Widgie Gold Pty Ltd

ABN: 70638864187

Clearing Permit Application Supporting Document

MUNDA GOLD PROJECT

M15/87, L15/414

EGS Name: Munda Environmental Group
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COMMODITY	Gold	
PROJECT DESCRIPTION	The Munda Project is a pit cut back operation located 4.5 km west of Widgiemooltha and 82km south of Kalgoorlie-Boulder within the Shire of Coolgardie. The tenure includes M15/87 and L15/414 which is held by Widgie Gold Pty Ltd, a 100% owned subsidiary of Auric Mining Limited. The Munda tenure has been the subject of historic, and more recently, modern mining activity with a trial pit mined by Resolute Ltd in 1999. The Project is located within Unallocated Crown Land to the west of the hamlet of Widgemooltha and has been extensively disturbed by mining activities for over 100 years. The Munda Project has remained on care and maintenance since 2000. The Munda Mine Plan involves the recommencement of mining via an open pit cut back method. Ore will be trucked via the unsealed Mt Edwards Haul Road to the Coolgardie Esperance Hwy to the Greenfields Mill in Coolgardie. The current LOM is 5 years, although the surrounding areas are highly prospective and representative sound exploration potential. New infrastructure proposed that will require clearing of native vegetation includes, extension of the existing waste rock landform to the north, pit cutback, development of a ROM Pad extension of internal mine roads and support infrastructure for the mining operations. Sustainability opportunities arising from the proposed mining and vegetation clearing activities include remedial works associated with historic mine areas, works associated with site drainage and utilization of any excess cleared vegetation material as a growth medium.	
THIS CLEARING PERMIT (PURPOSE) APPLICATION	This Application for a Clearing Purpose Permit is submitted for the proposed clearing of up to 115ha on M15/87 and 5ha on L15/414 covering a Pit Cutback, WRL construction, minesite infrastructure expansion and roadworks. A combined Project clearing total of up to 120.0ha (including buffers) using mechanical methods will take place progressively over 5 years as the Project is developed.	
RELEVANT TENEMENTS	Munda Gold Project – M15/87 & L15/414	
DISTRIBUTION	Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) Native Vegetation Assessment Branch – Auric Mining Ltd - Digital Copy.	
AUTHORIZED FOR SUBMISSION	John Utley Technical Director Date: 18 November 2024	

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1. INTRODUCTION

1.1 Background to Project

The Munda Project forms part of the Auric Mining Limited broader Widgiemooltha Gold Project and is located 4.5km west of the small hamlet of Widgiemooltha in the Coolgardie Mineral Field. The Project tenure is held by Widgie Gold Pty Ltd, a 100% owned subsidiary of Auric Mining Limited and is accessed via the Coolgardie Esperance Highway and the unsealed Mt Edwards Nickel Mine Haul Road. The mine development is located within the Shire of Coolgardie.

While the Widgiemooltha area has a long gold mining history dating back over 100 years, recent modern pit mining on tenure commenced with the excavation of the Munda Pit in 1999 by Resolute Limited under Notice of Intent Reg Id 3104. Resolute did not achieve the expected gold or nickel returns and the mining ceased in 2000, the site disturbance was rehabilitated and the Project placed on Care and Maintenance.

The current Mine Plan involves the recommencement of mining, via open pit cut back methods of sections of the Munda Pit, establishment of limited support mining infrastructure and the construction of a short section of unsealed Haul Road to link with the existing Mt Edwards Haulroad that terminates at the Goldfield Esperance Highway.

Mining is scheduled to commence in March 2025.

Current Status

The Munda Gold Project is a brownfields operation on Managed Care and Maintenance (MCM) while feasibility studies and permitting to recommence mining are finalized. The minesite is located on granted mining tenure in good standing on Unallocated Crown Land.

There are currently no Clearing Permits in force for the mine site, which has been extensively disturbed by past activities associated with timber cutting, exploration and mining. Following the addition of economic gold reserves to the Munda Resource Base through an extensive drill programme, the revised Mine Plan has indicated clearing is required on M15/87 and L15/414 for expansion of mining operations, construction of a WRL, ROM pad, establishment of a haul road and support infrastructure.

Biophysical surveys to support the Clearing Permit application were undertaken in 2021 and 2024 and reports are referenced in Appendix A. A summary of current permitting and site approvals is shown in Table 1.

The Munda Gold Project location in respect to topography, access and regional infrastructure is shown on Figure 1 and the Munday study area surveyed for this Purpose Clearing Application is shown on Figure 2.

Third party authorisation is not required. The Munda Gold Project lies within M15/87 and L15/414, tenure which is beneficially owned by Widgie Gold Pty Ltd, a wholly owned subsidiary of Auric Mining Limited.

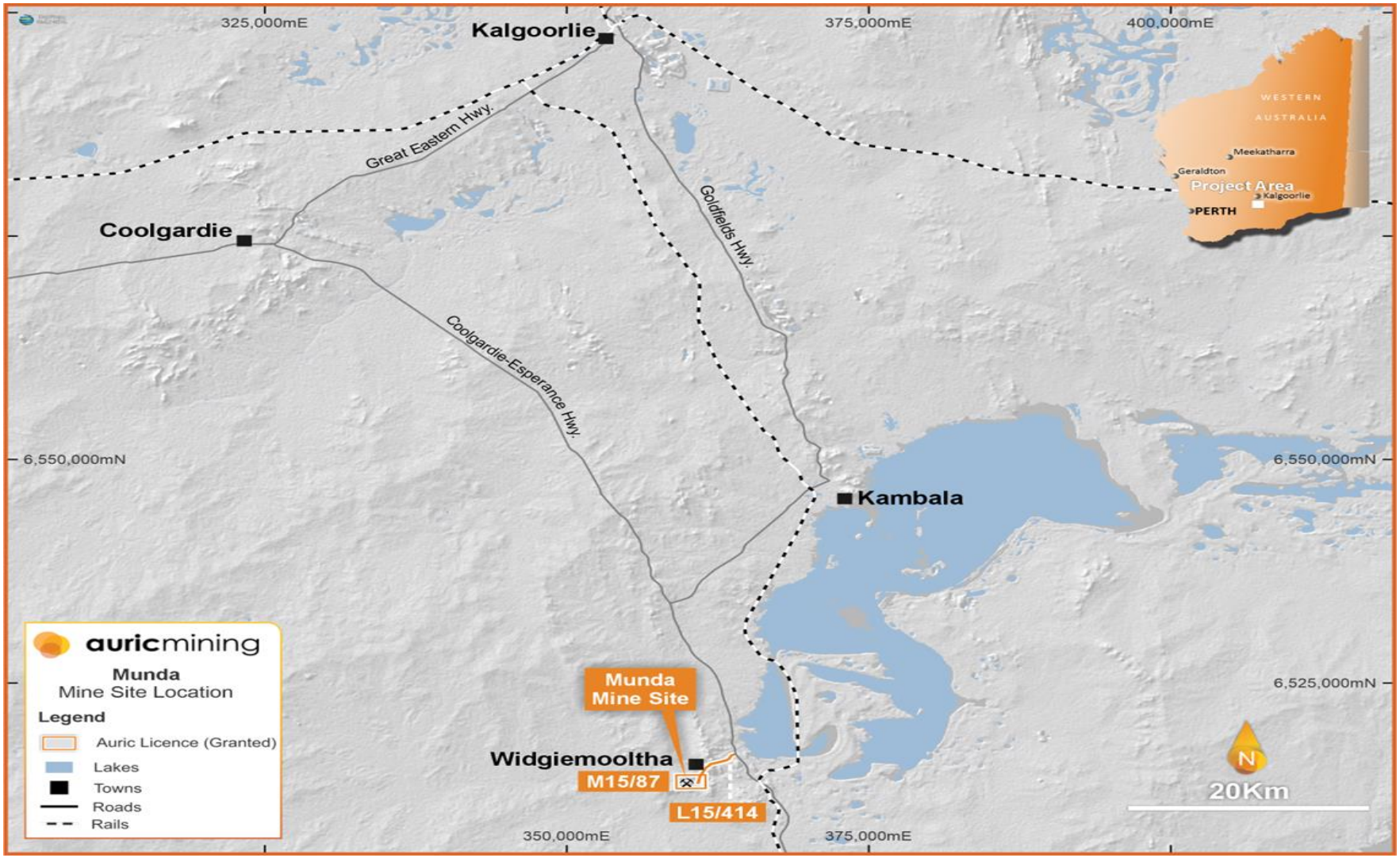

Figure 1: Munda Gold Project - Regional Location, Infrastructure and Topography

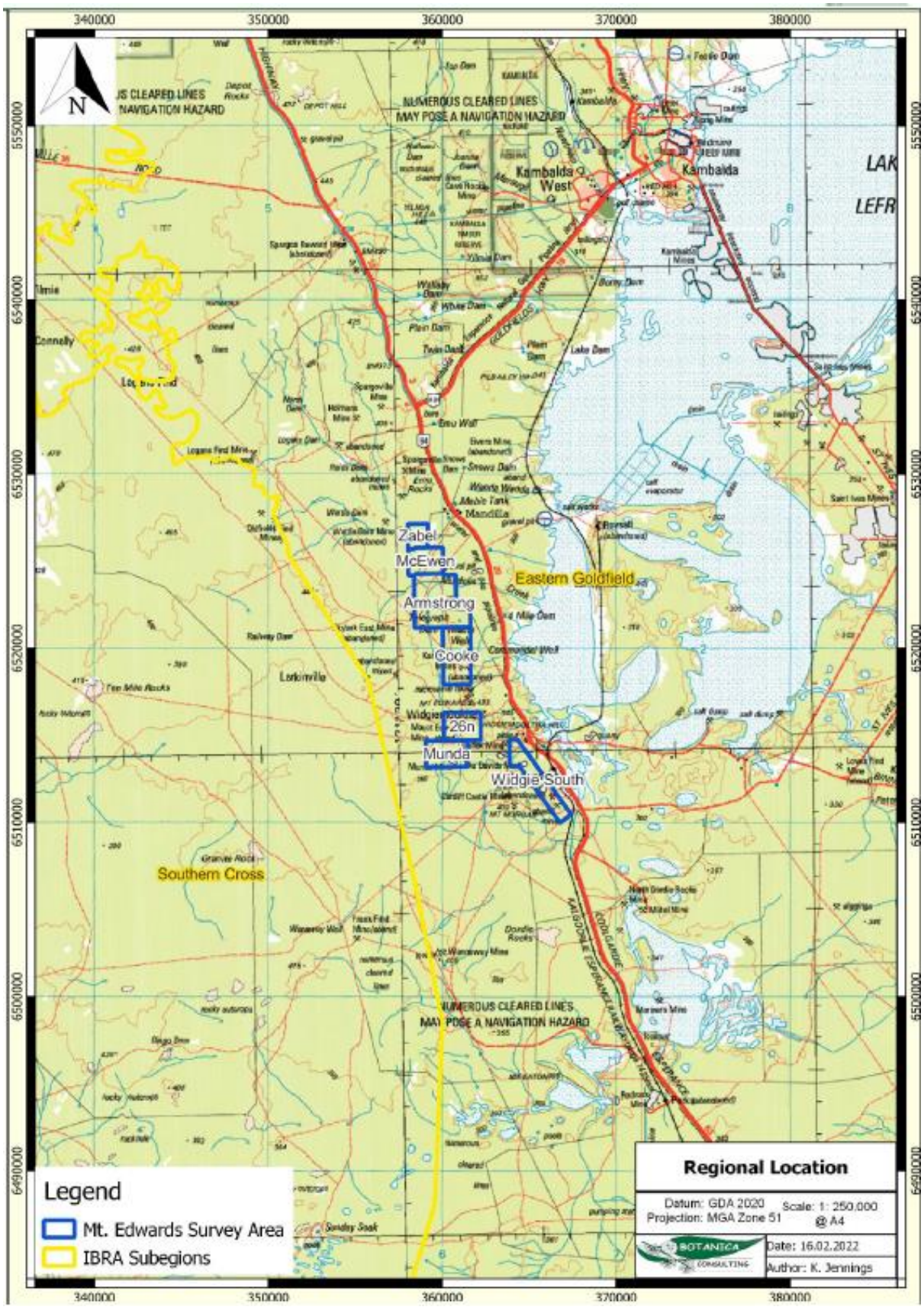

Figure 2: Munda Gold Project Regional Access, Drainage and Baseline Survey Area

Table 1: Summary of Project Permitting and Approvals

Approval Required	By Whom	Current Status
Mining Tenure	DEMIRS	Tenement Conditions associated with M15/87 and L15/414. Tenements are owned by Widgie Gold Pty Ltd, a wholly owned subsidiary of Auric Mining Limited, and are in good standing.
Development Approvals	DEMIRS	The Mining Proposal Amendment for this project is in preparation and is scheduled to be submitted in December 2024
Impact on Threatened Species	DBCA	No threatened flora or fauna species, Threatened or Priority Ecological Communities were recorded in the site survey area (Botanica, 2021).
Heritage	DPLH	No Registered or Other Heritage Place Aboriginal sites are recorded on the AHIS Database for the Munda tenure. No Registered heritage sites were identified during the recent heritage survey (Terra Rosa, 2024). No sites of heritage significance were reported following archaeological and ethnographic surveys undertaken in 1996 by *Anthropos Australis* and John Gleason (1998). A search of the WA Heritage Council inHerit Database (2024) and the Shire of Coolgardie Municipal Inventory (2012) did not identify any record of heritage associated with the Munda mine site or proposed haulroad.
Clearing Permit (Purpose)	DEMIRS	The Munda Gold Project and near mine surrounds are extensively disturbed and degraded by past mining activities. This Clearing Application for a purpose permit applies to M15/87 and L15/414 for minesite development,and construction of support infrastructure.
Pit Dewatering	DWER	There are no stored pit waters within the current Resolute Pit. Pit groundwater inflows during the proposed pit cutback are expected to be minimal and recovered waters will be directed to inpit sumps and will be fully utilized for dust suppression.
Groundwater Well Licence	DWER	A 5C groundwater licence is expected to be required for the Munda Pit operations as saline water for dust suppression will be utilised nearby pits. A GWL application has been completed Ref No 068087-GWL.
Local Authority Approvals	SOC	Not required.

2. THIS PROPOSAL

This application for a Clearing Permit (Purpose) within M15/87 and L15/414 seeks approval for the removal of native vegetation covering up to 120ha from the 405.67ha Munda Investigation Area shown on Figure 2. The vegetation mapping for proposed disturbances was completed from desktop and field surveys conducted by Botanica Consulting in November 2021. The proposed clearing area disturbance is temporary, as rehabilitation will be undertaken progressively, or at the completion of the 5-year Life of Mine (LOM) on all areas except the mining void. Details of the tenure area, survey area and proposed Application Area are shown in Table 2.

Table 2: Munda Gold Project – Extent of Proposed Clearing

Tenure	Tenure Area (ha)	Investigation Area (ha)	Application Area (ha)
M15/87	364.05	364.05	130
L15/414	41.62	41.62	5
Total	405.67	405.67	135

This programme will result in the clearing of vegetation by mechanical means, with recovered vegetation tracked rolled and stockpiled for later rehabilitation use at the completion of the Project. Topsoil and root stock will be recovered and managed in accordance with Auric's Management Procedures. Clearing, if approved, is scheduled to commence in February 2025, with staged clearing undertaken as required, and spread over 5 years.

