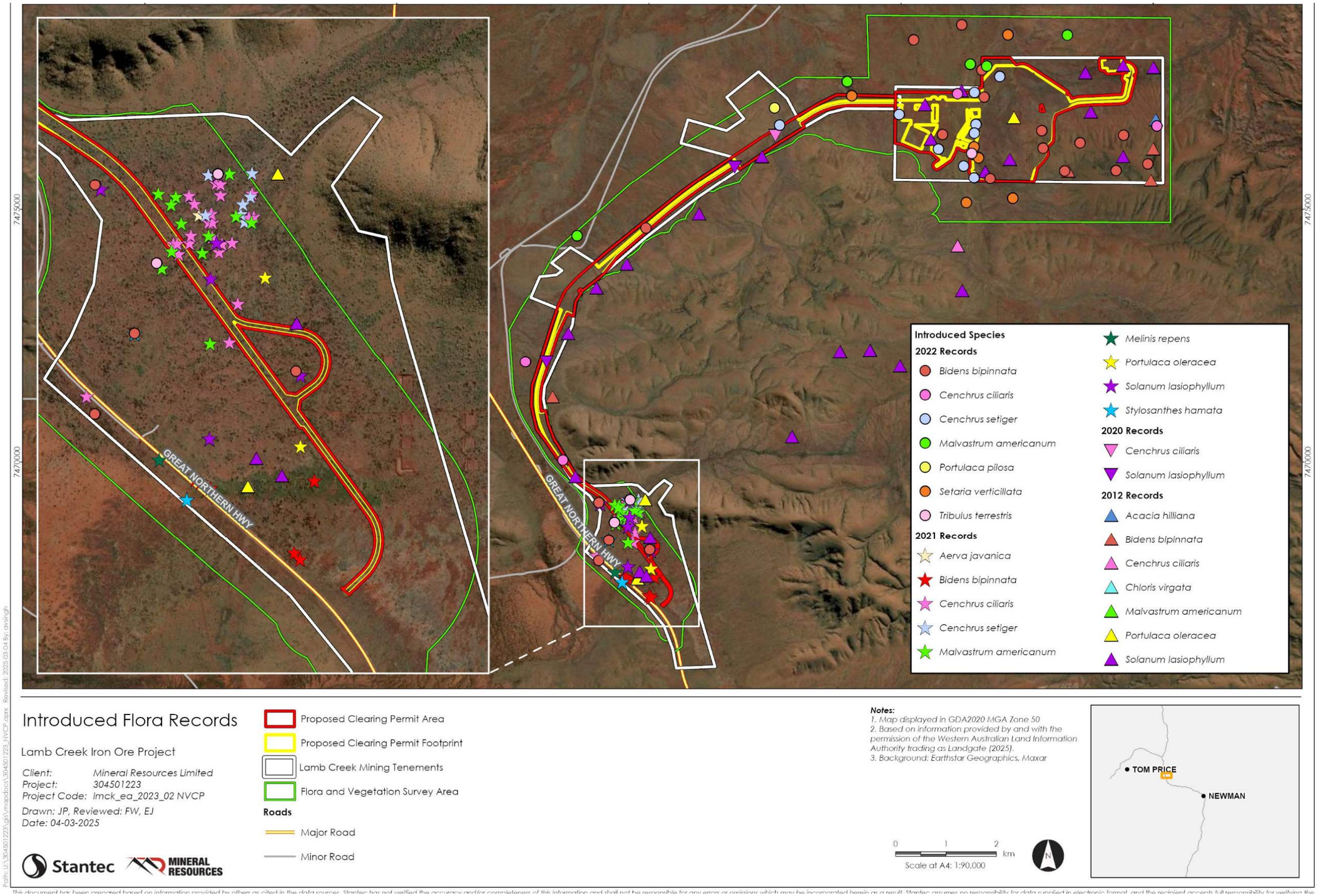

Figure 9: Introducted Flora Species Recorded in the Umwelt 2022 Flora and Vegetation Survey Area

4.8 Terrestrial Fauna

The proposed Clearing Permit Area has been subject to two detailed in-field surveys between 2012 and 2020 for terrestrial vertebrate fauna, and one detailed in-field survey in 2021 for Short Range Endemic (SRE) invertebrate fauna (**Appendix D**). In addition to this work, regional surveys undertaken in the vicinity of the Clearing Permit Footprint were collated to provide further contextual information. In total, two desktop assessments, two detailed terrestrial fauna surveys and one detailed SRE survey have been completed within the Clearing Permit Area.

4.8.1 Fauna Habitat

A total of 10 broad habitat types (excluding cleared areas) have been identified in the proposed clearing footprint (**Table 10**) (**Appendix D**) including:

• gorge, gully, and rocky breakaway;	• tussock grassland plain;
• hill crests and hill slopes;	• hummock grassland;
• stony plains;	• rocky ridge and gorge;
• drainage line (minor and medium);	• rocky hills and plateaus; and
• Mulga/*Corymbia* spp. plain;	• Mulga plain.

The following habitat features within the Terrestrial Fauna Survey Area are likely to be of importance to significant fauna and other fauna species in the region:

- gorges with surface water pools;
- caves (both deep and shallow for diurnal, nocturnal, and maternity roosts);
- rocky/pebble substrate;
- gullies;
- rocky outcrops;
- major watercourses; and
- open grassland and woodland.

Of the habitats recorded within the proposed Clearing Permit Area (**Table 10**), the rocky ridge and gorge habitat is considered to be important, however none of this occurs within the proposed Clearing Permit Area. The rocky ridge and gorge habitat may comprise caves and crevices for shelter, as well as breeding and roosting sites for several significant fauna species. This habitat is limited in its extent in the region, compared with other more widely occurring fauna habitats, such as stony plain. The drainage line habitat is also important habitat, although it is widespread in the region. The drainage line habitat is likely to support a greater abundance and diversity of fauna than surrounding habitats, and may provide a corridor for fauna movement. Any water present within drainage line habitats within the Clearing Permit Footprint would be ephemeral; therefore, is present only following major rainfall events.

Table 10: Broad habitat types within the Proposed Clearing Permit Area (Rapallo 2022b)

Habitat Type	Description	Value To Significant Fauna	Suitability for SRE Fauna	Extent In Terrestrial Fauna Survey Area (ha)(%)	Proposed Clearing Permit Area (ha)(%)	Indicative Clearing Footprint (ha)(%)
Gorge, gully, and rocky breakaway	Wide rocky gullies and gorges that bisect the hillcrest / hillslopes of the higher elevation areas containing caves, deep cracks, and crevices. Breakaways occur at the rugged edges of hillslopes. Spinifex hummock grassland with mixed shrubland patches or occasional *Ficus* spp. occurring in shaded locations or occasional *Eucalyptus leucophloia*.	**High value** • Potential foraging and dispersal habitat for Pilbara Olive Python, Northern Quoll, Ghost Bat and Peregrine Falcon. • Potential breeding habitat for Pilbara Olive Python, Northern Quoll and Peregrine Falcon. • Potential shelter habitat for Pilbara Olive Python and Northern Quoll. • Potential habitat for Pilbara Barking Gecko (*Underwoodisaurus seorsus*) and Gane's Blind Snake (*Anilios ganei*).	moderate to high	54.68 (3.32%)	0.0 (0.0%)	0.0 (0.0%)
Hillcrests / hillslope	Slopes and hill crests of higher elevation areas. Spinifex hummock grassland dominated with scattered *Eucalyptus leucophloia* trees and mallee, and *Acacia* spp. and *Grevillea* spp. shrubs on rocky, red skeletal soils (loams to clay/loam).	**Moderate value:** • Possible foraging and dispersal habitat for Ghost Bat, Western Pebble-mound Mouse and Northern Quoll. • Possible breeding habitat for Western Pebble-mound Mouse.	low	319.01 (19.39%)	61.63 (7.2%)	52.49 (8.2%)
Mulga / *Corymbia* spp. plain	Open Mulga shrubland patches over spinifex hummock or tussock grassland on loam to sandy clay loam occurring in areas of sheet flow drainage. The Mulga patches are surrounded by run-off zones of stonier plain with open spinifex / tussock grassland under very open Mulga / *Corymbia deserticola* shrubland.	**Moderate value:** • Possible foraging and dispersal habitat for Ghost Bat and Grey Falcon. • Possible habitat for Gane's Blind Snake.	medium	291.15 (17.70%)	252.65 (29.3%)	180.77 (28.3%)
Minor drainage	Smaller narrow drainage channels and shallow gullies that bisect the stony plain habitat and hill slopes, forming flow zones on the valley floor. Mixed open shrubland, to shrubland often over tussock grass and herbs with occasional fringing trees (scattered *Eucalyptus leucophloia*, *Corymbia* spp. or *Eucalyptus gamophylla*).	**Moderate value:** • Possible foraging and dispersal habitat for Ghost Bat, Grey Falcon, Peregrine Falcon, Pilbara Olive Python and Northern Quoll.	low	210.61 (12.80%)	92.21 (10.7%)	75.25 (11.8%)
Tussock grassland plain	Tussock grass (*Aristida inaequiglumis*, *Aristida contorta, Themeda triandra*) dominated, largely undefined drainage plain. Contains occasional open Mulga woodland stands or scattered Mulga individuals on brown sandy clay loam to loams. Contains patches of spinifex.	**Moderate value:** • Potential foraging and dispersal habitat for Ghost Bat, Grey Falcon and Peregrine Falcon. • Potential habitat for Gane's Blind Snake.	medium	137.93 (8.38%)	6.80 (0.8%)	5.34 (0.8%)
Medium drainage	Wide loamy drainage channels to undefined drainage (gravelly) containing occasional emergent *Corymbia hamersleyana* over patches of low mixed shrubs over Buffel Grass and tussock grass dominated understory on low relief. Contains very occasional Mulga stands in loamier soils.	**Moderate value:** • Potential foraging and dispersal habitat for Ghost Bat, Grey Falcon, Pilbara Olive Python, Northern Quoll and Peregrine Falcon. • Potential breeding and nesting habitat for Grey Falcon. • Potential habitat for Gane's Blind Snake.	moderate to low	113.06 (6.87%)	69.06 (8.0%)	43.41 (6.8%)
Stony plain	Plains and lower slopes of spinifex hummock grasslands (or in small patches, tussock grass) on red sandy clay loam to loam soil. Typically, with a mantle of gravel (less so on the valley floor adjacent to drainage, where soils are loamier). Little to no overstory aside from scattered trees or patches of mixed shrubs often regenerating from fire. Generally, *Eucalyptus leucophloia* occurs on the slopes and *Eucalyptus gamophylla* on lower slopes, with *Corymbia hamersleyana* typically associated with drainage.	**Low value:** • Foraging and dispersal habitat for Ghost Bat, Grey Falcon, Western Pebble-mound Mouse and Pilbara Olive Python. • Possible breeding and shelter habitat for Western Pebble-mound Mouse.	Moderate to low	517.94 (31.48%)	360.45 (41.9%)	266.35 (41.7%)
Road/ Bitumen	NA	**NA**	NA	n/a	0	0