2.1 Location and Ownership

The proposed clearing is located in the Coolgardie Mineral Field - 15 on granted M15/87 and L15/414 within the Shire of Coolgardie on Unallocated Crown Land. The mining tenure is owned by Widgie Gold Pty Ltd, a wholly owned subsidiary of Auric Mining Limited. Widgie Gold Pty Ltd is the Proponent for this Application.

2.2 Proposal Description

The current Mine Planning Schedule consists of the initial mining of the oxide and fresh rock gold resource at the Munda Gold mine complex by open pit methods. The ore will be stockpiled on a mine ROM Pad then transported for offsite processing via the new Munda Haulroad and the existing unsealed Mt Edwards Haul Road to the Coolgardie - Esperance Hwy, then north by road trains for processing at the Coolgardie Greenfields Mill.

The mine and the proposed clearing is not located wholly or partially in a gazetted occupied Township, Environmentally Sensitive Area (ESA), Schedule 1 Area, Threatened Ecological Community (TEC), or on a Pre-1978 State Agreement Act Area, Pre-1899 Crown Grant Areas, Biodiversity Reserve, World Heritage Property, Soil Reference Site, Red Book Area, Bush Forever Site; or registered Heritage Site. This site does not contain or potentially impact on significant lakes or wetlands, Water Supply Catchment areas, Water Reserve or Public Drinking Water Source Areas (WQPN 25).

Existing mining disturbance, current tenure, and the Clearing Application Area (with included buffers) is shown on Figure 3.

Figure 3: Munda Gold Project Clearing Application Area with Buffer.

3. EXISTING ENVIRONMENT

The Munda deposit, lies within the Eastern Goldfields Province of the Yilgarn Craton (Morris 1993) which comprises linear to arcuate north-west trending belts of greenstones intruded by granitoid rocks of Archaean age.

The climate and ecology of the area is characteristic of a transitional zone between the arid rangelands to the east and the wheatbelt/agricultural land to the west. The landforms of the Munda Prospect and associated infrastructure comprise regionally north south trending low hills with short secondary west, north and south flowing ephemeral drainage lines that ultimately change direction and flow east into the Lake Lefroy Salina bottomlands. These drainage lines traverse terrain units of the Graves, Moriarty, Gumland and Red Hill Land Systems (Payne et al, 1998).

Topographic elevations in the mine tenure range from 360m to 400m above sea level. The terrain is classified as being low relief with erosional escarpments merging with low stony rises of more resistant rocks, bordering areas of laterite and sand plain with playas and or salinas in the bottom lands. The minesite is one of several gold mines located in these granite-greenstone terrains most of which are located on low stony rises which form on or below catchment divides and carry sheet wash areas and drainage lines with eucalypts woodlands over chenopods.

According to the Interim Biogeographic Regionalisation of Australia (IBRA), the Munda Gold Project is located in the Coolgardie Bioregion (COO 03 - Eastern Goldfields sub-region). (Thackway and Cresswell 2017, DCCEEW 2024). The vegetation is described as mallee, Acacia thickets and shrub-heaths growing on red brown soils and sandplain, with dwarf shrublands of samphire adjacent to salt lakes, and surrounded by Eucalyptus woodlands.

3.1 Climate

The town of Norseman, located 84km to the south of the Munda Minesite, is recorded as an arid to semi-arid environment. The climate of the Project area is characterised by hot dry summers and mild winters. Maximum temperature peaks (>30^{o}C) occur between December and February. Dry weather occurs for approximately 9 to 11 months of the year, summers are hot and dry, and winters are mild and wet with unpredictable rainfall. The annual average rainfall for the Norseman Region is 288 mm and north east at Woolibar (near Kambalda) is 255mm (Rockwater 2024). Annual dam evaporation at Norseman exceeds rainfall in all months of the year. Significant rainfall events from degenerating ex-tropical cyclones occur most commonly from January–March. The highest daily rainfall event recorded in a 24-hour period is 164mm. With the prevailing winds ranging east-south easterly, the air has a lengthy passage overland and therefore produces little rain. The presence of summer low pressure systems over the interior, commonly referred to as heat lows, produces intense hot, dry conditions (Pringle et. al 1998).

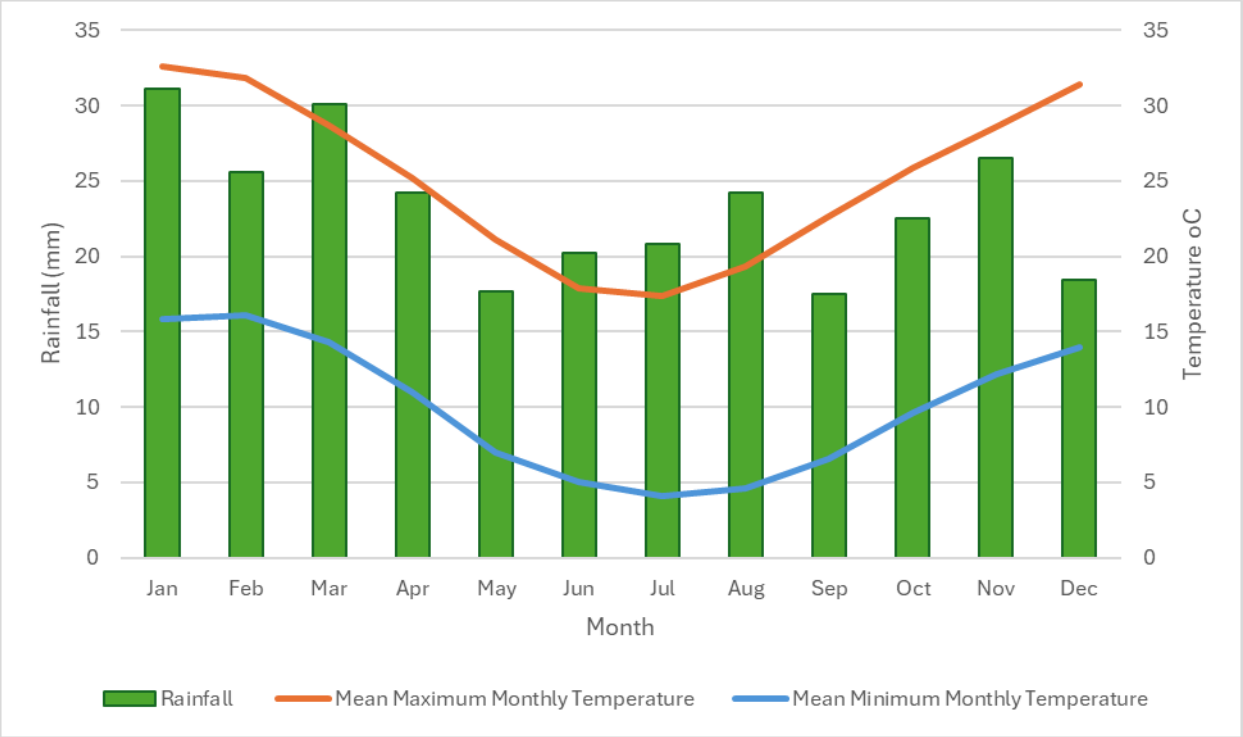

Figure 4: Mean Rainfall and Monthly Temperature for Norseman Aero Site 12009 (BoM 2024)

3.2 Land System and Soils

The regional landscapes in the Widgiemooltha district are generally undulating, with low relief and characterised by easterly drainage into saline playa lakes. These lowlands occupy broad alluvial valleys between erosional greenstone highs. The relief of outcrop areas is closely related to underlying geology with granitoids forming eroded pavements and domes, and basalts and metasedimentary rocks forming elongated, rounded hills and strike ridges.

Landforms in the mine areas are described using the Land Systems approach defined by Pringle et. al. (1994) with the proposed mining operations located primarily in the Graves Land System with minor haulroad infrastructure in the Red Hill Land System (Kambalda Zone) of the WA Department of Primary Industries and Regional Development (DPIRD19) (Figure 5).

Graves Land System

This Land System covers the majority of the Munda Gold Project area and haul road extension. It consists of low hills of basalt and greenstone stony rises that support Eucalyptus woodlands with an *Atriplex* sp. and *Marianna* sp. understory. The adjacent alluvial plains are reported to be susceptible to water erosion where the perennial shrub cover is substantially reduced due to overgrazing activities. No domestic stock grazing has been recorded for the mine development area.

Soils

Soils within this Land System consist of calcareous red earths, or duplex soils often with a ferruginous (buckshot) mantle.

Moriarty Land System

This Land System comprises the western section of the Munda Gold Project Study Area and consists of low rises to 20m relief, gently undulating lower aprons with pebble mantels and level to very gently inclined alluvial plains with poorly defined, sparse drainage patterns. Vegetation free areas are common, often contain a mantle of quartz or ironstone pebbles, that are subject to sheet flow (Pringle et. al. 1994).

Soils

Soils in the mine infrastructure areas are typically red earths on greenstone or sandy-surface saline duplex clays with calcrete peds. In some locations, shallow duplex soils have developed and are susceptible to erosion when the vegetation or stony cover is removed.

Red Hill Land System

This Land System covers the north eastern part of the mine tenure and includes part of the haul road to Mt Edwards. The Land System consists of rounded basalt hills and strike ridges supporting patchy eucalypts, and Acacia shrublands with non- halophytic low shrub layers. Stony mantles and locally dense vegetation means this system is not generally prone to erosion.

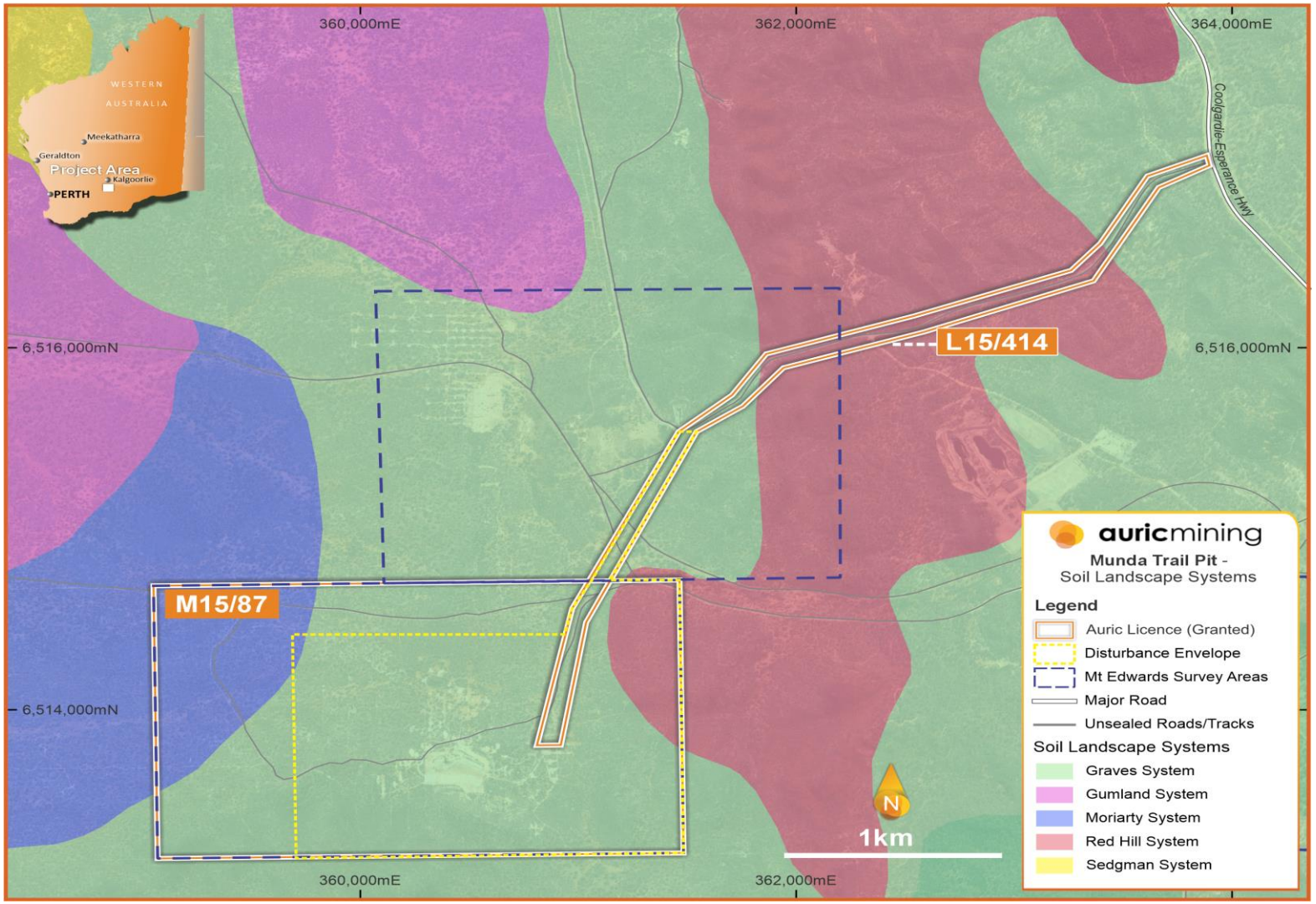

Figure 5: Munda Gold Project Survey Area Land System Mapping

3.3 Water Resources

Water resources in the Munda District can be described in terms of ephemeral surface waters associated with narrow drainage tracts and limited deeper groundwaters in fractured basement rock structural positions of varying quality and salinity. According to the Geoscience Australia database (2015), there are no permanent or ephemeral inland surface waters within the Munda survey area, with drainage limited to several low order, unnamed ephemeral drainage lines that flow after significant storm events.

Groundwater Dependent Ecosystems (GDE) includes biological assemblages of species such as wetlands or woodlands that use groundwater either opportunistically or as their primary water source. For the purposes of this report, a GDE is defined as any vegetation community that derives part of its water budget from groundwater and must be assumed to have some degree of groundwater dependency. In accordance with the BoM *Atlas of Groundwater Dependent Ecosystems* (BoM, 2024) database, there are two moderate-potential terrestrial GDEs within the broader Mt Edwards survey area, with none identified in the Munda Tenure.

3.3.1 Surface Water

The surface runoff and creek lines drain to the east, north and south-east via ephemeral streams and tributaries into large, low-lying flood plains with terminal salinas. Stream flow occurs only after heavy storms or after persistent low intensity rainfall. A surface water assessment of the mine site was completed in 2024 to identify flood risks associated with the proposed pit and future underground development (Rockwater 2024).

The planned Munda pit lies on or close to a drainage divide and there is limited potential for surface runoff to affect the proposed pit development (Rockwater 2024). The Munda Project site intersects one minor ephemeral drainage line with two small sub-catchments (designated A and B) from which flood flows are likely to be minimal – with Peak Flows being about 0.4 to 0.5 m3/s for the 1-in-100-year flood. The flows would also recede rapidly (Rockwater 2024) and pit infrastructure would be protected by flow diversions into adjoining catchments.