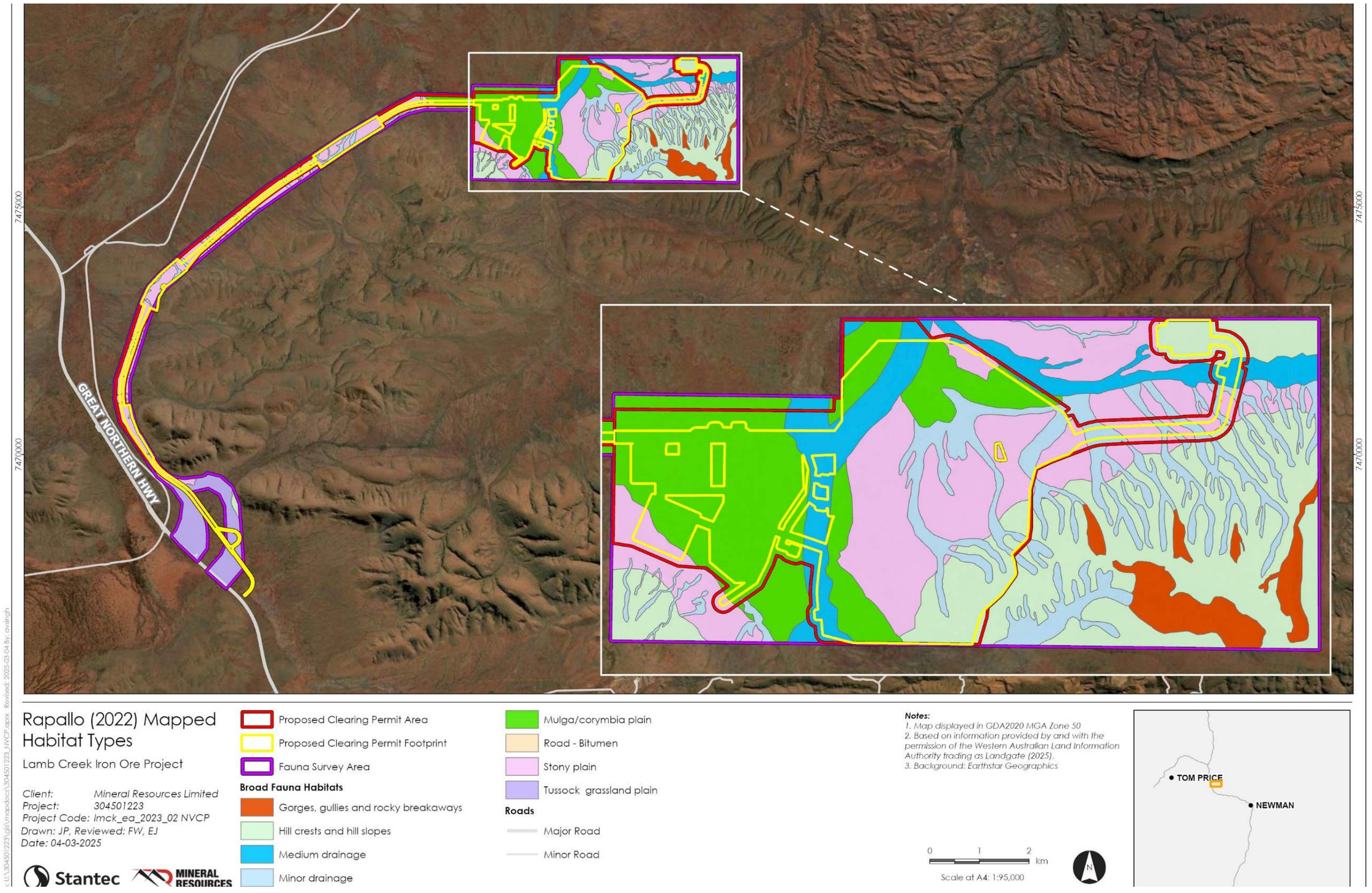

Figure 10: Fauna Habitats in the Clearing Permit Area

4.8.2 Fauna assemblage

There are 29 conservation significant fauna species listed under the WA BC Act and the Commonwealth's EPBC Act that have been identified as potentially occurring within the proposed Clearing Permit Area (Rapallo 2012a;2021b). Of these 29 species, one mammal and one bird species have been confirmed to occur (**Figure 11**).

4.8.3 Conservation Significant Fauna recorded in Clearing Permit Area

Two fauna species of significance were confirmed as occurring within the Clearing Permit Area based on the fauna identified in the field surveys (Rapallo 2012a;2021b):

- Western Pebble-mound Mouse (*Pseudomys chapmani*); and
- Fork-tailed Swift (*Apus pacificus*).

4.8.3.1 Western Pebble-mound Mouse

The Western Pebble-mound Mouse is listed as P4 under the BC Act. The species is currently restricted to the non-coastal central, eastern and southern parts of the Pilbara bioregion, occurring in ranges containing gentle stony slopes, often associated with *Acacia* spp. lined minor drainage areas (van Dyck and Strahan 2008). The tussock grasslands and stony plains habitats are most likely to support this species. This habitat is considered common within the proposed Clearing Permit Area, and there is widespread occurrence of suitable habitat for the species within the region (Woinarski *et al.* 2014).(Mitchell *et al.* 2002).

The Western Pebble-mound mouse was recorded during both Rapallo (Rapallo 2012a;2021b) in-field surveys, with 40 mounds recorded across the broader proposed Clearing Permit Area from within stony plains habitat (**Figure 11**). This species is widespread in the broader region and has also been recorded numerous times at Mining Area C (Biologic 2017) situated approximately 15 km from the proposed Clearing Permit Area (**Figure 1**).

4.8.3.2 Fork-tailed Swift

The Fork-tailed Swift is listed as Migratory under the BC Act and the EPBC Act. The species has been recorded within the proposed Clearing Permit Area and it is likely to forage above the proposed Clearing Area during summer (Johnstone and Storr 1998). As the species is entirely aerial, the Project is not expected to impact the species; therefore, the Fork-tailed Swift has not been considered further.

4.8.4 Conservation Significant Fauna likely to occur in Clearing Permit Area

In addition to the two species of significance recorded from the detailed in-field surveys, another eight fauna species of significance are considered likely to occur within the Clearing Permit Area, namely:

- Ghost Bat (*Macroderma gigas*) – Vulnerable (BC Act and EPBC Act);
- Northern Quoll (Dasyurus hallucatus) – Endangered (BC Act and EPBC Act);
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) – Vulnerable (BC Act and EPBC Act);
- Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable (BC Act and EPBC Act);
- Gane's Blind Snake (*Anilios ganei*) – Priority 1 (BC Act);
- Pilbara Barking Gecko (*Underwoodisaurus seorsus*) – Priority 2 (BC Act);
- Grey Falcon (*Falco hypoleucos*) – Vulnerable (BC Act and EPBC Act); and
- Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected (BC Act).

Fauna habitats are not restricted to the Clearing Permit Area and all habitats recorded in the broader Terrestrial Fauna Survey Area extend the Survey Area boundary. Suitable habitat for the Gane's Blind Snake Pilbara Barking Gecko, Grey Falcon and Peregrine Falcon occur in the Clearing Permit Area. The habitat within the proposed clearing area is not likely to be significant habitat or necessary for the maintenance of a significant habitat for these species and they are therefore not considered further.

4.8.4.1 Ghost Bat

The Ghost Bat is listed as Vulnerable under the BC Act and the EPBC Act. The Pilbara population of the Ghost Bat is considered an important population as it is genetically distinct and divergent (TSSC 2016). No Ghost Bat roosts were identified within the Clearing Permit Area during the in-field fauna surveys although five caves were being utilised by the Ghost bat outside of the Clearing Permit Area, but within the Terrestrial Fauna Survey Area (Rapallo 2012a;2022b). Bat Call WA in Rapallo (2022b) assigned the five Ghost Bat caves as the following cave type and habitat classification (Phoenix Environmental Services 2022):

- Ghost Bat roost cave recorded within the Terrestrial Fauna Survey Area:
  - Cave 1 (LC002) – Category 2 (situated approximately 730 m from the proposed pit); and
  - Cave 3 (LC001) – Category 3 (situated >1 km from proposed pit).
- Ghost Bat roost cave recorded outside of the Terrestrial Fauna Survey Area:
  - Cave 2 – Category 3;
  - Cave 4 – Category 3 (apartment block); and
  - Cave 5 – Category 2.

The closest distance from the proposed pit to a Ghost Bat cave is 729 m (Cave 1; Category 2). The same cave is located 350 m from a WRL and diversion bund. The remaining caves in proximity to the proposed pit are greater than 1 km away. Cave 4 and Cave 5 are located 202 m and 237 m, respectively, from the haul road (**Figure 11**). All caves will be retained.

Although the Ghost Bat has not been recorded within the Clearing Permit Area, the Ghost Bat will likely forage over all habitats present within the area. All areas of broad fauna habitats within the Clearing Permit Area are considered supporting habitat for Ghost Bat (of which 638.4 ha occurs in the Clearing Footprint.).

4.8.4.2 Northern Quoll

The Northern Quoll is listed as Endangered under the EPBC Act and BC Act. It is currently moderately common within the Pilbara and is found within 150 km of the coast where suitable rocky habitat occurs. The Pilbara population of Northern Quoll is genetically distinct from the nearest Kimberley population and is considered as important population as these are outside of the predicted range of cane toads (Hill and Ward 2010).

The Northern Quoll was recorded within the Terrestrial Fauna Survey Area during 2012 (Rapallo 2012a); however, no evidence of the species was found during the 2020 survey (Rapallo 2022b). The Northern Quoll has not been recorded within the Clearing Permit Area despite systematic trapping and active searches for Northern Quoll in 2012 and 2022 (Rapallo 2012a;2022b). However, Northern Quoll has been recorded on a motion camera approximately 5 km southwest of the proposed pit, and has been recorded infrequently at Mining Area C (show in **Figure 1)**, with all records being from scats (Biologic 2017).

The paucity of records within the Clearing Permit Area, and adjacent areas, combined with the lack of confirmed records (i.e. observations of individuals), suggests that the species is likely to occur in low numbers, if a permanent population occurs, or that the records to date have been made by individuals dispersing from nearby populations. The Pilbara population of Northern Quolls is considered to be an important population based on the records occurring in habitat which is free from cane toads and is therefore considered important for the long-term survival of the Northern Quoll (Hill and Ward 2010).

4.8.4.3 Pilbara Leaf-nosed Bat

The Pilbara Leaf-nosed Bat is listed as Vulnerable under the BC Act and the EPBC Act. The Pilbara Leaf-nosed Bat population of the Pilbara and Gascoyne regions is considered an important population as it comprises multiple colonies that form one interbreeding population (Threatened Species Scientific Committee 2016). No Pilbara Leaf-nosed Bat individuals have been recorded in surveys of the Terrestrial Fauna Survey Area; however, the species is considered likely to occur as a foraging visitor throughout the Clearing Permit Area, particularly along major creeks.

The Clearing Permit Area is unlikely to contain important roost habitat for this species and no roosts for this species were recorded in the rocky ridge and gorge habitat in the Clearing Permit Area. Despite extensive survey effort completed at Mining Area C (15 km from the Proposed Action Area as shown in **Figure 1**) the species was only recorded twice as a foraging visitor (Biologic 2017). The nearest high concentration of records for this species

occurs at Gudai-Darri, approximately 29 km north of the Clearing Permit Area, which is thought to contain a potential roost site in an old mine adit.

4.8.4.4 Pilbara Olive Python

The Pilbara Olive Python is listed as Vulnerable under the BC Act and the EPBC Act. Suitable denning habitat for this species within the Terrestrial Fauna Survey Area comprises gorges, gullies and rocky breakaways, with drainage line habitat used for foraging and dispersal. The Pilbara Olive Python was not recorded in the Clearing Permit Area during field surveys but was recorded approximately 3 km south of the proposed pit (**Figure 11**). Biologic (2017) recorded Pilbara Olive Python from Mining Area C from four records (15 km from the Proposed Action Area as shown in **Figure 1**). This species favours areas with permanent water holes (which are absent from the Clearing Permit Area) in rocky ranges or along rivers and is considered likely to occur in the Proposed Action Area at least as a foraging visitor (Rapallo 2022b).

4.8.5 Short Range Endemics

The following seven broad habitat types were identified as having the potential to support SRE invertebrate fauna and were assessed during the SRE invertebrate fauna survey (**Appendix D**):

- gorges, gullies, and rocky breakaways;
- minor drainage lines:
- medium drainage lines
- hillcrests and hillslopes;
- stony plain;
- tussock grassland plain; and
- Mulga/Corymbia spp. plain.

Table 11 shows the breakdown of these habitats within the Terrestrial survey area. Of the SRE habitats assessed, the stony plain habitat type is the most extensive habitat within the proposed Clearing Permit Area, covering 360.5 ha (41.9%). Factors that contribute to the presence of suitable microhabitats for SREs include southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges and riparian vegetation. Within the proposed Clearing Permit Area, suitable microhabitats with a high probability of supporting SRE species include gorges, gullies, and rocky breakaways (**Figure 11**). Some habitats assessed within the proposed Clearing Permit Area have also experienced disturbance through selective clearing for tracks, drill pads, and laydown areas associated with exploration activities (Rapallo 2022a). No SRE habitats identified are confined or restricted to the proposed Clearing Permit Area.

Table 11: SRE Habitat Suitability within the Terrestrial Fauna Survey Area

SRE Habitat Type	Extent in Terrestrial Fauna Survey Area (ha)(%)	SRE Habitat Suitability
Gorges, gullies, and rocky breakaways	54.68 (3.32%)	• The deepest gullies in the Terrestrial Fauna Survey Area occur on the south-eastern corner within a north-west and northern-facing slope. Within the Terrestrial Fauna Survey Area, this habitat type is not isolated with no gorges, terminal gorges or gullies. • Suitability for SRE is rated as moderate to high. This broad habitat type is not restricted to the Terrestrial Fauna Survey Area, and the habitat type contains at least two microhabitat factors.
Minor drainage lines	210.61 (12.80%)	• Despite some patchy shading from vegetation, the minor drainage lines assessed had low soil moisture levels, low accumulated litter, and generally gravelly soils. Connectivity of minor drainage is high as the drainage lines flow fast after significant rainfall into a network of drainage. • Suitability for SRE is low based on low protection and low isolation. This broad habitat type is not restricted to the survey area.

SRE Habitat Type	Extent in Terrestrial Fauna Survey Area (ha)(%)	SRE Habitat Suitability
Medium drainage lines	113.06 (6.87%)	• In the Terrestrial Fauna Survey Area, detritus and litter within this habitat was sparse or in piles without accumulated soil-indicating recent fast flow and little opportunity for soil and fine detritus to accumulate. • Suitability for SRE is moderate to low based on medium to low protection and low isolation. This broad habitat type is not restricted to the Terrestrial Fauna Survey Area.
Hillcrests and hillslopes	319.01 (19.39%)	• Steep, south-facing hill slopes can provide a degree of protection; however, within the Terrestrial Fauna Survey Area there are no areas of high elevation that are steep, south facing and constantly shaded. Within the Terrestrial Fauna Survey Area, this habitat type is continuous (not isolated). • Suitability for SRE is low based on low protection and low isolation and this broad habitat type is not restricted to the survey area.
Stony plain	517.94 (31.48%)	• In the Terrestrial Fauna Survey Area, there are no areas of continuous shade occurring within this habitat due to topography. Within the Terrestrial Fauna Survey Area, this habitat type is continuous not isolated. • Suitability for SRE is moderate to low suitability based on low - medium protection and low isolation. This broad habitat type is not restricted to the Terrestrial Fauna Survey Area.
Tussock grassland plain	137.93 (8.38%)	• Mulga stands within the Terrestrial Fauna Survey Area provide shade; however, the stands are not extensive or thick, therefore the shade is patchy as is the accumulated litter. The soils are loamier than the surrounding habitats, so there are areas of higher soil moisture under the bigger mulga stands. • Suitability for SRE is medium based on low isolation and medium protection. This broad habitat type is unlikely to be restricted to the Terrestrial Fauna Survey Area.
Mulga/*Corymbia* spp. plain	291.15 (17.70%)	• Mulga stands within the Terrestrial Fauna Survey Area provide shade; however, the stands are not extensive or thick, therefore the shade is patchy as is the accumulated litter. • Suitability for SRE is medium based on low isolation and medium protection. This broad habitat type is unlikely to be restricted to the Terrestrial Fauna Survey Area.

A total of 25 possible SRE taxa were collected from within the Terrestrial Fauna Survey Area during field surveys and 16 possible SRE taxa were recorded in the Clearing Permit Area (Rapallo 2012a; 2022a). These potential SRE taxa are presented in **Appendix E**. The Mulga shrubland patches within the Mulga / Corymbia spp. plain habitat yielded the highest abundance and taxa richness of SREs, followed by stony plain, although survey effort was not uniform across habitats (Rapallo, 2022a).

No confirmed SRE invertebrate taxa were collected from the Terrestrial Fauna Survey Area or the Clearing Permit Area (Rapallo 2022a). Despite 16 possible SRE taxa being recorded in the Clearing Permit Area (**Appendix E**), habitat connectivity across the landscape suggests that the potential SRE taxa found in these habitats are likely to have their distributions extending outside the Clearing Permit Area (Rapallo 2022a).

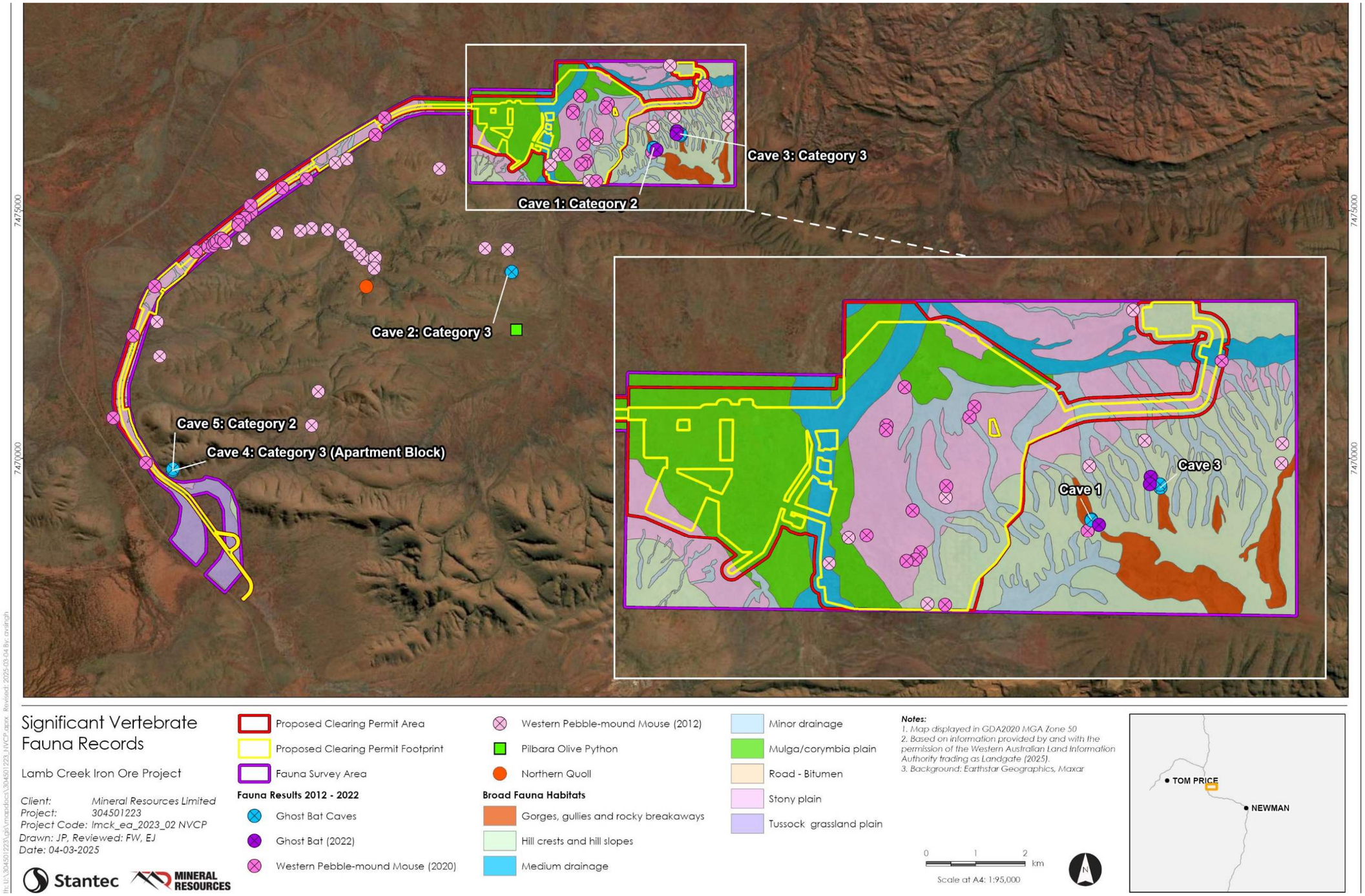

Figure 11: Significant Vertebrate Fauna Records within the Proposed Clearing Permit Area and Surrounds