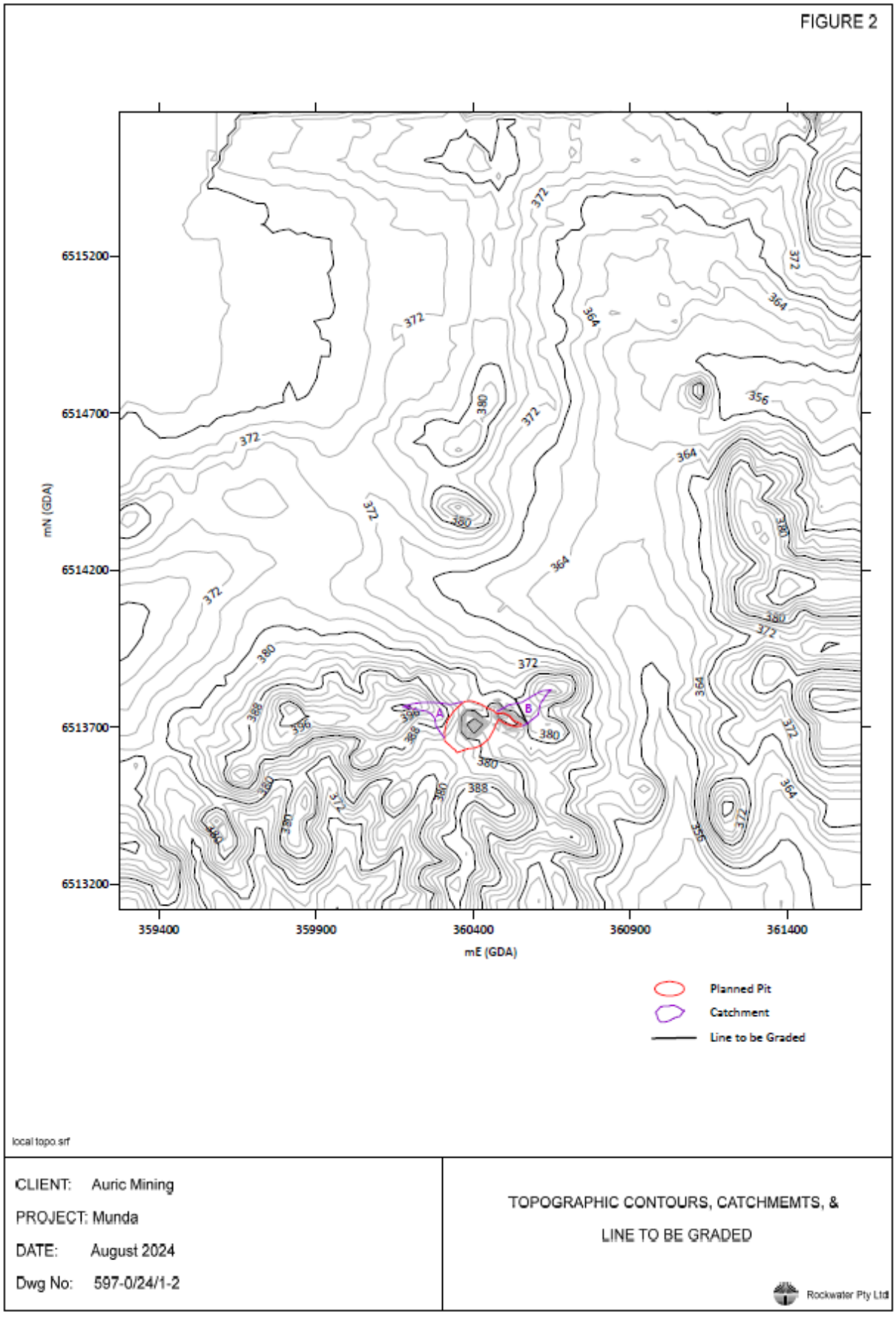

Figure 6: Surface Water Catchments for the Munda Project Area

3.3.2 Groundwater

The Project area lies within the Kalgoorlie Hydrogeological Series (SH51-9) 1:250,000 scale map sheet and is part of the Kalgoorlie Groundwater Proclamation Area (RIWI 1914). The major aquifers in the region are present in (a) palaeodrainage channels and (b) within low yielding fractured rock aquifers present in structural positions at the oxide - fresh rock interface and in fresh rock fractures. Waters are typically saline with TDS ranging from 14,000mg/L to 35,000mg/L. There are no water-level data (in the WIR database) that can be used to determine regional groundwater levels and flow patterns, although it is expected that directions of groundwater flow will generally follow the topography, with groundwater discharging to the Lake Lefroy Salt Lake system, lying to the east.

Historical mining records and recent hydrogeological data recorded during resource drilling programmes report there were no major paleo-channel aquifers encountered, with limited yield groundwater positions associated with fractured rock aquifers in the mine lithological contact environs at depths ranging from 27m to 60m (Rockwater 2024). Pit water inflows are predicted to be limited in volume initially due to the surrounding low permeability (Rockwater 2024). Water modelling for deeper section of the pit predict inflows could increase to up to 30Kl/day and will be recovered and fully utilized for dust suppression.

3.4 Dust and Erosion Impact Management

Land management assessments for the Red Hill, Moriarty and Graves Land Systems highlight that Narrow Drainage Tracts and Alluvial Plain terrain units are susceptible to water erosion where perennial shrub cover is substantially reduced (Pringle et. al. 1994), or the soil mantle surface is extensively disturbed. While both of these activities will occur as part of the proposed mine establishment, sound land care management practices can substantially reduce the risks of environmental harm and can remediate impacts to drainage that have occurred as a part of past activities.

The primary objective is to minimise soil erosion and dust generation and the export of material into ephemeral drainage lines and onto verge vegetation. The following strategies will be implemented to achieve the clearing and rehabilitation objectives:

- Identify areas of major erosion hazard and avoid re-disturbance of these areas wherever possible;
- Provide environmental supervision and co-ordination of work teams during clearing and topsoil recovery;
- Schedule vegetation clearing to match development need and seasonal timing;
- Minimise ground disturbance and restrict clearing to designated areas;
- Reinstate creek, any drainage line disturbance at the completion of any earthworks programme
- Schedule any ephemeral creek-crossing construction activities to coincide with no creek flow periods, where practicable;
- Return stripped topsoil and rootstock to the original horizon to promote rapid revegetation and surface stabilisation;

- Keep topsoil stockpiles out of inappropriate areas such as watercourses and areas subject to wetting by poorer quality waters;
- Control access and prevent vehicular movements over topsoil stockpiles;
- Rehabilitate progressively where required and re-spread cleared vegetation selectively to create habitats;
- Reform access roads to similar pre-construction surface conditions, and
- Install erosion control structures along roads and areas of high erosion risk.

The following strategies will be implemented to achieve dust minimisation:

- Minimise clearing and avoid unnecessary machinery movements,
- Rehabilitate and/or stabilise disturbed surfaces as soon as possible, and
- Damp down with water of suitable quality from water trucks as necessary.

Proposed management control arrangements during clearing will keep impacts to an acceptable level.

3.5 Biodiversity, Flora, Fauna and Ecosystems

The Munda Gold Project tenements lie within the Coolgardie IBRA bioregion in the Eastern Goldfields (COO3) subregion (Thackway and Creswell 2017, DCCEEW 2024). This IBRA subregion vegetation is described as mallee, *Acacia* thickets and shrub-heaths on sandplain, with dwarf shrublands of samphire adjacent to salt lakes, and surrounded by *Eucalyptus* woodlands.

3.5.1 Flora

Botannica Consulting completed a flora, vegetation and fauna survey of the Munda Gold Project in 2021 as part of the larger Mt Edwards Project Survey and coverage is shown in Figure 2. The study area reported a total of 115 native taxa from 63 genera across 32 families. The majority of taxa were recorded within Fabaceae (14), Chenopodiacea (14), Scrophulariaceae (13 taxa), Myrtaceae (13 taxa) families (Botanica, 2021). Four broad scale vegetation communities were described and mapped. With the most widespread community within the Munda Gold Project identified as CLP-EW1 – Eucalyptus woodland dominated by *Eucalyptus urna*, *E. lesouefii* and E. transcontinentalis woodland over *Melaleuca pauperiflora, Acacia hemiteles* and *Eremophila scoparia* shrubland over *Olearia muelleri* and mixed Maireana low shrubland.

No threatened species were recorded, however one Priority 1 flora species *Philotheca apiculate was* recorded in the southwest of the Munda tenement (M15/87) associated with the Red Hill- ECW Vegetation Community. This occurrence is within the Project Investigation Area, but outside the proposed development envelope. No priority flora was recorded in the mine development area. The condition of the land was considered good to very good which has resulted in a high number of species being identified within the field survey.

Eight introduced (exotic) taxa were recorded within the Mt Edwards survey area. Of these, none are Declared Plants species pursuant to Section 22 of the *Biosecurity and Agriculture Management Act (2007)* according to the Western Australian Department of Primary Industries and Regional Development website.

No Threatened Ecological Communities as defined by the DBCA and the *EPBC Act (1999)* were recorded within the Munda tenure survey area. No Priority Ecological Community as listed by the DBCA was recorded within the Munda survey area. Pedestrian searches by the Flora survey team, which included an Arid Ecologist with extensive malleefowl experience, did not locate any evidence of the bird's presence.

Current desktop and field survey evidence, suggests no floral habitat of regional significance will be permanently impacted by the proposed clearing activities.

Recommendations in respect to the management of weed spread, minimisation of disturbance to natural runoff flow patterns, and confirmation of taxa suitable for use in minesite rehabilitation trials, were identified in the recent field work and these will be incorporated into the Site Environmental Management Plan. Further flora and vegetation information is referenced in the Botannica (2021) Flora, Vegetation and Fauna Assessment, a report prepared for Widgie Nickel Ltd and referenced in Appendix A.

3.5.2 Fauna

Botannica were commissioned in November 2021 to undertake a desktop and field study of the Mt Edwards Project Investigation Area (PIA) in accordance with the requirements documented in EPA Guidance Statement No 56 and Position Statement No. 3.

The focus of this study was to investigate the likelihood of identified Threatened and Priority listed fauna occurring in the PIA and to conduct fauna habitat mapping to identify habitat types that may be suitable for any identified Threatened and Priority listed fauna that may occur within the region.

The Munda Project is located on the foot slopes of a drainage plain with sheetwash areas and drainage lines supporting primarily Eucalyptus woodlands over chenopods and saltbush. The remnant vegetation is in a good to very good condition and is relatively dense with an established lower middle and upper strata. There is evidence of mining impacts throughout the Project area.

Based on vegetation and associated landforms defined within the flora and vegetation assessment, four broad scale terrestrial fauna habitats were identified, however only two were described within the Munda Gold Project Tenure (Botannica, 2021). Eucalyptus woodland on clay loam plain and Eucalyptus woodland on rocky hillslope.

A desktop review identified 8 terrestrial vertebrate species of conservation significance that have the potential to occur within the Investigation Area (Botannica, 2021) with a full fauna likelihood assessment outlined in Appendix D of the Botannica (2021) report.

Malleefowl *(Leipoa occellata*) is listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Schedule 3 of the Western Australian *Biodiversity Conservation Act 2016 (BC Act).*

Habitat is reported to be marginal/or unsuitable for breeding due to the nature of the vegetation. No evidence of current or recent malleefowl activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the survey area. Significant impact to this taxon is considered unlikely.

Grey Falcon (*Falco hypoleucos*) – Vulnerable. This species is sparsely recorded throughout inland Australia. Suitable habitat may be present, but is unlikely to represent critical habitat. Significant impact is considered unlikely.

Peregrine Falcon (*Falco peregrinus*) – Specifically Protected. This species potentially utilises some sections of the survey area as part of a much larger home range, though records of its presence are sparse. Although it is commonly recorded in the Goldfields as utilizing disused pit batters for nest sites, its presence was not recorded in the Munda pit environs. Significant impact is considered unlikely.

Night Parrot (*Pezoporus occidentalis*). Status - Endangered. The night parrot has only recently been "rediscovered" through its historical distribution. It prefers areas of large spinifex hummocks in long unburnt grassland habitats. There is no suitable habitat identified within the Investigation Area for roosting or foraging of the Night Parrot. The likelihood of this nomadic species being present in the Project Development Area (PDA) is considered low.

Chuditch (*Dasyurus geoffroii*). Status – Vunerable. Historical records exist from the eastern portion of the Greater Western Woodlands and Goldfields region. Much of the habitats that supported these species in the past has been highly modified or cleared and predation by, and competition from foxes and feral cats has contributed to its decline (DBCA 2016). This species is considered regionally extinct within the Project area.

Arid Bronze Azure Butterfly (*Ogyris subterrestris petrina).* Status - Critically Endangered. Detail on many aspects of the biology and distribution of this arid butterfly is lacking. Its preferred habitat is recorded as smooth barked Mixed *Eucalyptus salubris /E.salmonophloia* woodlands on red-brown loam soils with an open understorey (DBCA 2020). The most critical factor for habitat occupancy by the butterfly is the presence of large colonies of the host Sugar Ant (*Camponotus sp. nr terebrans*) as only large colonies can support the ABAB. Being a parasitic species, it requires large numbers of hosts. No large colonies of host ants were recorded and this indicates that ABAB are unlikely to be present.

Inland Hairstreak (*Jalmenus aridus*) – Status - Priority 1. Detail on many aspects of the biology and distribution of this arid butterfly is lacking. Their preferred habitat is summarised as open woodland with abundant mature *Senna artemisiodes ssp. fillifolia* and open areas of well drained exposed ground adjoining host plants (Eastwood et al, 2023). This habitat is not identified within the Project area therefore the presence of this species is considered to be low.

Introduced Animals. A total of 11 introduced mammals could potentially occur in the habitats of the Munda Project Area; of most concern within the Coolgardie bioregion are the introduced herbivores; the European rabbit, feral goats, and donkey which have the most widespread impact on fauna habitats through grazing and trampling. Feral cats and foxes are present, and these represent a threat to ground dwelling fauna including the Chuditch.

A series of recommendations that will assist in minimising the impact on the habitats of a range of terrestrial animals during clearing and mining operations will be outlined in the Project Environmental Management Plan. The clearing areas will be inspected prior to the commencement of ground disturbing activities and the findings in respect to Malleefowl will be reported in the Annual Native Vegetation Clearing Report to DEMIRS.

3.5.3 Conservation Significance

The Eastern Goldfield subregion contains 16 vegetation associations, predominately open *Eucalyptus* woodlands, that have at least 85 per cent of their total extent in the bioregion (Cowan 2001) The subregion is considered a centre of endemism for Eucalypts in the Goldfields Woodlands region, and is also noted for the diversity of *Acacia* spp. and ephemeral flora communities of the tertiary sandplain shrublands and the valley floors of woodland areas.

The significance of the biota of the Munda area was assessed in three contexts – State, regional and local levels. As no TEC's or threatened taxa was recorded during the Munda field surveys, the proposed extension of the mining area has no significance at a state level. Of the fauna which could occur in the area, Botannica identified 3 species of conservation significance that have the potential to occur in the Munda area. The Malleefowl *(Leipoa ocellata*), Grey Falcon *(Falco hypoleucos)* and the Peregrine Falcon *(Falco peregrinus*) are Scheduled species under the Western Australian *Biodiversity Conservation Act (2016).*

Of the Scheduled species identified in the desktop study, all are in urgent need of conservation attention and Action Plans involving a range of conservation activities in conjunction with targeted predator eradication are being managed by the DBCA with some success in the Region.

The presence of Schedule 1 fauna in the Munda mine area, and remaining following the recommencement of mining, is considered highly unlikely, due to the lack of suitable habitat, a long history of land disturbance from mining and exploration, feral grazing, and timber cutting. In respect to Malleefowl, their physical presence was not recorded in the Munda Project environs during the recent surveys (Botannica, 2021). There are no matters of national environmental significance as defined by the Commonwealth *EPBC Act (1999)* or threatened species or critical habitat listed under the *BC Act (2016)* and identified within the Munda survey area.