5. ENVIRONMENTAL MANGEMENT MEASURES AND REHABILITATION

5.1 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under Part V of the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).
In addition to the matters considered in accordance with section 51O of the EP Act, MinRes has also had regard for the below statutes, polices and guidelines:

Other Legislation of relevance for assessment of native vegetation clearing includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act);
- *Conservation and Land Management Act 1984* (WA) (CALM Act);
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act);
- *Soil and Land Conservation Act 1945*;
- *Rights in Water and Irrigation Act 1914*; and
- *Aboriginal Heritage Act 1972.*

Other Relevant policies and guidance documents to this Project include:

- Environmental Offsets Policy (Government of Western Australia 2011);
- A guide to the assessment of applications to clear native vegetation (Department of Environment Regulation 2014);
- Procedure: Native vegetation clearing permits (Department of Water and Environmental Regulation 2021);
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority 2016b);
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (Environmental Protection Authority 2020); and
- Approved Recovery Plans for threatened species.

5.2 Mitigation

MinRes has applied the EPA's mitigation hierarchy (avoid, minimise, rehabilitate, offset) during the design, planned construction and operation of the Project to reduce the potential impact to key environmental factors including Flora and Vegetation, Terrestrial Fauna, Inland Waters and Social surrounds. These management measures are detailed in subsequent sections.

5.2.1 Land Clearing and Flora Management

MinRes will ensure all clearing and ground disturbance is carried out in accordance with the LAP and Clearing Procedures. Vegetation clearing will be implemented in accordance with the Construction Environmental Management Plan (CEMP) during the construction phase of the Proposal. Clearing and ongoing operations for the Lamb Creek Project will also be undertaken in accordance with the Flora and Vegetation Management Plan (FVMP, **Appendix F**) developed for the site. The following actions will be implemented to minimise and manage impacts to native vegetation as a result of clearing (further detail provided in FVMP):

Avoid:

- Proposed clearing has been minimised as far as practicable to reduce the extent of disturbance required; the Proponent has reduced the Clearing Permit Area from 1,386 ha to 861 ha.
- A LAP and Land Clearing Procedure will be implemented to ensure all clearing works are compliant with regulatory requirements and are within approved boundary.

- 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.

Minimise:

- Spatially restricted footprint and short life of mine.
- Implement Flora and Vegetation Management Plan (FVMP)
- Follow management measures within the CEMP and Operations Environmental Management Plan (OEMP) with respect to clearing native vegetation.
- Clearing awareness training undertaken by all personnel involved in clearing activities.
- Vegetation clearing shall be kept to the minimum amount required, as far as practicable.
- Where significant flora taxa populations cannot be avoided, as may be the case with *Aristida lazaridis (*P2), infrastructure should be placed to avoid the highest densities, ensuring surface water flow is maintained.
- Significant flora populations and the area to be cleared shall be clearly demarcated and machinery operators made aware of the operational boundary, following confirmation with the relevant manager.

Rehabilitate:

- Implement an appropriate rehabilitation plan (surface treatments; seed selection, collection, storage and management) in accordance with the approved Mine Closure Plan (MCP).
- Progressive rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable.
- Salvage and stockpile soil and/or habitat features (e.g. vegetation, stumps, logs, boulders) for use in rehabilitation programs.

5.2.2 Weed Management

MinRes will aim to prevent the introduction of weeds and limit the spread of weeds in the proposed Clearing Permit Area as far as practicable. The following management actions will be implemented to minimise the risk of introduced flora resulting from the Project (further detail provided in FVMP):

Avoid:

- A LAP and Land Clearing Procedure will be implemented to ensure all clearing works are compliant with regulatory requirements and are within approved boundary.

Minimise:

- Implement FVMP.
- A Weed Management Plan shall be prepared and implemented as part of the FVMP, prior to construction and operation, to control access and movement of vehicles and construction personnel to prevent the introduction and spread of weeds into the proposed Clearing Permit Area, weed free areas, and between work areas.
- Vehicles with ground engaging equipment to be cleaned, inspected and issued with a Weed Hygiene Certificate prior to entry to site or moving between areas on-site.
- Vehicles and equipment shall be restricted to designated roads and tracks.
- Weed awareness and weed hygiene training shall be delivered to all personnel as part of the induction process.
- Regular inspection and maintenance of vehicles and equipment shall be undertaken.
- Restrict movement of topsoil at known weed locations.
- Ensure timely response for the management of any declared weed occurrences or other weed infestations occurs.

Rehabilitation:

- Seasonal weed control programs shall be implemented, including herbicide spraying or physical removal, as required.
- Progressive rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable.

5.2.3 Management for Terrestrial Fauna

MinRes will aim to ensure fauna species are not adversely affected, via either direct impacts or impacts to habitat as far as practicable. Clearing and ongoing operations for the Lamb Creek Project will also be undertaken in accordance with the Significant Fauna Management Plan (SFMP, **Appendix G**) developed for the site. The following management actions will be implemented to minimise the potential impacts on fauna:

Avoid:

- The proposed Clearing Permit Area has been minimised as far as practicable to reduce the extent of disturbance required; the Proponent has revised the Clearing Permit Area from 1,386 ha to 861 ha.
- Implement a 100 m radius exclusion zone around recorded Category 2 and Category 3 Ghost Bat roosts.
- Temporary closure of Cave 1 during construction and operation – a geotechnical assessment (peak particle velocity-PPV) of Cave 1 indicating that the conservative limit of 25 mm/sec PPV (Bat Call WA 2023) to maintain structural integrity of the cave will be met. This is considered to be an acceptable method (i.e. exclusion from using cave) to avoid impacts to nesting Ghost Bats (Bat Call WA 2023). This indicates that once the cave is reopened, the Ghost Bats are likely to return.
- Avoid placement of infrastructure in any habitat of high significance, where practicable.
- A LAP and Land Clearing Procedures will be implemented to ensure all clearing works are compliant with regulatory requirements and are within approved boundary.
- 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, pegging of clearing boundaries, supplemented with other control measures such as the use of spotters and/or restricting clearing to the daylight hours will be used to prevent unauthorised clearing.
- Habitat and fauna surveys have been undertaken to identify key areas and species to avoid.

Minimise:

- Implement Significant Fauna Management Plan (SFMP).
- Closure of Cave 1 is likely to be closed by using a lightweight steel frame fitted to the entrance and bird avery steel netting or any heavier style with apertures not exceeding 100 mm. This would exclude Ghost bats but smaller species up to 10 g such as Pilbara leaf-nosed bats (*Rhinonicteris aurantia*) or Finlayson's cave bat (*Vespadelus finlaysoni*) would be able to pass through unharmed. Other small fauna of a similar size including reptiles, frogs and snakes would also be able to access the cave. With regard to larger fauna such as Quolls, Dingoes and/or Macropod species that will be excluded by the closures, Lamb Creek Cave 1 is situated in an area with numerous alternative deep overhangs and shallow caves that are suitable for their foraging and/or resting activities. Each of these species is known to travel significant distances on a daily basis (Bat Call WA 2023).
- Clearing awareness training is to be undertaken by all personnel involved in clearing activities, including specific information on significant flora within the Clearing Permit Area, the requirements for clearing, and the LAP and Land Clearing Procedure processes.
- Vegetation clearing shall be kept to the minimum amount required, as far as practicable.
- Clearing extents and approved ground disturbance areas shall be pegged by qualified surveyors in the field prior to ground disturbance commencing.

- In unpegged areas, the use of GPS guided machinery or other control measures such as the use of spotters and/or restricting clearing to the daylight hours will be used, provided the appropriate LAP and Land Clearing Procedure processes have been followed.
- Vehicles and equipment shall be restricted to designated roads and tracks.
- 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.

Rehabilitate:

- Implement an appropriate rehabilitation plan (surface treatments; seed selection, collection, storage and management) in accordance with the approved MCP.
- Progressive rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable.
- All bores shall be capped.

5.2.4 Dust Deposition on Vegetation Management

MinRes will minimise degradation of vegetation through dust deposition as far as practicable through the implementation of the following measures:

Avoid:

- Intersection of the haul road with the Great Northern Highway, and the remainder of the access road up to the operational area within M47/1592 will be sealed to reduce the generation of dust.
- Road haulage iron ore loads will be covered.
- Ground clearing (including topsoil stripping) shall not be undertaken during periods of high wind.
- A LAP and Land Clearing Procedure will be implemented to ensure all clearing works are compliant with regulatory requirements and are within approved boundary.

Minimise:

- Spatially restricted footprint and short life of mine.
- Implement the FVMP.
- Vehicles and equipment shall be restricted to designated roads and tracks.
- Dust suppression shall be implemented to manage dust emission on cleared areas, unsealed roads and iron ore handling areas.
- Speed limits shall apply on unsealed roads.

Rehabilitate:

- Implement an appropriate rehabilitation plan (surface treatments; seed selection, collection, storage and management) in accordance with the approved MCP.
- Progressive rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable.

5.2.5 Soil and Topsoil Management

The following soil management will be implemented as recommended by (MBS Environmental 2021):

- Soil from all disturbance areas can be stripped and used as a plant growth medium for rehabilitation purposes. Subsoils from the pit and WRD areas are physically, chemically, and structurally very similar to the topsoils and thus can also be harvested for rehabilitation purposes.
- If shallow loams present in the northern part of the proposed Clearing Permit Area are to be harvested, these could be co-mingled with stony soils from elsewhere as both soil types are physically and chemically similar in nature. However, it would be advisable to separately stockpile these should a need for less stony soil be identified.
- Within the pit area, excavation was typically possible up to a depth of around 900 mm. Excavation depths indicate that soils should be harvestable to a depth of at least 1,000 mm within the footprint of the WRL 1. Excavation of up to 2,000 mm is considered possible within the WRL 2 footprint.
- Volumes harvested from the pit shell may be sufficient for rehabilitation and closure commitments. In this circumstance, excavation of 200 mm within the WRD footprints is considered sufficient to meet regulatory expectation of good practise in soil resource management.

5.2.6 Water Management

The proposed Clearing Permit Area is not located within any major drainage lines or watercourses; therefore, clearing is not expected to impact surface water flows. Additionally, the proposed clearing is not located in proximity to any Public Drinking water Source Areas.

As impacts to Inland Waters associated with the Project are expected to be negligible, with a spatially restricted clearing area and a short life of mine, the key mitigation measures are mostly associated with management strategies. Operational impacts will be managed through a licence issued under Part V of the EP Act.

5.2.6.1 Groundwater:

The following management measures will be implemented to minimise potential impacts associated with groundwater drawdown.

Avoid:

- Groundwater drawdown is unavoidable.
- No groundwater dependent vegetation was identified from the proposed Clearing Footprint, avoiding impacts to this GDE type.

Minimise:

- Short life of mine.
- Implement groundwater management strategies in accordance with the Groundwater Operating Strategy (GWOS).
- Groundwater abstraction for pit dewatering will be managed in accordance with a *Rights in Water and Irrigation Act 1914* (RIWI Act) groundwater licence and associated GWOS.
- Hydrogeological assessments will continue to be undertaken to inform progressive dewatering requirements.

Rehabilitate:

- Groundwater is expected to recover to a substantial extent within 3 years of cessation of dewatering, and to recover back to original Standing Water Level (SWL) within five to 30 years.
- The open pit will be backfilled to a minimum of 5 m above the baseline groundwater level, to manage residual drawdown following groundwater recovery.
- Implement an appropriate rehabilitation plan in accordance with the approved MCP. Rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable.

5.2.6.2 Surface Water

The design and implementation of the Project will incorporate management actions to minimise or mitigate any adverse changes in existing flow regime, flood characteristics, scour, siltation and erosion of the drainage channels, inundation of areas upstream and water starvation of areas downstream of the Project, as well as minimise impacts to groundwater as follows:

Avoid:

- Access road crossing of Mine Creek designed so as not to impede normal surface water flow.

Minimise:

- Culverts and floodways along access roads will maintain existing flood characteristics and maintain natural flow volumes.
- There is not anticipated to be any excess groundwater requiring discharge to the environment, minimising impacts to natural hydrological regimes, as well as impacts to any temporary aquatic biota (e.g. sediment loading), where present.
- Any runoff or rainfall required to be discharged to the environment (e.g. during a 10% AEP flood event) will be captured by bunding and diverted to settling ponds and sediment traps, located downstream of the mine disturbance area (outside of the 1% AEP floodplain of major drainage lines), prior to being released to the environment to reduce impacts to any temporary aquatic biota (e.g. sediment loading), where present.
- Any runoff or rainfall that accumulates in the pit will be used for dust suppression and/or as process water in the first instance. However, during rare rainfall events, there may be a requirement for short-term discharge to a local drainage line after passing through settling ponds and sediment traps, so as to limit impacts to natural hydrological regimes, as well as impacts to any temporary aquatic biota (e.g. sediment loading), where present.
- Sediment traps will be designed to remove particles greater than, or equal to, 75 µm from surface water prior to release to the environment.

Rehabilitate:

- Rehabilitate surfaces to align with original topography, as far as practicable.
- Implement an appropriate rehabilitation plan in accordance with the approved MCP.
- Progressive rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable.
- A MCP will be implemented to ensure that closure design aligns with regulatory expectations, including partial backfilling of the pit to avoid the development of a pit lake.

5.2.7 Hydrocarbon Management

There are no anticipated impacts from the Proposal on surface or groundwater quality as a result of contamination. Hydrocarbons will be managed to avoid leaks and spills through the use of bunds, location of bunded areas either outside floodplains or appropriately elevated to avoid the risk of inundation. Fuel / chemical storage and transfer will occur within designated bunded areas. Off road driving will be avoided. In addition, waste rock is not anticipated to contain potentially acid forming PAF or acid sulphate soil (ASS) material and seepage is not expected to occur due to the presence of drainage bunds to direct water away from the mining area as soon as practicable.

5.2.8 Rehabilitation

Progressive rehabilitation of disturbed areas will be undertaken throughout the life of mine, as far as practicable. Rehabilitation will be undertaken in accordance with the approved MCP through the implementation of an appropriate rehabilitation plan including (surface treatments; seed selection, collection, storage and management). Rehabilitation activities will aim to meet post closure land use objectives. MinRes will:

- continue to consult with key stakeholders throughout the life of the Project and at closure;
- ensure the rehabilitated land surfaces are safe and stable; and

- undertaken rehabilitation tasks detailed in the MCP.

6. TEN CLEARING PRINCIPLES

The detailed assessment of the Ten Clearing Principles is presented in **Table 12**. The proposed clearing **may be at variance** with Principle (b) related to significant fauna habitat.

The proposed clearing was **unlikely to be at variance** with Principle (a) relating to biodiversity values and Principle (c) clearing of rare flora.

The proposed clearing was **not at variance** with remaining clearing principles related to TECs, remnant vegetation, watercourses or wetlands, land degradation, nearby conservation areas, surface and groundwater quality, and flooding incidence or intensity.

Table 12: Assessment against the Ten Clearing Principles

Clearing Principle	Assessment of variance to Clearing Principle	Outcome - Assessment of variance with clearing principle
Principle (a) *Native vegetation should not be cleared if it comprises a high level of biological diversity*	The Pilbara region is known to have very high biodiversity value, possessing high species richness and many endemic flora and fauna species. The native vegetation in the proposed Clearing Permit Area is considered to possess a moderate level of biological diversity due to the presence of conservation significant fauna and flora species and their habitats (Umwelt 2022). Therefore, the proposed clearing will be impacting the biological diversity in the area. The Project will result in clearing of up to 638.4 ha of native vegetation in a 'Good to Excellent' condition within the Pilbara bioregion with 9 of the 10 mapped vegetation types being impacted (Umwelt 2022a). Proposed clearing of native vegetation also impacts on two of the Beard (1975) vegetation associations. At a regional and subregional scale, the impact to the pre-European extent of these vegetation associations as a result of the Project is equivalent to, or less than, 0.06% and 0.01% of the Hamersley 18.11 and Hamersley 82.3 associations within the Pilbara bioregion, respectively (**Table 6**). Therefore, implementation of the Project will not result in a significant impact on the vegetation associations of the Pilbara bioregion. Of the nine significant flora taxa recorded, one Federally listed as Critically endangered, six being listed as DBCA priority flora and two being potentially undescribed recorded in the Flora and Vegetation Umwelt 2022 Survey Area, only two were located within the Clearing Footprint: • Four individuals of *Aristida lazaridis* (P2), and • 221 individuals of *Seringia exastia* (T) Rapallo (2022c) previously recorded 3 individuals of *Rhagodia sp. Hamersley* (M. Trudgen 17794) (P3*)* in the Indicative Clearing Footprint, however none were recorded more recently by Umwelt (2022a) (**Table 8**). The vegetation associations, fauna habitats and landform types present within the proposed Clearing Area, are well represented in surrounding area and are not considered restricted to the proposed Clearing Permit Area. Umwelt (2022b) assessed direct impacts and edge effects to all nine significant flora taxa and their preferred habitats as unlikely to be significant at both the local and regional scale, due to the low percentage of plants and habitat impacted, the range of populations and the common and widespread nature of their preferred habitats. Likewise, direct impacts to vegetation are assessed as unlikely to be significant at both the local and regional scale, due to the relatively low percentage of each vegetation type potentially impacted and the common and widespread nature of the vegetation system associations. The proposed Clearing Footprint is unlikely to represent an area of higher biodiversity than surrounding areas, in either a local or regional context.	The proposed clearing is **unlikely to be at variance** with this principle.
Principle (b) Native vegetation should not be cleared if it comprises the whole, or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	Two fauna species of significance were confirmed as occurring within the Clearing Permit Area based on the fauna detailed in-field surveys (Rapallo 2012a;2021b) within the Terrestrial Fauna Survey Area. These species comprise: • Western Pebble-mound Mouse (*Pseudomys chapmani*); and • Fork-tailed Swift (*Apus pacificus*). The Western Pebble-mound Mouse is listed as P4 under the BC Act. It is widespread in the broader region and has also been recorded numerous times at Mining Area C (Biologic 2017), situated approximately 15 km from the Clearing Permit Area (**Figure 1**). The Fork-tailed Swift is listed as Migratory under the BC Act and the EPBC Act. The species has been recorded within the broader Terrestrial Fauna Survey Area and it is likely to forage above the Clearing Permit Area during summer (Johnstone and Storr 1998). As the species is entirely aerial, the Project is not expected to impact the species. In addition to the two species of significance recorded from the detailed in-field surveys, another eight fauna species of significance are considered likely to occur within the Clearing Permit Area comprising the: • Ghost Bat (*Macroderma gigas*) – Vulnerable (BC Act and EPBC Act); • Northern Quoll (*Dasyurus hallucatus*) – Endangered (BC Act and EPBC Act); • Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) – Vulnerable (BC Act and EPBC Act); • Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable (BC Act and EPBC Act); • Gane's Blind Snake (*Anilios ganei*) – Priority 1 (BC Act); • Pilbara Barking Gecko (*Underwoodisaurus seorsus*) – Priority 2 (BC Act); • Grey Falcon (*Falco hypoleucos*) – Vulnerable (BC Act and EPBC Act); and • Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected (BC Act). Fauna habitats are not restricted to the Clearing Permit Area and all habitats recorded in the broader Terrestrial Fauna Survey Area extend beyond the Survey Area boundary. Suitable habitat for the Gane's Blind Snake, Pilbara Barking Gecko, Grey Falcon and Peregrine Falcon occur in the Clearing Permit Area however the habitat within the Proposed Clearing Area is not likely to be significant habitat or necessary for the maintenance of a significant habitat for these species. However, the Proposed Clearing Footprint is likely to significantly impact the habitat of four conservation significant species: • Northern Quoll (*Dasyurus hallucatus*): The Proposed Action will remove 44.2 ha of critical habitat and 125.6 ha of supporting habitat for Northern Quoll and will therefore have a significant impact on the species (as defined by DCCEEW). The removal of critical and supporting habitat for Northern Quoll is proposed to be offset via the EPBC approval. • Ghost Bat (*Macroderma gigas*): The Pilbara population of the Ghost Bat is considered an important population as it is genetically distinct and divergent (TSSC 2016). The Proposed Action will remove 624.4 ha of supporting habitat for Ghost Bat, which is considered to be a significant impact (as defined by DCCEEW) and is proposed to be offset via the EPBC approval.	The proposed clearing **is at variance** with this principle.