The LOM is of short duration (approximately 5 years) and the impact of the limited clearing on small, regional fauna is expected to be minimal, with the return of many terrestrial species back into disturbed areas after site decommissioning and rehabilitation. Threatening processes identified in the CALM Biodiversity Audit (Cowan 2002), include vegetation clearing and fragmentation, grazing pressure, feral animals (goats, foxes and cats), changed fire regimes, weed spread, salinity, mining and poaching birds' species.

Management of Clearing Impacts

The current proposal to expand the Munda Project footprint will result in short term increase to site emissions and the disturbance footprint at the site. Operational impacts can be managed through (a) minimisation of disturbance and clearing, (b) adopting progressive clearing as required for Project development stages (c) avoiding permanent changes to drainage patterns and sheet flow zones, (d) controlling weed spread, (e) reducing impacts to soils and haul road verges by using best quality ground water during dust suppression, and (f) progressive rehabilitation of disturbed areas during operations. No assemblages of plant species identified in the Botannica (2021) Survey are representative of TEC or PEC communities. The near mine drainage lines are ephemeral and do not support riparian or wetland vegetation. There is no evidence that floral or faunal habitat of regional significance will be significantly impacted by the proposed recommencement of mining operations. A summary of findings against the 10 Clearing Principals are outlined in Table 3 with supporting information referenced in the Botanica (2021) report in Appendix A.

Table 3: Summary of Findings Against the 10 Clearing Principles

	Principle Native vegetation should not be cleared if it:	Assessment	Outcome
(a)	Comprises a high level of biological diversity.	Vegetation within the Munda survey area is considered to be of low biological diversity and is well represented outside of the survey area. There are no Threatened or Priority Ecological Communities within the Munda survey area.	Clearing is unlikely to be at variance with this principle
(b)	Comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	The basic fauna search did not record any evidence for the presence of significant fauna or habitat within the Munda survey area.	Clearing is unlikely to be at variance with this principle
(c)	Includes, or is necessary for the continued existence of rare flora.	No Threatened Flora taxa, pursuant to the BC Act and the EPBC Act were identified within the Munda survey area.	Clearing is unlikely to be at variance with this principle
(d)	Comprises the whole or part of or is necessary for the maintenance of a threatened ecological community (TEC).	No TEC listed under the EPBC Act or by the BC Act occur within the Munda survey area or the Eastern Goldfields subregion.	Clearing is not at variance with this principle
(e)	Is significant as a remnant of native vegetation in an area that has been extensively cleared	All vegetation associations retain >98% of their original pre-European vegetation extent.	Clearing is unlikely to be at variance with this principle
(f)	Is growing, in, or in association with, an environment associated with a watercourse or wetland	Low order ephemeral drainage lines were identified within the Munda survey area. Site does not occur adjacent to major watercourse or wetland	Clearing is unlikely to be at variance with this principle
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The survey area and surrounding region has not been extensively cleared. Clearing within the Munda survey area is not considered likely to lead to land degradation issues such as salinity, water logging or acidic soils.	Clearing is unlikely to be at variance with this principle
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The survey area is not located within or adjacent to conservation areas, Environmentally Sensitive Areas or Nationally Important Wetlands.	Clearing is unlikely to be at variance with this principle
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	There are several low order ephemeral drainage lines within the Munda survey area, and a moderate-potential terrestrial GDE is predicted over the whole of the Widgiemooltha survey area.	Clearing may be at variance with this principle although hydrological assessment by Rockwater (2024) did not identify near surface groundwater resources
(j)	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	Rainfall in the Eastern Goldfields subregion has an average rainfall of 200-300mm and an evaporation rate of 2400 mm. Clearing within the Munda pit limited catchment area is not likely to increase the incidence or intensity of flooding within the survey area or surrounds. (Rockwater 2024)	Clearing is unlikely to be at variance with this principle

4. SENSITIVE ENVIRONMENTAL RECEPTORS

This section provides details of any sensitive (environmental or social) receptors potentially impacted by the proposed open pit cutback mining proposal at the Munda Gold Project.

The Munda deposit is situated on Unallocated Crown Land approximately 5km to the west of the hamlet of Widgiemooltha, the closest receptor to the Project.

4.1 Heritage, Community and Consultation

The Munda Gold Project tenure is within the Marlinya Ghoorlie Native Title Claim (MGNTCG) area. Terra Rosa Consulting who are the Heritage Service Providers for MGNTCG has recently completed a Heritage Survey for the Mt Edwards Haul Road Extension on L15/414. No registered or significant sites were identified during the survey that was held in June 2024.

Searches of the Department of Planning, Land and Heritage online Aboriginal Cultural Heritage Inquiry System (ACHIS) - Site Register for the relevant tenure - M15/87 and L15/414 have identified no Registered or located sites within the proposed Munda mining or infrastructure areas. ACHIS Reports are referenced in Appendix B.

There are no expected impacts on areas of significance to European cultural heritage within the proposed Munda mining areas. No information for the Munda mine area is referenced in the Shire of Coolgardie Municipal Inventory of Heritage Places Register (2012) or the State of WA Heritage Council inHerit Database (2024).

As part of the proposed recommencement of mining at Munda Gold Project, Widgie Gold have completed a range of community and regulatory consultation programmes. These have included correspondence with the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS – Perth, Kalgoorlie), and MGNTCG. Discussions have also been held with local government – Shire of Coolgardie and Main Roads in respect to planned ore haulage to Coolgardie. This process will continue.

4.2 Weed Management

Several well-known weed species have shown themselves to be well adapted to colonisation of disturbed ground in the Eastern Goldfields. No declared or WONS weed species were identified during the site surveys of the proposed Munda Project Development areas (Botannica, 2021) although 3 common Goldfields environmental weeds are present in the mine environments. Operational management strategies adopted to stop weed spread include:

- Materials (i.e. soil) should not be removed from sites for reuse where weed infestations are evident without prior spraying;
- Require as a Site condition that all earthmoving equipment and vehicles are washed down prior to the initial transport to site and are soil free;
- Existing infestations in the general project area and stockpiles will be brought to the attention of the Mine Management for action;

- Undertake progressive rehabilitation of disturbed areas, (where feasible) to assist in reducing weed spread by promoting competition from local native species, and;
- Mine personnel are made aware of weed issues through the Site Induction Programme.

4.3 Land Discharge

There is a minimal risk for liquid waste such as hydrocarbons to enter the environment during land clearing and stockpiling operations. Servicing of earth moving equipment will only be permitted in designated areas.

4.4 Closure and Rehabilitation Management

The Australian and New Zealand Minerals and Energy Council and the Minerals Council of Australia have jointly produced a high-level framework for the development of Mine Closure Plans. The Western Australian Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) has published a revised Statutory Guideline for Mine Closure Plans and Mine Closure Plan Guidance – how to prepare in accordance with the Statutory Guidelines. The Munda Gold Project Mine Closure Plan was submitted in March 2021 and is awaiting assessment and mine closure aspects arising from the proposed development will be discussed in the mining proposal submission expected to be lodged in December 2024. Rehabilitation of areas cleared in accordance with this Clearing Permit Application will be identified in the MCP and a rehabilitation prescription adopted in accordance with the MCP.

The MCP guidelines recommend that final mine rehabilitation and decommissioning should ensure:

- That Stakeholders have their interests considered during the mine closure process and that the process of closure occurs in an orderly cost effective and timely manner;
- That the cost of closure is adequately represented in company accounts and the community is not left with a liability;
- There is clear transparent accountability and adequate resources for the implementation of the Closure Plan.
- The establishment of a set of indicators (i.e. completion criteria) that will demonstrate the successful completion of the closure process be developed prior to plan implementation, and
- That all statutory requirements are met.

4.5 Rehabilitation Concepts

Rehabilitation is defined as the implementation of procedures resulting in the return of an area to a sustainable biological condition such that it does not require ongoing maintenance. The primary objectives for the closure and rehabilitation of the Munda Gold Project are outlined below. These are:

- Ensure risks to public safety are minimised and that the community do not inherit any closure liabilities and site is returned to a condition that will support current land uses.
- Stable topographic conditions are established that will support, a self-sustaining indigenous vegetation community consistent with the Land System and final land use objectives.
- Minimise off site impacts by removing deleterious materials, controlling infiltration, erosion, sedimentation and the degradation of existing drainages.

- Employ rehabilitation methods that are technically effective and cost efficient, rely on standard and proven engineering practices that do not require ongoing maintenance to ensure performance.
- Ensure the protection and conservation during rehabilitation works of any identified elements of the cultural and conservation estate within the mining leases.

In the event of a Temporary Mine Closure, the transition from operations to Care and Maintenance status will be an orderly and managed process in accordance with the provisions of the approved Plan.

5. REFERENCES

Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia (ANZMEC / MCA). 2000. *Strategic Framework for Mine Closure.*

Beard, J.S. 1990. *Plant Life of Western Australia*. Published by Kangaroo Press, NSW.

Botanica Consulting (2021). Mt Edwards Project - Flora, Vegetation and Fauna Assessment prepared for Widgie Nickel Ltd..

Bureau of Meteorology (2024). Climate Averages for Norseman web accessed September 2024, *www.bom.gov.au*.

Bureau of Meteorology (2024). The Groundwater Dependent Ecosystems Atlas (GDE Atlas) Accessed at www.bom.gov.au/water/about/publications/document/BOM on November 09, 2024.

Cowan M (2001). Coolgardie 3 (COO3 – Eastern Goldfields subregion) in May J.E. & McKenzie N. L. (eds) Biodiversity audit of Western Australia's 53 biogeographical subregions in 2002. Department of Conservation and Land Management, Perth WA.

DAFWA (2014). Soil Landscape System of Western Australia, Department of Agriculture and Food Western Australia

Department of Biodiversity, Conservation and Attractions (2016). Fauna Profile - Chuditch *(Dasyurus geoffroii)*

Department of Biodiversity, Conservation and Attractions (2019a) List of Priority Ecological Communities endorsed by the Western Australian Minister for the Environment, DPaW Perth WA

Department of Biodiversity, Conservation and Attractions (2019b) List of Threatened Ecological Communities endorsed by the Western Australian Minister for the Environment, DPaW Perth WA

Department of Climate Change, Energy, the Environment and Water 2024. *Interim Biogeographic Regionalisation for Australia (IBRA) (Sub-regions) version 7.0*, Spatial Dataset. Accessed at http://www.dcceew.gov.au/environment/land/nrs/science/ibra -November 2024.

DCCEEW (2024). Protected Matters Search Tool viewed 26 March 2024. https://pmst.awe.gov.au/#/map

Department of Environment Regulation. (2017) Identification, Reporting and Classification of Contaminated Sites in Western Australia Department of Environment Regulation, Perth, Western Australia.

Department of Water and Environment Regulation (2021). Guideline – Assessment and Management of Contaminated Sites Perth, Western Australia.

Department of Biodiversity, Conservation and Attractions. 2020. *Arid bronze azure butterfly.* Published 11 September 2020. Website: *https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-andcommunities/threatened-animals/562-arid-bronze-azure-butterfly. Accessed February 2021*

Department of Planning Lands and Heritage (2024). Aboriginal Cultural Heritage Enquiry System - Searches of Registered Sites and Lodged Places Data set on November 09, 2024. Accessed https://espatial.dplh.wa.gov.au/ACHIS/index.html?viewer=ACHIS.

DPIRD (2024). Western Australian Organism List (WAOL) Database search Department of Primary Industries and Regional Development, Western Australia. Available: http://www.agric.wa.gov.au/bam/organism-list-waol

DPIRD (2022): *Soil Landscape Mapping – Systems (DPIRD-064)*, mapping shapefiles obtained from data.wa.gov.au, last updated July 18, 2022.

Eastwood et. al. (2023). Current distribution, preferred habitat, behaviour, and biology of the Inland Hairstreak, *(Jalmenus aridus)* Graham and Moulds, 1988 (Lepidoptera: Lycaenidae) in the Eastern Goldfields Region of Western Australia. Records of the WA Museum 38, Perth

Government of Western Australia (2024). Water Register accessed on November 09, 2024 via website https://maps.waterwa.gov.au/#/webmap/register.

International Council on Mining and Metals, London, United Kingdom (ICMM). 2008. *Planning for Integrated Mine Closure: Toolkit*.

Morris, P.A. (1993). Archaean mafic and ultramafic volcanic rocks, Menzies to Norseman, Western Australia. Report 36. Geological Survey Western Australia. Perth.

Payne A.L; Mitchell A.A, and P. Henning (1998). Land Systems of the Kambalda Area and Surrounds. Department of Agriculture Natural Resource Management Services. Perth June 1998.

Rockwater (2024). Hydrological and Hydrogeological Assessment - Munda Deposit Widgiemooltha, August 2024.

Shire of Coolgardie (2012) Municipal Inventory of Heritage Places Register

Tille, P. (2006). *Soil Landscapes of Western Australia's Rangelands and Arid Interior*, Department of Agriculture and Food Western Australia

DWER (2021) WQPN 25 - Land use compatibility tables for public drinking water source areas

6. DEFINITIONS

Application Area	Area of proposed project native vegetation clearing including buffers zones as listed in the application form.
Care and maintenance	All mining operations suspended, site being maintained and monitored. Resident caretaker – considered Managed Care and Maintenance.
Disturbed	Area where vegetation has been cleared and/or topsoil (surface cover) removed.
Disturbance type	A feature created during mining or exploration activity, e.g. waste dumps, haul roads, access roads, ROM, plant site, TSF, borrow pits, drill pads, stockpiles, office blocks, accommodation village, etc
Investigation Area.	Area of survey surrounding proposed development for baseline studies also called Environmental Survey Area - ESA.
Life of mine	Expected duration of mining and processing operations.
Orthophotography	Use of aerial photography to measure areas of disturbance.
Pits	All open excavations including active mineral rock, gravel, sand, clay, bauxite and salt-pan extraction areas.
Project	The total integrated mining operations in which a number of sites contribute to the overall operation to supply ore, processing facilities and disposal of waste products.
Preliminary earthworks	Reshaping, capping, water/wind erosion control, rock armouring.
Rehabilitated	Areas are safe, have demonstrated stability under representative climatic conditions, non-polluting and support a functioning, self-sustaining ecosystem comprising local native species.
Relinquished	Agreed closure criteria met, government “sign-off” achieved, all obligations under the Mining Act removed and bonds retired.
Reporting period	Twelve-month period from reporting month as specified in tenement conditions e.g. if reporting month is June, reporting period would be June – May.
Revegetation	Establishment of self-sustaining vegetation cover after earthworks have been completed.
Tenement	Land tenure granted under the *Mining Act 1978* e.g. Mining Lease Exploration Licence, Prospecting Licence, Miscellaneous Licence, General Purpose Lease.
Waste landforms	Includes all mullock and waste rock disposal areas.

7. ACRONYMS

AER	Annual Environmental Report
AMD	Acid Mine Drainage
BOM	Bureau of Meteorology
CIL	Carbon in Leach
CPA	Clearing Permit Application
DBCA	Department of Biodiversity Conservations and Attractions
DWER	Department of Energy, Water and Environmental Regulation
DEMIRS	Department of Energy Mines Industry Regulation and Safety
DOW	Department of Water now incorporated in DWER
DSR	Drill Site Rehabilitation
Ec	Electrical Conductivity
EPA	Environmental Protection Authority
ESA	Environmental Survey Area
GDE	Groundwater Depended Ecosystems
GWL	5C Groundwater Well Licence
IA	Investigation Area
LJE	Leanne James Environmental
L	Miscellaneous Lease
M	Mining Lease
mAHD	Metres above the Australian Height Datum
MCM	Managed Care and Maintenance
MOU	Memorandum of Understanding between EPA and DMP
PDA	Project Development Area
PAF	Potential Acid Forming
PIA	Project Investigation Area
ROM	Run of Mine
SOC	Shire of Coolgardie
TDS	Total Dissolved Solids
TEC	Threatened Ecological Community
WA	Western Australia
WRL	Waste Rock Landform

Units of Measurement

A	per annum
dS/m	deci Siemens per meter
ha	hectare
kL	kilolitre
m	metre
mg/L	milligrams per litre
Mt	million ton

Appendix A : Environmental Baseline Reports

- **Baseline Flora, Vegetation and Fauna Assessment (Botannica (2021). A report prepared for Widgie Nickel Ltd**

- **Munda Deposit Widgiemooltha -Hydrological and Hydrogeological Assessment (Rockwater 2024). A report prepared for Auric Mining Ltd**

Mt. Edwards Project

Flora, Vegetation and Fauna Assessment

Prepared for Widgie Nickel Ltd.