<table>
<tr><th>Clearing Principle</th><th>Assessment of variance to Clearing Principle</th><th>Outcome - Assessment of variance with clearing principle</th></tr>
<tr><td></td><td>

Pilbara Leaf-nosed Bat (Rhinonicteris aurantia): The Pilbara Leaf-nosed Bat population of the Pilbara and Gascoyne regions is considered an important population as it comprises multiple colonies that form one interbreeding population (TSSC 2016). The proposed Clearing Permit Area does not support critical habitat and they have not been observed in the area. It is considered unlikely the proposed Action will have a significant impact (as defined by DCCEEW).
Pilbara Olive Python (Liasis olivaceus barroni): No potential denning habitat is to be cleared by the proposed Clearing Permit Area. However, clearing of up to 118.7 ha of supporting habitat for Pilbara Olive Python is considered to be a significant impact (as defined by DCCEEW) and is proposed to be offset via the EPBC approval.

It is unlikely that important habitat for SRE's occurs within the Clearing Permit Area. No short-range endemic species were recorded within the proposed Clearing Permit Area. Despite 16 possible SRE taxa being recorded in the Clearing Permit Footprint (Appendix E), habitat connectivity across the landscape suggests that the potential SRE taxa found in these habitats are likely to have their distributions extending outside the Clearing Permit Footprint (Rapallo 2022a).
</td><td></td></tr>
<tr><td>Principle (c)
Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora</td><td>Seringia exastia, was recorded in the Clearing Footprint and broader Flora and Vegetation Survey Area. This species has been delisted under State legislation but is still listed under the EPBC Act as Critically Endangered; however, this is due to a taxonomic revision where a Threatened and a common species were merged, and the name of the former was adopted as the new name, with the conservation status still attached. The current distribution map incorporates this revision, showing Seringia exastia as widespread across northern Western Australia (Western Australian Herbarium 2022).</td><td>The proposed clearing is unlikely to be at variance with this principle.</td></tr>
<tr><td>Principle (d)
Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a Threatened Ecological Community</td><td>No PECs or TECs were identified within the Clearing Permit Footprint or the broader Flora and Vegetation Survey Area.
The nearest PEC to the Flora and Vegetation Survey Area is a subtype of the "Coolibah-lignum flats: Eucalyptus victrix over lignum community in the Pilbara". The edge of the PEC's buffer zone is located approximately 5 km south of the Flora and Vegetation Survey Area.
None of the vegetation types identified and described within the broader study area correspond with Commonwealth or State-listed TECs (Umwelt 2022b).</td><td>The proposed clearing is not at variance with this principle.</td></tr>
<tr><td>Principle (e)
Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared</td><td>At a regional and subregional scale, the impact to the pre-European extent of these vegetation associations as a result of the Project is equivalent to, or less than, 0.01% Therefore, implementation of the Project will not result in a significant impact on the vegetation associations of the Pilbara bioregion. Similarly, the regional impact of the Clearing Permit Area to soil-landscape units is unlikely to be significant (Umwelt 2022b).
<table>
<tr><th>Vegetation Association</th><th>Scale</th><th>Pre-European Extent (Ha)</th><th>Current Extent Remaining (Ha)</th><th>Pre-European Extent Remaining</th><th>Cons. Status</th><th>Extent In Clearing Permit Area (Ha)</th></tr>
<tr><td>Hamersley 18.11</td><td>State Wide</td><td>19,892,306</td><td>19,843,148</td><td>99.75%</td><td>Least Concern</td><td>588</td></tr>
<tr><td></td><td>Pilbara Bio-region</td><td>676,556</td><td>671,843</td><td>99.30%</td><td>Least Concern</td><td></td></tr>
<tr><td>Hamersley 82.3</td><td>State Wide</td><td>2,565,901</td><td>2,157,841</td><td>99.51%</td><td>Least Concern</td><td>272</td></tr>
<tr><td></td><td>Pilbara Bio-region</td><td>2,563,583</td><td>2,550,888</td><td>99.50%</td><td>Least Concern</td><td></td></tr>
</table>
Umwelt (2022b) identified that potential fragmentation impacts to significant flora through separation (or increasing existing separation) are likely to be negligible and not significant. The local impact of the Clearing Permit Area on all Vegetation Types is relatively low in terms of the percentage of impact, and not likely to be significant at the local scale. Considering that none of the Vegetation Types within the proposed Clearing Permit Area are significant, the potential regional impact is unlikely to be significant.</td><td>The proposed clearing is not at variance with this principle.</td></tr>
<tr><td>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</td><td>There are no permanent watercourses or wetlands within the area proposed to clear therefore there is no vegetation growing in association with a watercourse or wetland.
The main surface water feature in the broader region is Weeli Wolli Creek – Marillana Creek flows into Weeli Wolli Creek located more than 30 km to the east of the Clearing Permit Area. The Weeli Wolli spring is located upstream of the confluence of Weeli Wolli Creek with Marillana Creek. Weeli Wolli Creek is unlikely to be impacted by the proposed clearing.
The risk of clearing causing surface hydrology issues is considered low. The main surface water features in proximity to the Clearing Permit Area include:

Mine Creek – bisects the central western side of the proposed Clearing Permit Area from south to north. Mine Creek is an ephemeral creek and/or floodplain that likely only flows for a short duration following intense rainfall, is unlikely to support permanent or semi-permanent surface water pools and does not appear to support a substantial riparian vegetation community.
Marillana Creek – the confluence with Mine Creek is located approximately 7 km downstream of the proposed Clearing Permit Area and supports riparian vegetation and seasonal surface water pools in the Flat Rocks area (approximately 24 km downstream of the Clearing Permit Footprint). Marillana Creek is currently impacted by BHP and Rio Tinto mining operations. Marillana Creek is unlikely to be impacted by the proposed clearing.

Umwelt (2022b) stated there is a potential for indirect impacts via interruption of surface water flows (including sheet flow) or changes in water quality to the following areas, where they occur downstream:

The population of Corchorus sp. (potentially undescribed, and an assessed conservation significance rating of high;
Riparian vegetation;
Mulga grove vegetation (VT7);
Populations of significant flora in the GNH intersection area, downstream of interrupted sheet flows.

</td><td>The proposed clearing is not at variance with this principle.</td></tr>
</table>

Clearing Principle	Assessment of variance to Clearing Principle	Outcome - Assessment of variance with clearing principle
	• Any further significant taxa which have been assessed as 'possibly' occurring in the Study Area - Appendix A in Umwelt (2022b), which are dependent or partially dependent on surface water flows. Culverts and other drainage structures at creek crossings sufficient to minimise operational impacts will be installed with the design of drainage structures considering potential impacts to downstream flora and vegetation through interruption of surface water flow and the aim to re-establish both the volume and spread of water flows to avoid these potential impacts. Surface water flow diversion structures will be relatively small in size, any impacts on flooding potential from these diversion structures would be limited to within a few hundred metres of the Clearing Permit Footprint, and are not expected to impact surface water flow downstream. The discharge of excess water into the environment will only occur during significant rainfall events, with this water being managed to remove sediment and contaminants, prior to discharge. Negligible indirect impacts area anticipated from the proposed clearing, with mitigation proposed to manage surface water flow on-site and to maintain hydrological regimes in the broader region through implementation of a Surface Water Management Plan (SWMP).	
Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	Land degradation includes any alteration to land capabilities, soil erosion, salinity, nutrient export, acidification, waterlogging and flooding that affects the present or future use of land. Based on the characteristics of soil and subsoil within the proposed Clearing Permit Area it is unlikely that any of the proposed disturbances will increase the chances that the area would be subject to waterlogging, acidification, salinization, subsoil compaction and/or erosion (MBS Environmental 2021). Drainage through the proposed Clearing Permit Area is ephemeral, part of the area is characterised as a floodplain, there is an apparent lack of permanent or semi-permanented surface water, and a lack of broad incised channels. No groundwater-dependent vegetation was recorded within the Flora and Vegetation Survey Area (Rapallo 2022c). Clearing of native vegetation for the construction of the Project may alter the natural hydrological regime and influence native vegetation health, as well as downstream receptors. Construction largely associated with linear infrastructure, such as the haul road, is of particular note for this indirect impact. However, the Project has been designed to maintain surface water flow so that impacts due to alteration of surface flow are unlikely to occur. The risk to native vegetation as a result of the altered hydrological regime is considered to be **low**; therefore, there is not expected to be significant impacts to native vegetation as a result of Project implementation.	The proposed clearing is **not at variance** with this principle.
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	The proposed Clearing Permit Area does not contain any environmental features of significance. It is located within the Hamersley subregion which hosts the Karijini Gorges and a Wetland of National Significance, located within the Karijini National Park. Wetlands of subregional significance within the Hamersley subregion include Weeli Wolli Spring, Palm Spring, Duck Creek, Mount Bruce Coolibah claypan, and springs and surface water pools of the Robe River. The nearest of these features is Weeli Wolli Spring at approximately 31 km to the northeast, with most others being over 100 km away.	The proposed clearing is **not at variance** with this principle.
Principle (i) Native vegetation should not be cleared if the clearing is likely to cause deterioration in the quality of surface or underground water	Given the location of several surface water features within the Proposed Clearing Area, the clearing of vegetation has the potential to impact the quality of surface water, directly and indirectly. However, the proposed management measures are designed to control surface water runoff and sediment loads. Risks related to groundwater quality were considered negligible in the hydrogeological assessment (PSM 2021). Thus, the proposed clearing is unlikely to cause deterioration in the quality of surface water or groundwater.	The proposed clearing is **not at variance** with this principle.
Principle (j) Native vegetation should not be cleared if the clearing is likely to cause, or exacerbate, the incidence or intensity of flooding	The topography and major drainage features within the Proposed Clearing Footprint indicate a significant flood risk is possible. There are no permanent watercourses or wetlands within the area proposed to clear. However, suitable drainage features incorporated into site design would appropriately direct surface run-off and avoid any flooding in adjacent natural areas. The proposed clearing is therefore unlikely to cause or increase the frequency or intensity of flooding.	The proposed clearing is **not at variance** with this principle.

7. STAKEHOLDER CONSULTATION

MinRes recognises the value of building positive relationships with key stakeholders and the communities in which we are active. We seek to engage early, openly, honestly and regularly with the communities impacted by our operations and consider their views in our decision-making with respect to key planning, operational and closure aspects.

A wide variety of stakeholders have been identified within the proposed Clearing Permit Area and include:

- Pastoral Lease Holders
- Native Title Groups
- Other Mining Tenement Holders
- Other Stakeholders (surface rights)
- Statutory Authorities, Government, Business and Community Bodies

A summary of the subject and objectives for stakeholder engagement is included in **Table 13**. Obtaining advice from the following groups will be ongoing.

Table 13: Ongoing Stakeholder Engagement Summary

Stakeholder	Key Interests
Local Government Authorities	
Shire of East Pilbara	Community improvement, including local infrastructure, recreational facilities, health services, community care, building services, planning and development approval, cultural facilities etc.
State Government Agencies	
DMIRS	Mining activities, port operations and tenure (including approvals).
DWER	Environmental impacts including prescribed activities including approvals.
DBCA	Impact to surrounding ecological communities.
DPLH	Crown land, Reserves and Aboriginal heritage management.
DPIRD	Regional Development opportunities
EPA	Assessment of significant proposals under Environmental Protection Act 1986
MRWA	Intersections with haul road / bridges ensuring appropriate design.
Federal Government Agencies	
DCCEEW	Matters of National Environmental Significance (MNES), EPBC referrals
Indigenous Groups	
Banjima People Banjima Native Title Aboriginal Corporation (Prescribed Body	Consultation, management and protection of Aboriginal cultural heritage and involvement with activities on their country. Employment and contracting opportunities. Heritage agreement.

Stakeholder	Key Interests
Corporate for the Banjima People)	
Land Users	
Hamersley Iron Pty Ltd	Mineral activities - will want to ensure that our proposed activities do not interfere with theirs. May want the ability to seek relocation of the road if it impacts areas that are to be mined.
BHP Billiton Minerals Pty Ltd	Mineral activities - will want to ensure that our proposed activities do not interfere with theirs. May want the ability to seek relocation of the road if it impacts areas that are to be mined.
Hamersley iron – Yandi Pty Ltd	Mineral activities - will want to ensure that our proposed activities do not interfere with theirs. May want the ability to seek relocation of the road if it impacts areas that are to be mined.
FMG Pilbara Pty Ltd	Mineral activities - will want to ensure that our proposed activities do not interfere with theirs. May want the ability to seek relocation of the road if it impacts areas that are to be mined.
Pastoralists	
Juna Downs Pastoral Lease	Ensure proposed activities do not impact their pastoral interests.
Non-Government Organisations	
Bird Life Western Australia	Environmental Impacts in relation to birds associated with the Project.
Conservation Council of WA	Environmental Impacts and sustainability of the Project.
Wilderness Society	
Wildflower Society of WA	Protection and preservation of wildflowers and native flora.

8. OTHER PLANNING MATTERS, NATIVE TITLE, ABORIGINAL HERITAGE

The Project lies wholly within the Banjima People's Native Title determination (WCD2014/001, WAD6096/1998). Initially recognised by the Federal Court in 2014 and varied by appeal in 2015, this determination area encompasses more than 8,000 km² of the Central Pilbara region. The Banjima People were recognised as having a range of exclusive and non-exclusive Native Title rights across the determination area.

The Banjima Native Title Aboriginal Corporation (BNTAC) is the Prescribed Body Corporate holding native title rights and interests on trust for the Banjima People.

Engagement with Traditional Owners in relation to the Project commenced in 2012 through the heritage survey processes and the negotiation of a native title agreement that was concluded in 2017 (since expired). Extensive further engagement and consultation has been undertaken with BNTAC, nominated heritage professionals and the MinRes Heritage Environment Reference Committee (MHERC) in relation to the Proposal.

The Proponent has been engaged with BNTAC and the relevant Banjima People throughout the history of the Project and continues to work together to strengthen this relationship through regular meetings. Collaborative consultation with BNTAC, their appointed consultants, and the MHERC has addressed:

- Proposal overview and progress updates, including amendment of Proposal elements following feedback.
- Key referral and approvals documents.
- The Proponent's commitment to its relationship with the Banjima People.

Heritage surveys, identifying Aboriginal sites to be avoided and managed on ground

- Business and employment opportunities that may arise during project development.

The MHERC ensures that the Banjima People have a direct role in decision-making processes. Through these ongoing engagements, the Proponent has been able to identify key Social Surrounds values that may exist within the disturbance envelope, such as general amenity and water availability. These values, important to the Banjima People and the cultural landscape, have been thoroughly examined to determine if and how they could be affected by the proposed Project. With guidance from the Banjima People, the Proponent has worked to develop strategies that aim to avoid, minimise, or offset any potential negative impacts on these values.

Together, the Proponent and the MHERC have carefully evaluated the potential consequences of the proposal on significant heritage values, ensuring that all relevant cultural, environmental, and social aspects are considered. This collaborative approach not only facilitates better-informed decision-making but also reflects a commitment to preserving the heritage and well-being of the Banjima People throughout the life of the Project.

As a result of the detailed engagement and consultation, in November 2024 BNTAC provided MinRes with a letter of support for the Lamb Creek Project. The letter acknowledges that MinRes has conducted thorough engagement with the Banjima People regarding the proposal and made adjustments to the Projects design and management plans based on feedback from the MHERC. As a result, both BNTAC and the MHERC are satisfied with the level of consultation so far and have expressed their support for the proposal, contingent upon certain conditions outlined in the letter. These conditions include, among others: no on-site landfills, pit backfilled to minimum of 5 m above the pre-mining water table, no permanent ex-pit storage of mineralised waste, various amendments which have been made to Proposal elements to minimise impacts to visual amenity and access road to be paved with asphalt to reduce impacts from dust.

The Proponent confirms that extensive heritage investigations have been conducted across the full extent of the area subject to this approval. The surveys have been done in close collaboration with the Banjima People and there nominated heritage professionals to ensure that all significant cultural and heritage values are identified and properly addressed and managed during construction and operations. Through this work, 28 heritage places were identified within, and adjacent to, the Proposal Area. A number of the sites recorded have been lodged (not registered) under the *Aboriginal Heritage Act 1972*. No registered sites recorded in the Aboriginal Cultural Heritage Inquiry System (AHIS) (DPLH 2018) under the *Aboriginal Heritage Act 1972* occur within the Indicative Footprint or Development Envelope.

The most significant site identified during heritage investigations is a large ethnographic site, known by the Banjima People as Gaguna. The 27 other places are archaeological in nature and consist of artefact scatters and scarred trees. **The Proposal's Indicative Footprint and Development Envelope avoid Gaguna and the 27 other identified heritage places to ensure that their cultural values are protected**. Due to the sensitive and confidential nature of the cultural significance of this place, no further details are provided in this NVCP submission.

MinRes confirms that no AHA (1972) approvals are required to support the activities undertaken, which are subject to the approval of the NVCP.

9. SUMMARY AND CONCLUSIONS

The proposed clearing **is at variance** with Principle (b) related to significant fauna habitat and the entire clearing footprint (638.4 ha) is proposed to be offset via the EPBC approval.

The proposed clearing was **unlikely to be at variance** with Principle (a) relating to biodiversity values and Principle (c) clearing of rare flora.

The proposed clearing was **not at variance** with remaining clearing principles related to TECs, remnant vegetation, watercourses or wetlands, land degradation, nearby conservation areas, surface and groundwater quality, and flooding incidence or intensity (Principles d, e, f, g, h, I, and j).

Impacts from the Project are expected to be negligible and will not result in any significant or long term impacts on key environmental factors within the proposed Clearing Permit Area or adjacent areas. Vegetation types and terrestrial fauna habitats are typically widespread, and significant flora and fauna species all occur outside of the proposed Clearing Permit Area.

The environmental impacts associated with the Project can be effectively managed by applying the EPA's mitigation hierarchy (avoid, minimise, rehabilitate, offset) for the Project.

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APPENDIX A
DATABASE SEARCH RESULTS

APPENDIX B
SUMMARY OF FLORA AND VEGETATION SURVEYS

Table B.1: Summary of Flora and Vegetation Studies and Surveys

Studies And Surveys	Area	Scope And Timing	Survey / Study Effort	Consistency With Guidance and Limitations
Lamb Creek Detailed and Targeted Flora and Vegetation Survey (Umwelt 2023)	3785.7 ha	The 2022 field survey was conducted within the most appropriate time to survey in the Pilbara Region (approximately six to eight weeks post wet season – March to June). Above-average precipitation was received during the wet-post wet season 2021/2022, with significant above-average precipitation received in February and May 2022. This significant rainfall in May 2022 combined with reasonably warm temperatures allowed for further follow-up targeted survey in late June-July 2022. The 2022 survey was conducted mid-to end of season and the flowering season was considered to be good, with a relatively high proportion of annual and ephemeral vascular taxa recorded and many perennial taxa in flower. All perennial taxa were at least in good condition.	Detailed survey was undertaken encompassing the entire Study Area. At least three quadrats were established in each vegetation pattern identified through initial aerial photography interpretation and on-ground field survey in the Study Area. Re-score of an appropriate sample of existing quadrats (Rapallo 2021a) was undertaken during the survey. Mapping of VT boundaries was undertaken using a combination of aerial photography (scale 1:10,000) and information collected during traverses between quadrats and relevés. Field verification of VT boundaries post-analysis was not undertaken. Targeted survey was undertaken using transects spaced approximately 50m apart, with finer scale transects employed where significant flora taxa were identified. Opportunistic targeted survey for significant flora taxa was also undertaken while traversing the Study Area to establish quadrats and relevés during the 2022 survey. Detailed and Targeted Survey was conducted over a total of 90 person days in 2022. No constraints prevented appropriate sampling techniques (quadrat/relevé establishment, foot transects) being employed. Access within the Study Area enabled detailed VT and condition mapping to be undertaken throughout the Study Area via foot, vehicle and helicopter. Mapping and data reliability is therefore considered to be relatively high.	The survey and reporting works comply with the following documents: • Environmental Factor Guideline – Flora and Vegetation (Environmental Protection Authority 2016a) • *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority 2016b)
Detailed flora and vegetation survey of the Great Northern Highway intersection – Lamb Creek Project (Rapallo 2021a)	254 ha	Detailed flora and vegetation survey of the Great Northern Highway intersection. The survey period of 12-17 May 2021 aligned with the recommended timing for vegetation surveys in the Eremaean Botanical Province and occurred within the primary survey period	A total of 19 flora quadrats (50 m by 50 m) and 1 relevé were sampled during the field survey. Additional flora taxa were recorded opportunistically while traversing between quadrats. Survey also included: • opportunistic records and field notes; • specimen collection and identification; and	The flora survey was conducted in accordance with Environmental Protection Authority (2016b) and conformed to requirements for a single-season detailed flora survey.