FINAL
December 2021

Prepared by
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Disclaimer

Quality Assurance

An internal quality review process has been implemented to each project task undertaken by BC. Each document and its contents is carefully reviewed by core members of the Consultancy team and signed off at Director Level prior to issue to the client. Draft documents are submitted to the client for comment and acceptance prior to final production.

Cover Photo: Vegetation within Mt. Edward survey area (12/11/2021)

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1 EXECUTIVE SUMMARY

Botanica Consulting Pty Ltd (Botanica) was commissioned by Widgie Nickel to undertake a reconnaissance flora/ vegetation survey and basic fauna survey of six areas within their Mt. Edwards Project (collectively referred to as the 'survey area'). These areas are Zabel (160 ha), McEwen (301 ha) Armstrong (863 ha), Cooke (525 ha), 26N (341 ha), Munda (364 ha), and Widgie South (450 ha), for a total area of approximately 3,004 ha. The survey area is located approximately 30 km south-west of Kambalda, Western Australia. This assessment is intended to support a Native Vegetation Clearing Permit (NVCP) application for the Mt. Edwards project.

The survey area lies within the Eastern Goldfield (COO3) subregion of the Coolgardie Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Eastern Goldfield subregion (5,102,428 ha) lies on the Yilgarn Craton's Eastern Goldfields Terrain, which is described as gently undulating plains with a subdued relief, interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001).

The vegetation consists of Mallees, Acacia thickets and shrub-heaths on sandplains, with diverse *Eucalyptus* woodlands occurring around salt lakes, on ranges, and in valleys. Salt lake support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic granulite of the Fraser Range, and the area is rich in endemic Acacias.

In accordance with Beard (1990) the survey area is located in the Coolgardie Botanical District of the Southwestern Interzone Province. The landscape is described as gently undulating with occasional ranges of low hills, with sandplains in the western part and some large playa lakes. Soils are principally brown calcareous earths, which overlays the Proterozoic granite and gneiss of the Fraser Range block and Archaean granite, with infolded volcanics and meta-sediments, of the Yilgarn block. Vegetation is predominately *Eucalyptus* woodlands, with slopes and flats containing *E*. *longicornis* alongside *E. salubris* and *E*. *salmonophloia*. Woodland understories range from tall sclerophyll shrubland dominated by *Melaleuca pauperiflora* to soft-leaved saltbush shrubland of *Atriplex vesicaria* and *A*. *nummularia*. Some hill slopes contain mallees of *E*. *livida* or *E*. *loxophleba*, while ironstone ridges are covered in thickets of *Acacia quadrimarginea*, *Allocasuarina acutivalvis* and *A*. *campestris*. Other vegetation assemblages include species-rich scrub-heaths and *Allocasuarina* thickets on sandplains, merging into *Acacia* thickets and Kwongan vegetation to the north.

The dominant land uses of the Eastern Goldfield subregion includes Unallocated Crown Land (UCL) and Crown reserves and pastoral grazing, with conservation areas and mining leases also present (Cowan, 2001). The survey area is located over tenements M15/87, M15/94, M15/97, M15/99, M15/101, M15/102, M15/103, and M15/653, , and does not occur within a Pastoral Lease.

Prior to the field assessment a literature review was undertaken of previous flora and fauna assessments conducted within the local region. Documents reviewed included:

- Botanica Consulting Pty Ltd. (2016). *Flora and Fauna Assessment Widgiemooltha Project.* Unpublished report prepared on behalf of Mincor Resources N.L., December 2016
- Botanica Consulting Pty Ltd. (2020). *Reconnaissance Flora/ Vegetation Survey and Basic Fauna Survey Lake Lefroy/ Lake Fore.* Unpublished report prepared on behalf of Mincor Resources N.L., August 2020

In addition to the literature review, searches of the following databases were undertaken to aid in the compilation of a list of significant flora within the survey area:

- DBCA Threatened/ Priority Flora spatial data (DBCA, 2019a);
- DBCA NatureMap database (DBCA, 2021b); and
- EPBC Protected Matters search tool (DAWE, 2021a).

The NatureMap species search and EPBC Protected Matters search were conducted with a 40 km buffer from the survey area.

The NatureMap desktop search identified 558 vascular flora species, including 19 introduced (weed) species, as occurring within 40 km of the survey area. These taxa represent 304 genera from 65 families, with the most diverse families being Myrtaceae (80 species), Fabaceae (66 species) and Asteraceae (55 species). The most dominant genera were Eucalyptus (44 species), Acacia (39 species) and Eremophila (28 species). This total includes 19 introduced (weed) species (3.4%).

The desktop review identified 20 introduced flora (weed) species, representing 12 families, as potentially occurring in the vicinity of the survey area. Of these, two are listed as a Declared Pest on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management (BAM) Act 2007*, with Common Lantana (*Lantana camara*) is also listed as a Weed of National Significance.

The assessment of the DBCA Priority/ Threatened flora database records (DBCA, 2019), NatureMap (DBCA, 2020) and Protected Matters searches (DAWE, 2020a) and previous relevant literature identified 36 significant flora species recorded within a 40 km radius of the survey area. These consist of one Threatened, 15 Priority 1, five Priority 2, 12 Priority 3 and three Priority 4 taxa.

These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area. The assessment identified two taxa as previously recorded within the survey area, consisting of two Priority 1 taxa. In addition, the assessment identified four taxa as possibly occurring in the survey area, consisting of one Priority 1, one Priority 2 and two Priority 3 taxa.

The Protected Matters search (DAWE, 2020a) did not identify any Threatened Ecological Communities recorded within 40 km of the survey area. Analysis of the Priority Ecological Communities within the Goldfields region (DBCA, 2017) did not identify any significant vegetation assemblages as likely or possibly occurring within the survey area.

All vegetation associations retain >98% of their pre-European extent.

According to the results of the NatureMap search (DBCA, 2021b), a total of 191 terrestrial vertebrate fauna taxa have been recorded within 40 km of the survey area, consisting of 110 bird, 14 mammal, 65 reptile and two amphibian taxa. This total includes three introduced (feral) species (1.6%).

The desktop review identified eight terrestrial vertebrate fauna species of conservation significance as previously being recorded in the regional area, consisting of four Threatened, one Priority 4 and three migratory or otherwise protected species. In addition, six migratory wading/shorebird species were assessed collectively due to their similar habitat requirements.

Habitat and distribution data was used to determine the likelihood of occurrence within the survey area. The assessment identified three significant fauna species as potentially occurring in the survey area, consisting of two Vulnerable and one Specially Protected taxa.

No Environmentally Sensitive Areas were identified within the survey area.

There are no wetlands of international importance (Ramsar Wetlands) or national importance (Australian Nature Conservation Agency Wetlands) within the survey area.

There are no proposed or gazetted conservation reserves within the survey area.

The closest significant environmental feature is the Dordie Rocks Nature Reserve, which is DBCA-managed land located approximately 6 km south of the Widgie South portion of the survey area. Disturbances within the survey area are unlikely to impact this area.

Botanica conducted a reconnaissance flora/ vegetation and basic fauna survey on the 11th, 12th and 15th November 2021. The survey area was traversed on foot and with 4WD by Jennifer Jackson (Senior Botanist, BSc (Honours) Environmental Management) and Chloe Porteous (Field Technician).

The field survey identified 114 vascular flora taxa within the survey area. These taxa represented 62 genera across 32 families, with the most diverse families being Chenopodiaceae and Fabaceae (14 species each), followed by Myrtaceae and Scrophulariaceae (13 species each). Dominant genera include *Eremophila* (13 species), *Eucalyptus* (11 species) and *Acacia* (nine species).

Of the flora recorded, six species (5.3%) were introduced (weed) species. None of these species are listed as a Weed of National Significance or a Declared Pest in Western Australia.

No Threatened flora species were recorded within the survey area.

The Priority 1 flora *Philotheca apiculata* was recorded within the survey area, consisting of approximately 144 individuals over three populations. These populations were located in the Cooke and Armstrong project areas and were all associated with the RH-EW1 vegetation community.

No other Priority or otherwise significant flora were recorded within the survey area. The Priority 1 species *Austrostipa* sp. Carlingup Road (S. Kern & R. Jasper LCH 18459), which was previously recorded in the survey area (Botanica, 2016), was not observed to be present.

A total of four broad-scale vegetation communities were identified within the survey area. Vegetation community descriptions and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities.

The survey found CLP-EW1 was the most widespread community in the survey area, occupying 1,526 ha (50.8%), while DD-EW1 was the most restricted with 44 ha (1.6%). The most diverse vegetation community was CLP-EW1 with 91 species (79.8%), while the least diverse were DD-EW1 and SCLP-MW1, each with 25 species (21.9%).

No Threatened or Priority ecological communities or otherwise significant vegetation were identified within the survey area.

Based on vegetation and associated landforms identified during the flora and vegetation assessment, four broad scale terrestrial fauna habitats were identified as occurring within the survey area.

No evidence for the presence of Malleefowl, including nesting mounds, tracks or other signs, were recorded within the survey area. No other evidence of significant fauna species were observed during the survey.

Native vegetation condition within the survey area ranged from ‘very good to ‘completely degraded’. Disturbances within the survey area include mining operations, access roads and tracks, the presence of some weed species and cumulative historical impacts.

The assessment found that the proposed vegetation clearing activities may be at variance with clearing principles (f) and (i).

2 INTRODUCTION

Botanica Consulting Pty Ltd (Botanica) was commissioned by Widgie Nickel to undertake a reconnaissance flora/ vegetation survey and basic fauna survey of six areas within their Mt. Edwards Project (collectively referred to as the 'survey area'). These areas are Zabel (160 ha), McEwen (301 ha) Armstrong (863 ha), Cooke (525 ha), 26n (341 ha), Munda (364 ha), and Widgie South (450 ha), for a total area of approximately 3,004 ha (Figure 2-1). The survey area is located approximately 30 km south-west of Kambalda, Western Australia. This assessment is intended to support a Native Vegetation Clearing Permit (NVCP) application for the Mt. Edwards project.

2.1 Objectives

The flora assessment was conducted in accordance with the requirements of a reconnaissance flora survey as defined in *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016* (EPA, 2016a). The objectives of the assessment were to:

- gather background information on flora and vegetation in the target area (literature review, database and map-based searches);
- identify significant flora, vegetation and ecological communities and assess the potential sensitivity to impact;
- conduct a field survey to verify / ground truth the desktop assessment findings;
- undertake floristic community mapping to a scale appropriate for the bioregion and described according to the National Vegetation Information System (NVIS) structure and floristics;
- undertake vegetation condition mapping;
- assess the project area's plant species diversity, density, composition, structure and weed cover, using NVIS classification system for vegetation description;
- assess Matters of National Environmental Significance (MNES) and indicate whether potential impacts on MNES as protected under the EPBC Act are likely to require referral of the project to the Commonwealth DAWE; and
- determine the State legislative context of environmental aspects required for the assessment.

The fauna assessment was conducted in accordance with the requirements of a basic terrestrial fauna survey as defined in *Technical Guidance - Terrestrial Fauna Surveys for Environmental Impact Assessment – June 2020* (EPA, 2020). The objectives of the assessment were to:

- Undertake a literature review, including map-based information searches of all current and relevant literature sources and databases relating to the survey area;
- Undertake a desktop investigation to identify any previously recorded occurrences of or potentially occurring Threatened and Priority listed fauna within the survey area;
- Undertake searches on available databases for details relating to any Threatened and Priority listed fauna previously identified as occurring or potentially occurring within the survey area;
- Conduct fauna habitat mapping and identify habitat types which are suitable for each significant fauna considered likely or possible to occur, or fauna recorded in the survey area;
- Compile an inventory of fauna species occurrences within the survey area;
- Undertake opportunistic, low intensity sampling of fauna; and
- Report on the conservation status of species present using the Western Australian Museum and *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) databases for presence of Threatened and Priority listed fauna species within the survey area.

Figure 2-1: Regional map of the desktop survey area/ survey area

3 BIOPHYSICAL ENVIRONMENT

3.1 Regional Environment

The survey area lies within the Eastern Goldfield (COO3) subregion of the Coolgardie Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA).

The Eastern Goldfield subregion (5,102,428 ha) lies on the Yilgarn Craton's Eastern Goldfields Terrain, which is described as gently undulating plains with a subdued relief, interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line (Cowan 2001).

The vegetation consists of Mallees, Acacia thickets and shrub-heaths on sandplains, with diverse *Eucalyptus* woodlands occurring around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic granulite of the Fraser Range, and the area is rich in endemic Acacias.

In accordance with Beard (1990) the survey area is located in the Coolgardie Botanical District of the Southwestern Interzone Province. The landscape is described as gently undulating with occasional ranges of low hills, with sandplains in the western part and some large playa lakes. Soils are principally brown calcareous earths, which overlays the Proterozoic granite and gneiss of the Fraser Range block and Archaean granite, with infolded volcanics and meta-sediments, of the Yilgarn block. Vegetation is predominately *Eucalyptus* woodlands, with slopes and flats containing *E*. *longicornis* alongside *E. salubris* and *E*. *salmonophloia*. Woodland understories range from tall sclerophyll shrubland dominated by *Melaleuca pauperiflora* to soft-leaved saltbush shrubland of *Atriplex vesicaria* and *A*. *nummularia*. Some hill slopes contain mallees of *E*. *livida* or *E*. *loxophleba*, while ironstone ridges are covered in thickets of *Acacia quadrimarginea*, *Allocasuarina acutivalvis* and *A*. *campestris*. Other vegetation assemblages include species-rich scrub-heaths and *Allocasuarina* thickets on sandplains, merging into *Acacia* thickets and Kwongan vegetation to the north.

3.2 Land Use

The dominant land uses of the Eastern Goldfield subregion includes Unallocated Crown Land (UCL) and Crown reserves and pastoral grazing, with conservation areas and mining leases also present (Cowan, 2001). The survey area is located over tenements M15/87, M15/94, M15/97, M15/99, M15/101, M15/102, M15/103, and M15/653 , and does not occur within a Pastoral Lease.

3.3 Soil Landscape Systems

The survey area lies within the Kalgoorlie Province, located in the southern Goldfields between Paynes Find, Menzies, Southern Cross and Balladonia. The landscape consists of undulating plains (with some sandplains, hills and salt lakes) on the granitic rocks and greenstone of the Yilgarn Craton. Soils range from calcareous loamy earths and red loamy earths with some salt lake soils to red deep sands, yellow sandy earths, shallow loams and loamy duplexes. Vegetation communities are predominately Eucalypt woodlands with some acacia-casuarina thickets, mulga shrublands, halophytic shrublands and spinifex grasslands.