Studies And Surveys	Area	Scope And Timing	Survey / Study Effort	Consistency With Guidance and Limitations
		(Environmental Protection Authority 2016b).	• vegetation health classification.	
Targeted conservation significant flora survey of the Lamb Creek project area (Rapallo 2022c)	3,000 ha	A targeted significant flora survey was conducted over two phases: • Phase one: 15-29 April 2020, including the proposed mine site within R47/19 (271 ha), the haul road corridor (L47/736; 388 ha) and the Great Northern Highway intersection (57 ha). • Phase two: 12-17 May 2021, includes the targeted survey area at the Great Northern Highway intersection (156 ha).	Survey comprised: • a flora desktop assessment; • systematic parallel traverses spaced approximately 50 m apart; and • additional searches on foot and via helicopter, outside the survey area.	Survey undertaken in April 2020 and May 2021, which is within the appropriate time to survey for flora and vegetation in the Pilbara bioregion, in accordance with Environmental Protection Authority (2016b) and was undertaken by suitably experienced botanists. Key limitations included: • The interrogation area / methodology used for the desktop searches could have been more appropriate for the shape of the survey area. • A number of essential sources stipulated by guidance requirements were not reviewed prior to the survey as part of the desktop assessment. There is no clear summary of the review of previous local flora and vegetation surveys to indicate whether any significant flora taxa have been previously recorded in the vicinity of the survey area. • The full extent of significant flora populations outside the survey area were not surveyed; however, information from studies for other projects in the

Studies And Surveys	Area	Scope And Timing	Survey / Study Effort	Consistency With Guidance and Limitations
				region are available.
Lamb Creek and Wedge Deposits – Flora and Vegetation Desktop Assessment	3,110 ha	Desktop Assessment within a 40 km buffer of the defined Study Area to identify potential flora and vegetation factors that may occur within the Study Area and require surveys as part of the environmental approval process for the project.	Desktop Assessment to gather contextual information on the Study Area from existing surveys, literature, database searched and spatial information.	The Desktop Assessment addresses and/or complies with the following documents: • *Environmental Factor Guideline – Flora and Vegetation* (Environmental Protection Authority 2016a); • *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority 2016b); and • *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (Department of the Environment 2013). Key limitations include: • A number of surveys used in the desktop assessment (including Rapallo 2012) have been undertaken over five years ago, they were not subject to as stringent guidelines as are currently required under the EPA Technical Guidance (Environmental Protection Authority 2016b).
Lamb Creek flora mapping update and data review	233 ha (215 ha of L47/736 outside of the	An extension to the 2012 vegetation mapping to account for a change in alignment	This desktop report comprised: extrapolation of vegetation mapping into the new haul road corridor;	As this was an amendment to the 2012 mapping data, this update was in line with Environmental

Studies And Surveys	Area	Scope And Timing	Survey / Study Effort	Consistency With Guidance and Limitations
(Rapallo 2017)	previous area mapped in 2012)	of one of the proposed haul road options.	• a review of the 2012 flora survey data; • No field work was conducted within the portion of the new haul road located outside the area surveyed in 2012 • 2012 observations and drawings were utilised.	Protection Authority (2016b).
Level 2 Flora and Vegetation Survey of Lamb Creek project area for Process Minerals International (Rapallo 2012b)	2,068 ha	The flora and vegetation survey took place from 27 March to 1 April 2012 (6 days). Conducted at a suitable time for the Eremaean Botanical Province (Environmental Protection Authority 2016b). The survey encompassed the proposed mine site, two alternate haul road routes (nominal 120 m buffer either side), three alternate accommodation camp locations.	Desktop search and a single-phase level 2 comprehensive field survey. A total of 46 flora quadrats of 50 x 50 m were established within the area within each of the five land systems within the Flora and Vegetation Survey Area as well as opportunistic collections of species. The team comprised of three botanists. A total of 230 species, from 110 genera and 42 families, were recorded. Of those, 209 species were recorded within survey quadrats, and 21 species were recorded opportunistically.	The flora and vegetation survey was designed according to *Guidance Statement No. 51: Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (Environmental Protection Authority 2004) which has since been superseded by *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority 2016b)*; therefore, the field survey may not have met the existing requirements. There were very few access tracks, and all sites were accessed by helicopter.

APPENDIX C
FLORA AND VEGETATION SURVEY REPORTS

APPENDIX D
TERRESTRIAL FAUNA SURVEY REPORTS

APPENDIX E
TAXA WITH THE POTENTIAL TO BE AN SRE INVERTEBRATE RECORDED IN THE CLEARING PERMIT AREA

Table E.1: Taxa with the Potential to be an SRE Invertebrate Recorded in the Clearing Permit Area and Surrounds

Scientific Name	Literature Sources		SRE Status	Recorded in the Survey Area	Recorded in the Clearing Permit Area	Records in Survey Area	Records in Clearing Permit Area	Records in Indicative Footprint	Regional Records	Habitat
	Rapallo-2012	Rapallo-2022b								
Centipede										
Cryptops 'LCr01'	-	✓	Possible	✓	-					Gully/gorge
Cryptops 'LCr02'	-	✓	Possible	✓	✓	1	1	1	No	Stony plain
Mecistocephalus 'LCr01'	-	✓	Possible	✓	✓	6	6	6	No	Mulga, stony plain
Mecistocephalus 'LCr02'	-	✓	Possible	✓	-					Tussock grassland
Orphnaeus 'LCr01'	-	✓	Possible	✓	✓	1	1	1	No	Medium drainage
Sepedonophilus 'LCr01'	-	✓	Possible	✓	-					Gully/gorge
Gastropod										
Bothriembryon 'BOT065'	-	✓	Possible	✓	✓	4	4	4	Yes – unpublished WAM MSU data	Mulga
Isopod										
Buddelundia '10ma'	-	✓	Possible	✓	✓	3	3	3	Yes – 53 km northeast the Development Envelope (Alacran 2021c)	Stony plain
Buddelundia '13'	✓	✓	Possible	✓	✓	10	2	2	No – WAM database records of *Buddelundia* '13' available; however no sequenced data publicly available or via WAM MSU	Hillcrest/hillslope, medium drainage, Mulga
Buddelundia '16'	-	✓	Possible	✓	-					Deep gully
Buddelundiinae (Armadillidae) 'ISOP009'	-	✓	Possible	✓	✓	1	1	1	Yes – 124 km northwest (Wilson & Harvey 2021) and northeast of the Development Envelope (Alacran 2021c)	Medium drainage
Millipede										
Austrostrophus 'Clade A'	-	✓	Possible	✓	✓	2	1	1	Yes – undisclosed sampling location accessed via GenBank	Mulga, gully/gorge
Austrostrophus 'Clade M'	-	✓	Possible	✓	✓	3	3	3	No	Mulga, stony plain
Mygalomorph spider										
Kwonkan 'MYG324'	-	✓	Possible	✓	✓	1	1	1	Yes – records from Karijini National Park and Juna Downs Station (Wilson & Harvey 2021)	Mulga
Pseudoscorpion										

Scientific Name	Literature Sources		SRE Status	Recorded in the Survey Area	Recorded in the Clearing Permit Area	Records in Survey Area	Records in Clearing Permit Area	Records in Indicative Footprint	Regional Records	Habitat
	Rapallo-2012	Rapallo-2022b								
Austrochthonius 'LCr01'	-	✓	Possible	✓	-					Mulga
Euryolpium 'LCr01'	-	✓	Possible	✓						Gully/gorge
Indolpium 'LCr03'	-	✓	Possible	✓	✓	2	2	2	No	Hillcrest/hillslope
Indolpium 'LCr04'	-	✓	Possible	✓	✓					Gully/gorge
Indolpium 'LCr05'	-	✓	Possible	✓	✓	1	1	1	No	Minor drainage
Olpiidae 'LCr02'	-	✓	Possible	✓	✓	3	3	3	Yes – two WAM lodged specimens collected approximately 7 km north of this specimen (Wilson & Harvey 2021)	Hillcrest/hillslope
Scorpion										
Lychas 'bituberculatus complex'	-	✓	Possible	✓	✓	6	6	5	Yes – record from approx. 30 km south-southeast of the Proposal (Alacran reference sequence)	Mulga, stony plain
Lychas 'hairy tail complex'	-	✓	Possible	✓	-					Gully/gorge
Lychas 'harveyi complex'	-	✓	Possible	✓	✓	15	12	11	No – matches with sequenced specimen as *Lychas 'harveyi* complex' was not sequenced (previously believed to be widespread) as *Lychas 'harveyi* complex' was collected during the 2012 fauna survey. Nearest regional specimen of *Lychas 'harveyi* complex' is from Mining Area C.	Mulga shrubland patches, medium drainage, stony plain, tussock grassland plain
Lychas 'multipunctatus complex'	-	✓	Possible	✓	-					Tussock grassland plain
Urodacus sp. indet.	✓	-	Possible	✓	-					Flat

MINERAL RESOURCES

APPENDIX F
FLORA AND VEGETATION MANAGEMENT PLAN

APPENDIX G
SIGNIFICANT FAUNA MANAGEMENT PLAN

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