The Kalgoorlie Province is further divided into six soil-landscape zones, with the survey area located in the Kambalda Zone.

The Kambalda zone is located in the south-eastern Goldfields between Menzies, Norseman and the Fraser Range and contains flat to undulating plains (with hills, ranges and some salt lakes and stony plains) on greenstone and granitic rocks of the Yilgarn Craton. Soils consist of calcareous loamy earths and red loamy earths with salt lakes soils and some redbrown hardpan shallow loams and red sandy duplexes. Vegetation includes red mallee, blackbutt-salmon gum-gimlet woodlands with mulga and halophytic shrublands (and some spinifex grasslands).

The soil landscape zones are further divided into soil landscape systems, with the survey areas located within four landscape systems, as described in Table 3-1 and shown in Figure 2-1, in accordance with soil landscape system mapping data (Government of Western Australia, 2019).

Table 3-1: Soil landscape systems within the survey area

Soil Landscape System	Description	Extent within Survey Area
Graves System	Basalt and greenstone rises and low hills supporting eucalypt woodlands with prominent saltbush and bluebush understoreys.	1,330 ha (44.3%)
Gumland System	Extensive pedeplains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys.	1,128 ha (37.5%)
Moriarty System	Low greenstone rises and stony plains supporting chenopod shrublands with patchy eucalypt overstoreys.	349 ha (11.6%)
Red Hill System	Basalt hills and ridges supporting acacia shrublands and patchy eucalypt woodlands with mainly non-halophytic undershrubs.	197 ha (6.6%)

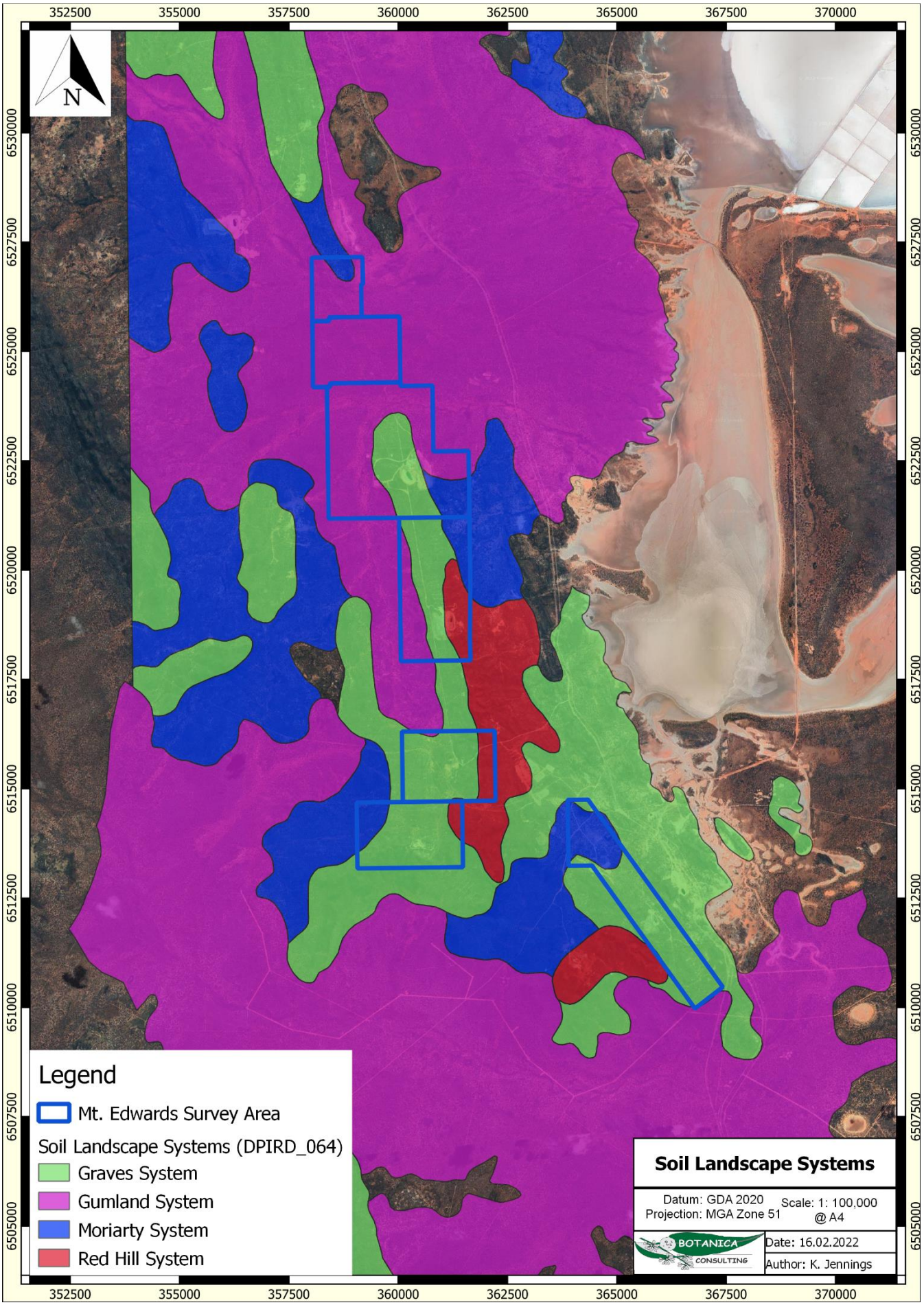

Figure 3-1: Map of soil landscape systems within the survey area

3.4 Regional Vegetation

In accordance with Tille (2006), the vegetation of the Kambalda Zone is typified by the preponderance of stony plains with acacia shrublands and halophytic shrublands, low hills with eucalypt or acacia woodlands with halophytic undershrubs, stony plains with acacia shrublands and alluvial plains with eucalypt woodlands and halophytic undershrubs rangeland.

More broadly, the vegetation of the Kalgoorlie Province is described by Tille (2006) as woodlands of redwood (*Eucalyptus transcontinentalis*), red mallee (*E*. *oleosa*), Dundas blackbutt (*E*. *dundasii*), merrit (*E. flocktoniae*) and salmon gum (*E. salmonophloia*), found on undulating plains over granite. There are also some hummock grasslands with red mallee over spinifex (*Triodia scariosa*) and thickets of Acacia, Casuarina and Melaleuca spp. Plains on greenstone have woodlands of York gum (*E*. *loxophleba*), salmon gum and gimlet (*E*. *salubris*). The valley plains have woodlands of salmon gum, red mallee, Goldfields blackbutt (*E*. *lesouefii*), gimlet, York gum and morrel (*E*. *longicornis*). These sometimes have an understorey of saltbush (Atriplex spp.), pearl bluebush (*Maireana sedifolia*), sago bluebush (*M*. *pyramidata*) and *Eremophila* spp. There are areas of spinifex grasslands with red mallee, mallees (e.g. *E. youngiana*) and marble gum (*E*. *gongylocarpa*). Low woodlands of mulga (Acacia aneura) and black sheoak (*Casuarina pauper*) over bluebush and saltbush are also present. Apart from the bare salt lake surfaces, saline valley floors have shrublands of samphire (*Tecticornia* spp.) and *Frankenia* spp. in lower areas, shrublands of saltbush and bluebush on red deep sandy duplexes, and woodlands of salmon gum, merrit, red mallee, gimlet and York gum. *Acacia neurophylla*, *A*. *beauverdiana* and *A*. *resinimarginea* thickets grow on gently sloping uplands on granite, with thickets of acacia, casuarina and melaleuca. There are also scrub-heaths and York gum-salmon gum-gimlet woodlands on these uplands. The hilly terrain on greenstone supports woodlands of salmon gum, Goldfields blackbutt, coral gum (*E*. *torquata*), York gum, gimlet, morrel, Dundas blackbutt and black sheoak. Thickets of granite wattle (*Acacia quadrimarginea*) are also present. The stony plains support scattered woodlands of Goldfields blackbutt, gimlet and salmon gum, along with shrublands of saltbush and bluebush. Sandplains in the west have acacia (*A*. *coolgardiensis*, *A*. *ramulosa*, *A*. *aneura*, *A*. *burkittii* and *A*. *tetragonophylla*) shrublands, commonly with patchy native pine (*Callitris glaucophylla, C*. *preissii*) and mallees (*E*. *leptopoda*, *E*. *longicornis* and *E*. *loxophleba*). Native box (*Bursaria occidentalis*), *Melaleuca uncinata* and Hakea recurva may also be present. Hard spinifex (*T*. *basedowii*) grasslands with mulga, marble gum and mallees (e.g. *E*. *kingsmillii*) are found on sandplains to the east. The sandy-surfaced plains support acacia, casuarina and melaleuca thickets; woodlands of York gum, cypress pine (*Callitris columellaris*), salmon gum, gimlet and mulga; and shrublands of bowgada (*A*. *ramulosa*).

3.5 Conservation Values

The Eastern Goldfield subregion contains 16 vegetation associations, predominately open *Eucalyptus* woodlands, that have at least 85 per cent of their total extent in the bioregion (Cowan 2001) The subregion is considered a centre of endemism for Eucalypts in the Goldfields Woodlands region, and is also noted for the diversity of *Acacia* spp. and ephemeral flora communities of the tertiary sandplain shrublands and the valley floors of woodland areas.

The subregion contains one wetland of national importance: Rowles Lagoon System, located approximately 60 km north-west of the survey area. In addition, there are seven wetlands of subregional importance (Cowan, 2001). Other significant assemblages in the region include plant assemblages of the Fraser Range and the Woodline Hills.

No ecosystems are listed as threatened under WA State legislation occur within the subregion, but 18 communities and vegetation associations are thought to be at risk for a variety of reasons. Grazing from livestock, goats and rabbits and impacts from mining are the main threatening processes in the region, with changed fire regimes, erosion and sedimentation also causing significant impacts.

3.5.1 Great Western Woodlands

The survey area lies within the Great Western Woodlands, considered by The Wilderness Society of WA to be of global biological and conservation importance as one of the largest and healthiest temperate woodlands on Earth, containing many endemic taxa. The region covers almost 16 million hectares (160,000 square kilometres), from the southern edge of the Western Australian Wheatbelt to the pastoral lands of the Mulga country in the north, the inland deserts to the northeast, and the treeless Nullarbor Plain to the east.

The Great Western Woodlands provides a connection between southwest forests and inland deserts (Gondwana Link) as well as linking the north-west passage to Shark Bay. The majority of the Great Western Woodlands is unallocated crown land (61.1%) with other interests including pastoral leases (20.4%), conservation reserves (15.4%) unallocated crown land, ex pastoral (2%) managed by the Department of Biodiversity, Conservation and Attractions (DBCA) and private land (approximately 1%).

No specific management strategy or formal conservation status applies to the Great Western Woodlands. The Great Western Woodlands currently includes towns, highways, roads, railways, private property, Crown Reserves, agricultural activities and mining tenements.

3.6 Climate

The climate of the Eastern Goldfield subregion is characterised as arid to semi-arid with 200-300 mm of rainfall, sometimes in summer but usually in winter (Cowan 2001). Rainfall data for the Kalgoorlie-Boulder Airport (#12038) weather station, located approximately 75 km north of the survey area, is shown in Figure 3-2. Mean monthly rainfall ranges from 31.6.5 mm in February to 13.5 mm in September, with a mean annual rainfall of 264.9 mm. The survey was conducted in November 2021, with the preceding months (August-October) being characterised by below-average rainfall. Climate conditions may represent a survey constraint, with potentially below-average presence of flowering material and ephemeral species.

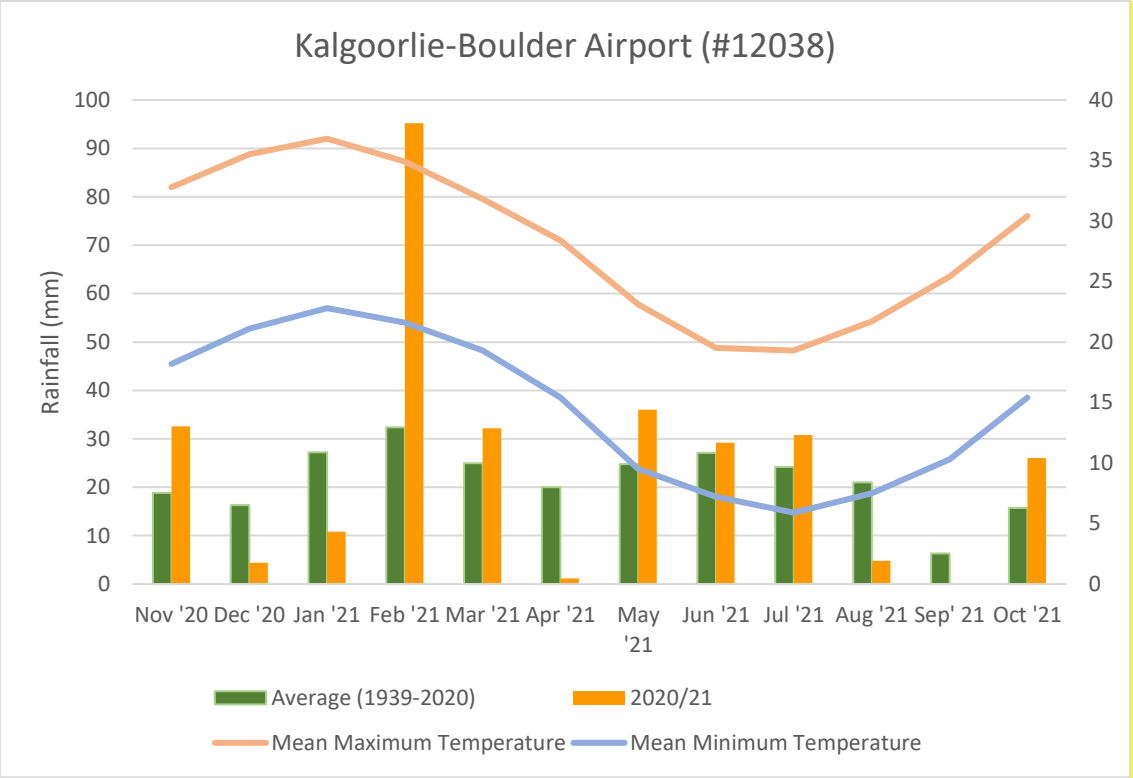

Figure 3-2: Climate data for Kalgoorlie-Boulder Airport (BoM, 2021a)

3.7 Hydrology

According to the Geoscience Australia database (2015), there are no permanent or ephemeral inland waters within the survey area. There are several ephemeral drainage lines within the survey area, including Muldolia Creek (Figure 3-3).

Groundwater Dependent Ecosystems (GDE) includes biological assemblages of species such as wetlands or woodlands that use groundwater either opportunistically or as their primary water source. For the purposes of this report, a GDE is defined as any vegetation community that derives part of its water budget from groundwater and must be assumed to have some degree of groundwater dependency. In accordance with the BoM *Atlas of Groundwater Dependent Ecosystems* (BoM, 2020b) database, there are two moderate-potential terrestrial GDE's within the survey area. These are described in Table 3-2 and their extent shown in Figure 3-3.

There are no potential aquatic GDE's within the survey area.

Table 3-2: Potential GDE's within the survey area

Potential	Geomorphology	Vegetation Description	Area (ha)	Area (%)
Moderate	Undulating plains with some sandplains, ferruginous breakaways; ridges of metamorphic rocks and granitic hills and rises; calcretes, large salt lakes and dunes along valleys.	Medium woodland; salmon gum	652	21.7
		Medium woodland; coral gum (*Eucalyptus torquata*) & goldfields blackbutt (*E. lesouefii*)	2,352	78.3

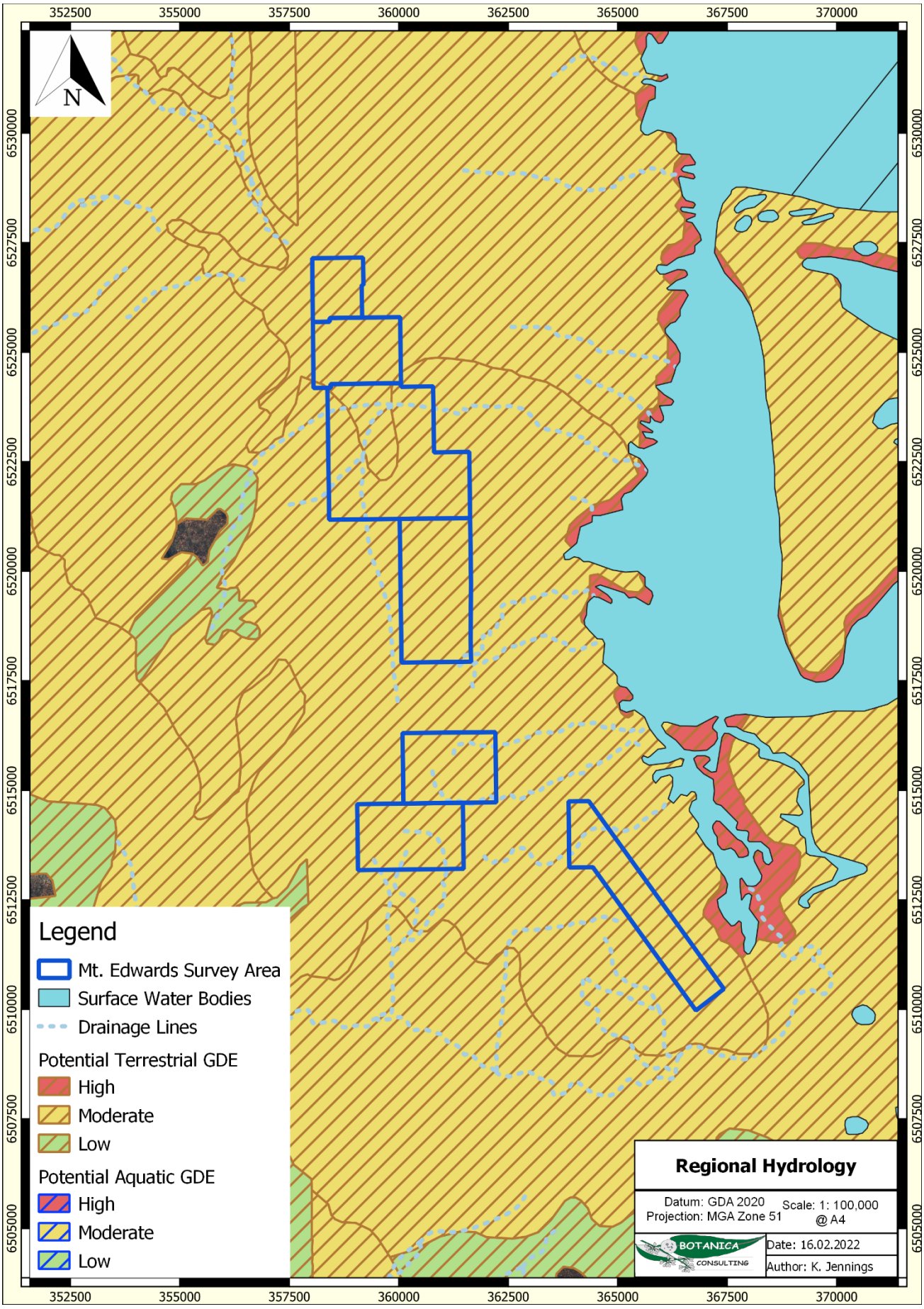

Figure 3-3: Regional hydrology of the survey area

4 SURVEY METHODOLOGY

4.1 Desktop Assessment

Prior to the field assessment a literature review was undertaken of previous flora and fauna assessments conducted within the local region. Documents reviewed included:

- Botanica Consulting Pty Ltd. (2016). *Flora and Fauna Assessment Widgiemooltha Project.* Unpublished report prepared on behalf of Mincor Resources N.L., December 2016
- Botanica Consulting Pty Ltd. (2020). *Reconnaissance Flora/ Vegetation Survey and Basic Fauna Survey Lake Lefroy/ Lake Fore.* Unpublished report prepared on behalf of Mincor Resources N.L., August 2020

In addition to the literature review, searches of the following databases were undertaken to aid in the compilation of a list of significant flora within the survey area:

- DBCA Threatened/ Priority Flora spatial data (DBCA, 2019a);
- DBCA NatureMap database (DBCA, 2021b); and
- EPBC Protected Matters search tool (DAWE, 2021a).

The NatureMap species search and EPBC Protected Matters search were conducted with a 40 km buffer from the survey area.

Significant flora species identified by the desktop review were assessed with regards to their population extent and distribution and preferred habitat to determine their likelihood of occurrence within the survey area.

The assessment categorised flora species as follows:

- Unlikely- Suitable habitat is not expected to occur and/or the survey area is outside the known range of the species.
- Possible- Suitable habitat may be present, and the area is within the known range of the species. This option is also used when there is insufficient information to determine the preferred habitat of a species.
- Likely- Suitable habitat is expected to occur and there are records within 10 km of the survey area.
- Previously Recorded- A record for this species is located within the survey area. Field survey will ground-truth currently occurring individuals and populations.

It should be noted that these lists are based on observations from a broader area than the assessment area (40 km radius) and therefore may include taxa not present. The databases also often include very old records that may be incorrect or in some cases the taxa in question have become locally or regionally extinct. Information from these sources should therefore be taken as indicative only and local knowledge and information also needs to be taken into consideration when determining what actual species may be present within the specific area being investigated.

The conservation significance of flora taxa was assessed using data from the following sources:

- *Environment Protection and Biodiversity and Conservation* (EPBC) *Act 1999*. Administered by the Australian Government (DAWE);
- *Biodiversity Conservation* (BC) *Act 2016*. Administered by the WA Government (DBCA);

- Red List produced by the Species Survival Commission (SSC) of the World Conservation Union (also known as the IUCN Red List – the acronym derived from its former name of the International Union for Conservation of Nature and Natural Resources). The Red List has no legislative power in Australia but is used as a framework for State and Commonwealth categories and criteria; and
- Priority Flora list. A non-legislative list maintained by DBCA for management purposes (released December 2018).

Descriptions of conservation significant species and communities are provided in Appendix A.

4.2 Flora and Vegetation Field Assessment

Botanica conducted a reconnaissance flora/ vegetation and basic fauna survey on the 11th, 12th and 15th November 2021. The survey area was traversed on foot and with 4WD by Jennifer Jackson (Senior Botanist, BSc (Honours) Environmental Management) and Chloe Porteous (Field Technician). The survey effort is shown below in Figure 4-1.

Figure 4-1: GPS track log of the survey effort

4.2.1 Flora Assessment

Prior to the commencement of field work, aerial photography was inspected and obvious differences in the vegetation assemblages were identified. The different vegetation communities identified were then inspected during the field survey to assess their validity. A handheld GPS unit was used to record the coordinates of the boundaries between existing vegetation communities. At each sample point, the following information was recorded:

- GPS location;
- Photograph of vegetation;
- Dominant taxa for each stratum;
- All vascular taxa (including annual taxa);
- Landform classification;
- Vegetation condition rating;
- Collection and documentation of unknown plant specimens; and
- GPS location, photograph and collection of flora of conservation significance if encountered.

Unknown specimens collected during the survey were identified with the aid of samples housed at the Botanica Herbarium and Western Australian Herbarium. Vegetation was classified in accordance with NVIS classifications.

4.3 Data Analysis Tools

Following field assessments, vegetation types and condition were mapped using the GIS program QGIS, and the hectare area/ percentage area of each vegetation type and condition within the survey area was calculated. Spatial maps illustrating the location of vegetation types and any significant flora/ vegetation and fauna were generated using QGIS.

4.4 Terrestrial Fauna Field Assessment

Fauna habitat types were identified across the survey area based on broad major vegetation groups and associated landform. A handheld GPS unit was used to record the coordinates of the boundaries between fauna habitats and each habitat was photographed.

The main aim of the fauna habitat assessment was to determine the likelihood of a species of conservation significance utilising habitat within the survey area. The habitat information obtained was also used to aid in finalising the overall potential fauna list.

Available information on the habitat requirements of the species of conservation significance listed as possibly occurring in the area (determined from the desktop assessment) was researched. During the field survey, the habitats within the survey area were assessed and specific elements identified, if present, to determine the likelihood of listed Threatened and Priority species utilising habitat within the survey area.

Opportunistic observations of fauna species were made during all field survey work.

Fauna of conservation significance identified during the literature review and database searches as previously being recorded in the general area were assessed and ranked for their likelihood of occurrence within the survey area. The rankings and criteria used were:

- Would Not Occur: There is no suitable habitat for the species in the survey area and/or there is no documented record of the species in the general area since records have been kept and/or the species is generally accepted as being locally/regionally extinct (supported by a lack of recent records).

- Locally Extinct: Populations no longer occur within a small part of the species natural range, in this case within 10 or 20 km of the survey area. Populations do however persist outside of this area.

- Regionally Extinct: Populations no longer occur in a large part of the species natural range, in this case within the Goldfields region. Populations do however persist outside of this area.

- Unlikely to Occur: The survey area is outside of the currently documented distribution for the species in question, or no suitable habitat (type, quality and extent) was identified as being present during the field assessment. Individuals of some species may occur occasionally as vagrants/transients especially if suitable habitat is located nearby but the site itself would not support a population or part population of the species.
- Possibly Occurs: Survey area is within the known distribution of the species in question and habitat of at least marginal quality was identified as likely to be present during the field survey and literature review, supported in some cases by recent records being documented in literature from within or near the survey area. In some cases, while a species may be classified as possibly being present at times, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

- Known to Occur: The species in question has been positively identified as being present (for sedentary species) or as using the survey area as habitat for some other purpose (for non-sedentary/mobile species) during field surveys within or near the survey area. This information may have been obtained by direct observation of individuals or by way of secondary evidence (e.g. tracks, foraging debris, scats). In some cases, while a species may be classified as known to occur, habitat may be marginal (e.g. poor quality, fragmented, limited in extent) and therefore the frequency of occurrence and/or population levels may be low.

4.5 Scientific Licences

Table 4-1: Scientific Licenses of Botanica Staff coordinating the survey

Licensed Staff	Permit Number	Date of Expiry
Jim Williams	FB62000108 (licence to take flora for scientific purposes)	27/05/2022
Jennifer Jackson	FB62000309 (Licence to take flora for scientific purposes)	11/01/2024

4.6 Survey Limitations and Constraints

It is important to note that flora surveys will entail limitations notwithstanding careful planning and design. Potential limitations are listed in Table 4-2.

The conclusions presented in this report are based upon field data and environmental assessments and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. Also, it should be recognised that site conditions can change with time. Information not available at the time of this assessment which may subsequently become available may alter the conclusions presented.

Some species are reported as potentially occurring based on there being suitable habitat (quality and extent) within the survey area or immediately adjacent. The habitat requirements and ecology of many of the species known to occur in the wider area are however often not well understood or documented. It can therefore be difficult to exclude species from the potential list based on a lack of a specific habitats or microhabitats within the survey area. As a consequence of this limitation, the potential species list produced is most likely an overestimation of those species that actually utilise the survey area for some purpose.

In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any flora species that would possibly occur within the survey area (or immediately adjacent), as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the author, has been listed as having the potential to occur.

Table 4-2: Limitations and constraints associated with the flora/ vegetation and fauna survey

Variable	Potential Impact on Survey	Details
Access problems	Not a constraint	The survey was conducted via 4WD and on foot. Numerous access tracks were present within the survey area providing ease of access.
Competency/ Experience	Not a constraint	The Botanica personnel that conducted the survey were regarded as suitably qualified and experienced. **Coordinating Staff**: Jim Williams (Botanist) **Data Interpretation**: Jim Williams (Botanist), and Kelby Jennings (Senior Environmental Consultant).
Timing of survey, weather & season	Minor constraint	Fieldwork was undertaken within the EPA's recommended survey period (September - November) for the South-West and Interzone Province. However, unfavourable climate conditions may impact the presence of flowering material and ephemeral species.
Area disturbance	Not a constraint	Although some areas are impacted by mining and exploration activity, the majority of native vegetation was intact and in good condition.
Survey Effort/ Extent	Not a constraint	Survey intensity was appropriate for the size/significance of the area with a reconnaissance flora survey and basic fauna survey completed to identify vegetation types/ fauna habitats and significant flora, fauna and vegetation.
Availability of contextual information at a regional and local scale	Not a constraint	Conservation significant flora database searches provided by the DBCA were used to identify any potential locations of Threatened/Priority flora species. BoM, DWER, DPIRD, DBCA and DAWE databases were reviewed to obtain appropriate regional desktop information on the biophysical environment of the local region. Botanica has conducted a number of surveys within Coolgardie and Murchison Bioregions and was also able to obtain information about the area from previous research conducted within the area. Results of previous assessments in the local area were reviewed to provide context on the local environment.
Completeness	Not a constraint	In the opinion of Botanica, the survey area was covered sufficiently in order to identify vegetation assemblages. All observed flora individuals were able to be identified to species level. Fieldwork was undertaken within the EPA's recommended survey period (September - November) for the South-West and Interzone Province. The vegetation associations for this study were based on visual descriptions of locations in the field. The distribution of these vegetation associations outside the survey area is not known, however vegetation associations identified were categorised via comparison to vegetation distributions throughout WA given on NVIS (DotEE, 2017).

5 RESULTS

5.1 Desktop Assessment

5.1.1 Flora

The NatureMap desktop search identified 558 vascular flora species as occurring within 40 km of the survey area, representing 304 genera from 65 families. The most diverse families were Myrtaceae (80 species), Fabaceae (66 species) and Asteraceae (55 species). The most dominant genera were *Eucalyptus* (44 species), *Acacia* (39 species) and *Eremophila* (28 species). This total includes 19 introduced (weed) species (3.4%).

5.1.1.1 Introduced Flora

The desktop review identified 20 introduced flora (weed) species, representing 12 families, as potentially occurring in the vicinity of the survey area. Of these, three are listed as a Declared Pest on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management* (BAM) *Act 2007*, with Prickly Pear cactus (*Opuntia* and *Cylindropuntia* spp.) and Common Lantana (*Lantana camara*) is also listed as a Weed of National Significance (Table 5-1).

The full list of potential weed species is contained in Appendix B.

Table 5-1: Significant introduced flora potentially occurring within 40 km of the survey area

Family	Taxon	Common Name	WAOL Status	Control Category	WONS
Boraginaceae	*Echium plantagineum*	Paterson's Curse	Declared Pest - s22(2)	No Control Category, Whole of State	No
Cactaceae	*Opuntia* and *Cylindropuntia* spp.	Prickly Pears	Declared Pest - s22(2)	C3 Management, Whole of State	Yes
Verbenaceae	*Lantana camara*	Common Lantana	Declared Pest - s22(2)	C3 Management, Whole of State	Yes

5.1.1.2 Significant Flora

The assessment of the DBCA Priority/ Threatened flora database records (DBCA, 2019), NatureMap (DBCA, 2020) and Protected Matters searches (DAWE, 2020a) and previous relevant literature identified 36 significant flora species recorded within a 40 km radius of the survey area. These consist of one Threatened, 15 Priority 1, five Priority 2, 12 Priority 3 and three Priority 4 taxa (Appendix C).

These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area. The assessment identified two taxa as previously recorded within the survey area, consisting of two Priority 1 taxa. In addition, the assessment identified four taxa as possibly occurring in the survey area, consisting of one Priority 1, one Priority 2 and two Priority 3 taxa. The full flora likelihood assessment is listed in Appendix C. The locations of the DBCA database records are illustrated spatially in Figure 5-1.

Table 5-2: Significant flora potentially occurring within the survey area

DBCA Status	Taxon	Habitat	Comments	Likelihood
P1	*Austrostipa* sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	Rocky hillslopes	Previously recorded within survey area (Botanica, 2016)	Previously Recorded
	Philotheca apiculata	Stony clay loam. Rocky outcrops, hillsides.	Previously recorded within survey area (Botanica, 2016)	Previously Recorded
	Prostanthera splendens	Stony loam, shallow soils with ironstone pebbles. Breakaways.	Records within 2km of the survey area, habitat may be present	Possible
P2	*Phebalium clavatum*	Sandy soils. Sandplains.	Records within 2km of the survey area, habitat may be present	Possible
P3	*Eremophila acutifolia*	-	Records within 2km of the survey area, habitat may be present	Possible
	Eremophila annosicaulis	Hillslopes, stony loams	Records within 2km of the survey area, habitat may be present	Possible

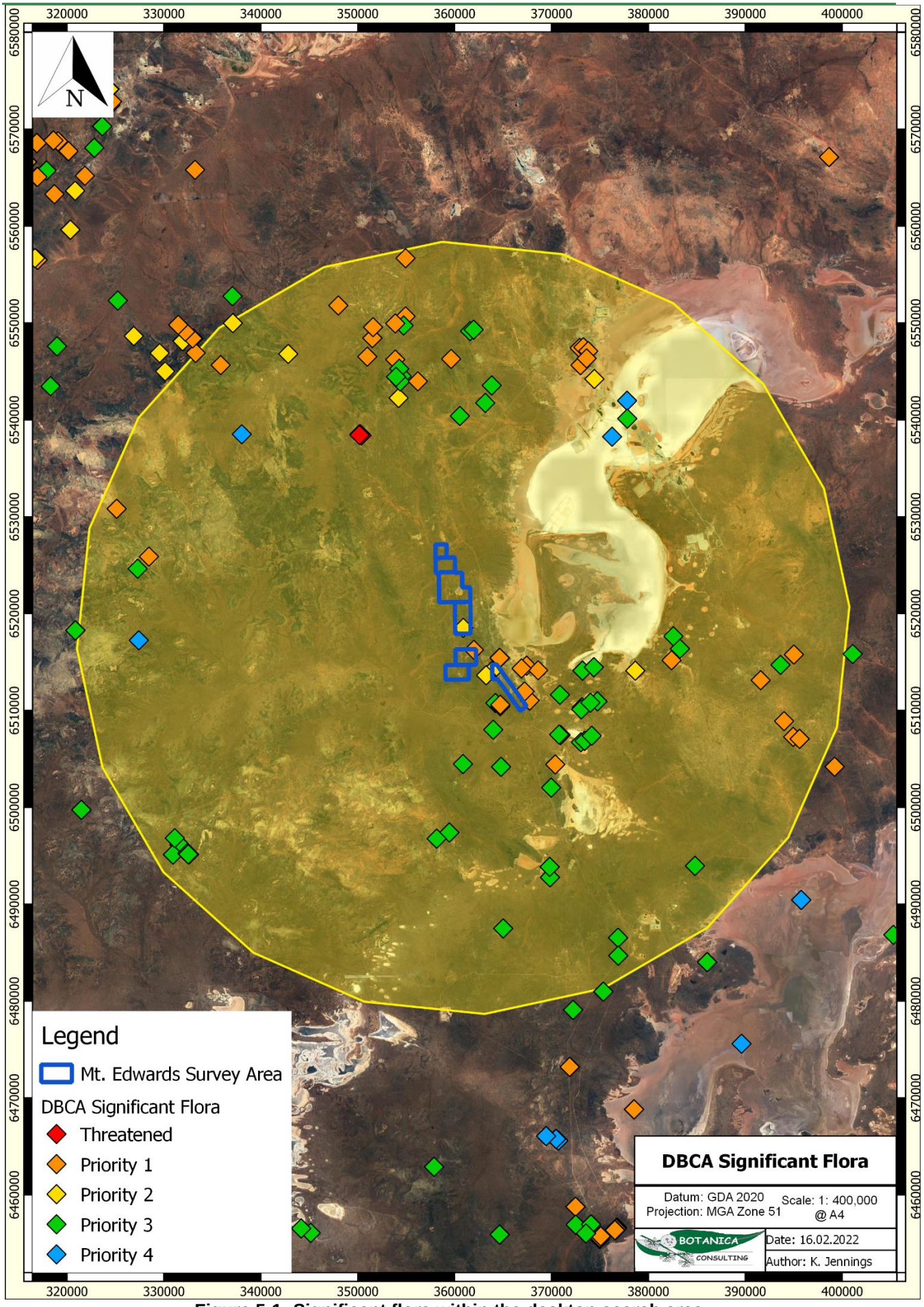

Figure 5-1: Significant flora within the desktop search area

5.1.2 Vegetation and Ecological Communities

5.1.2.1 Vegetation Associations

The Pre-European vegetation association spatial mapping dataset (DPIRD, 2018) identified two vegetation associations as occurring within the survey area (Figure 5-2). The association description and its remaining extent, as specified in the 2018 Statewide Vegetation Statistics (DBCA, 2019b) are provided in Table 5-3. Areas retaining less than 30% of their pre-European vegetation extent generally experience exponentially accelerated species loss, while areas with less than 10% are considered "endangered" (EPA, 2000). Both vegetation associations retain >98% of their pre-European extent, and development within the survey area will not significantly reduce the current extent of these vegetation associations.

Table 5-3: Pre-European vegetation associations within the survey area

Vegetation Association	Current Extent (ha)	% Pre-European extent remaining	% Protected for Conservation	Floristic Description	Extent within Survey Area
Binneringe 9	100103	98.82	2.47	Medium woodland; coral gum (Eucalyptus torquata) & goldfields blackbutt (*E. lesouefii*)	2,352 ha (78.3%)
Binneringe 936	127,819	98.48	1.04	Medium woodland; salmon gum	652 ha (21.7%)

5.1.2.2 Significant Ecological Communities

The Protected Matters search (DAWE, 2020a) did not identify any Threatened Ecological Communities recorded within 40 km of the survey area. Analysis of the Priority Ecological Communities within the Goldfields region (DBCA, 2017) did not identify any significant vegetation assemblages as likely or possibly occurring within the survey area.

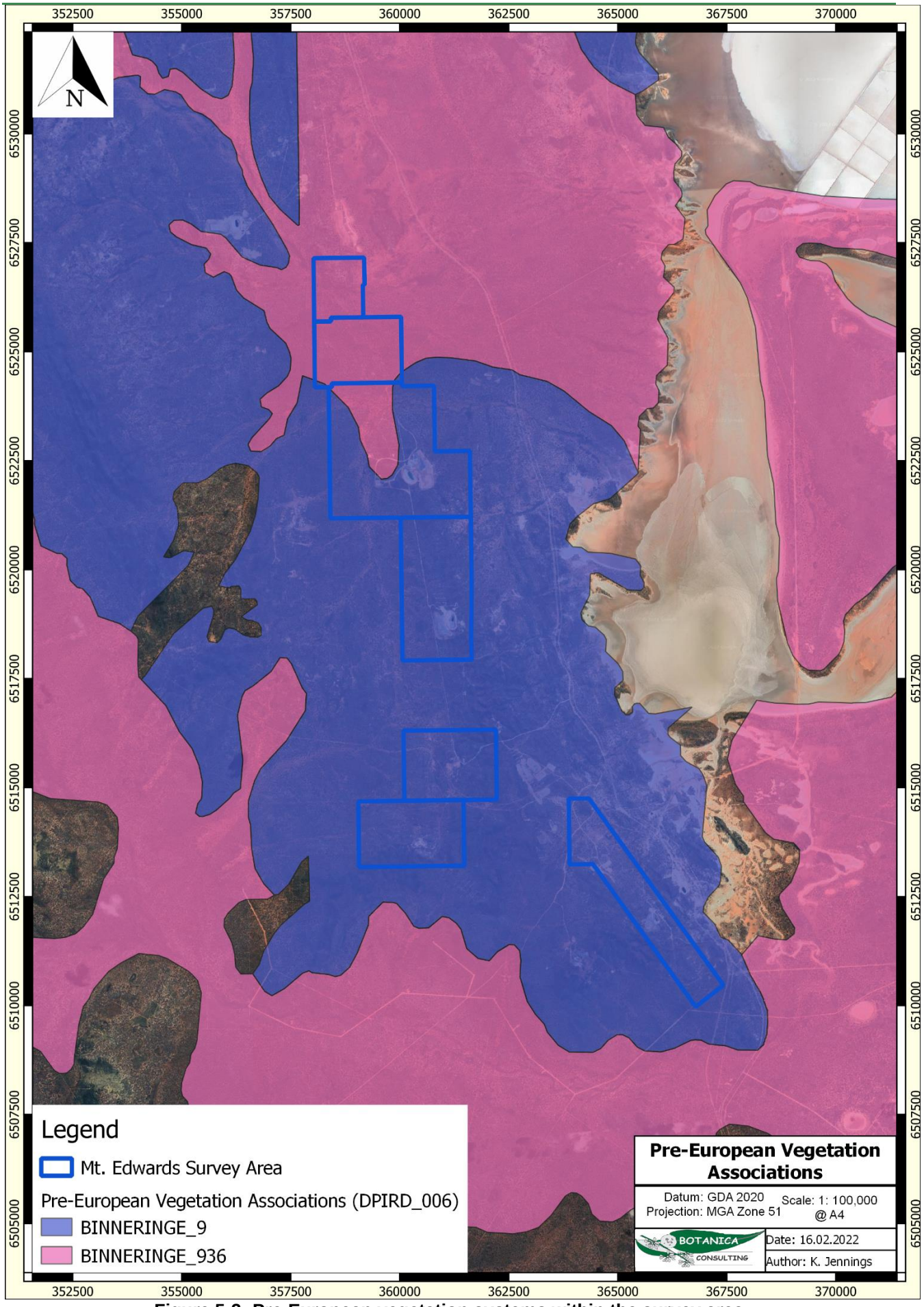

Figure 5-2: Pre-European vegetation systems within the survey area

5.1.3 Fauna

According to the results of the NatureMap search (DBCA, 2021b), a total of 191 terrestrial vertebrate fauna taxa have been recorded within 40 km of the survey area, consisting of 110 bird, 14 mammal, 65 reptile and two amphibian taxa. This total includes three introduced (feral) species (1.6%).

5.1.3.1 Introduced (Feral) Fauna

The NatureMap and EPBC database searches identified 11 feral fauna species, representing eight families, as potentially occurring in the survey area (Table 5-4).

Table 5-4: Potentially occurring introduced fauna

Family	Taxon	Common Name
Bovidae	*Capra hircus*	Goat
Camelidae	*Camelus dromedarius*	Dromedary Camel
Canidae	*Canis lupus familiaris*	Domestic Dog
	Vulpes vulpes	Red Fox
Columbidae	*Columba livia*	Domestic Pigeon
	Streptopelia senegalensis	Laughing Turtle-Dove
Equidae	*Equus asinus*	Donkey, Ass
	Equus caballus	Horse
Felidae	*Felis catus*	Cat
Leporidae	*Oryctolagus cuniculus*	Rabbit
Muridae	*Mus musculus*	House Mouse

5.1.3.2 Conservation Significant Fauna

The desktop review identified eight terrestrial vertebrate fauna species of conservation significance as previously being recorded in the regional area, consisting of four Threatened, one Priority 4 and three migratory or otherwise protected species. In addition, six migratory wading/shorebird species were assessed collectively due to their similar habitat requirements. The full fauna likelihood assessment is listed in Appendix D.

Habitat and distribution data was used to determine the likelihood of occurrence within the survey area. The assessment identified three significant fauna species as potentially occurring in the survey area, consisting of two Vulnerable and one Specially Protected taxa (Table 5-5).

Table 5-5: Potentially occurring significant fauna

Species	Conservation Status			Habitat Description	Comments	Likelihood
	EPBC Act	BC Act	DBCA Priority			
Grey Falcon *Falco hypoleucos*	VU	VU		The Grey Falcon occurs at low densities across inland Australia. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter. Prey species are predominately birds, including doves, pigeons, small parrots and cockatoos and finches, but also hunt small mammals and lizards.	Survey area may form part of larger home range but unlikely to breed in area	Possible
Malleefowl *Leipoa ocellata*	VU	VU	-	Scrublands and woodlands dominated by mallee and wattle species (DAWE, 2020b).	Habitat likely marginal and unsuitable for breeding. Occasional transients only.	Possible
Peregrine Falcon *Falco peregrinus*	-	OS	-	Found in a wide variety of habitats. Requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings (Birdlife Australia, 2018).	Survey area may form part of larger home range but unlikely to breed in area	Possible

5.2 Field Assessment

5.2.1 Flora

The field survey identified 115 vascular flora taxa within the survey area. These taxa represented 63 genera across 32 families, with the most diverse families being Chenopodiaceae and Fabaceae (14 species each), followed by Myrtaceae and Scrophulariaceae (13 species each). Dominant genera include *Eremophila* (13 species), *Eucalyptus* (11 species) and *Acacia* (nine species). Of the flora recorded, eight species (7.0%) were introduced (weed) species. The full field species inventory is listed in Appendix E.

5.2.1.1 Introduced Flora

A total of eight species of introduced flora were recorded within the survey area (Table 5-6). None of these species are listed as a Weed of National Significance or a Declared Pest in Western Australia.

Table 5-6: Introduced flora species within the survey area

Family	Taxon	Common Name
Aizoaceae	*Mesembryanthemum nodiflorum*	Slender Ice-plant
Asphodelaceae	*Asphodelus fistulosus*	Onion Weed
Asteraceae	*Centaurea melitensis*	Maltese Cockspur
	Sonchus oleraceus	Common Sowthistle
Brassicaceae	*Carrichtera annua*	Ward's Weed
Lamiaceae	*Salvia verbenaca*	Wild Sage
Solanaceae	*Solanum hoplopetalum*	Thorny Solanum
	Solanum nigrum	Black Berry Nightshade

5.2.1.2 Significant Flora

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) significant flora includes:

- flora being identified as threatened or priority species;
- locally endemic flora or flora associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- flora representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; and
- flora with relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

No Threatened flora species were recorded within the survey area.

The Priority 1 flora *Philotheca apiculata* was recorded within the survey area consisting of approximately 304 individuals over five populations. These populations were located in the Cooke, Armstrong Munda and Widgie South project areas and were all associated with the RH-EW1 vegetation community (Figure 5-3).

No other Priority or otherwise significant flora were recorded within the survey area. The Priority 1 species *Austrostipa* sp. Carlingup Road (S. Kern & R. Jasper LCH 18459), which was previously recorded in the survey area (Botanica, 2016), was not observed to be present.

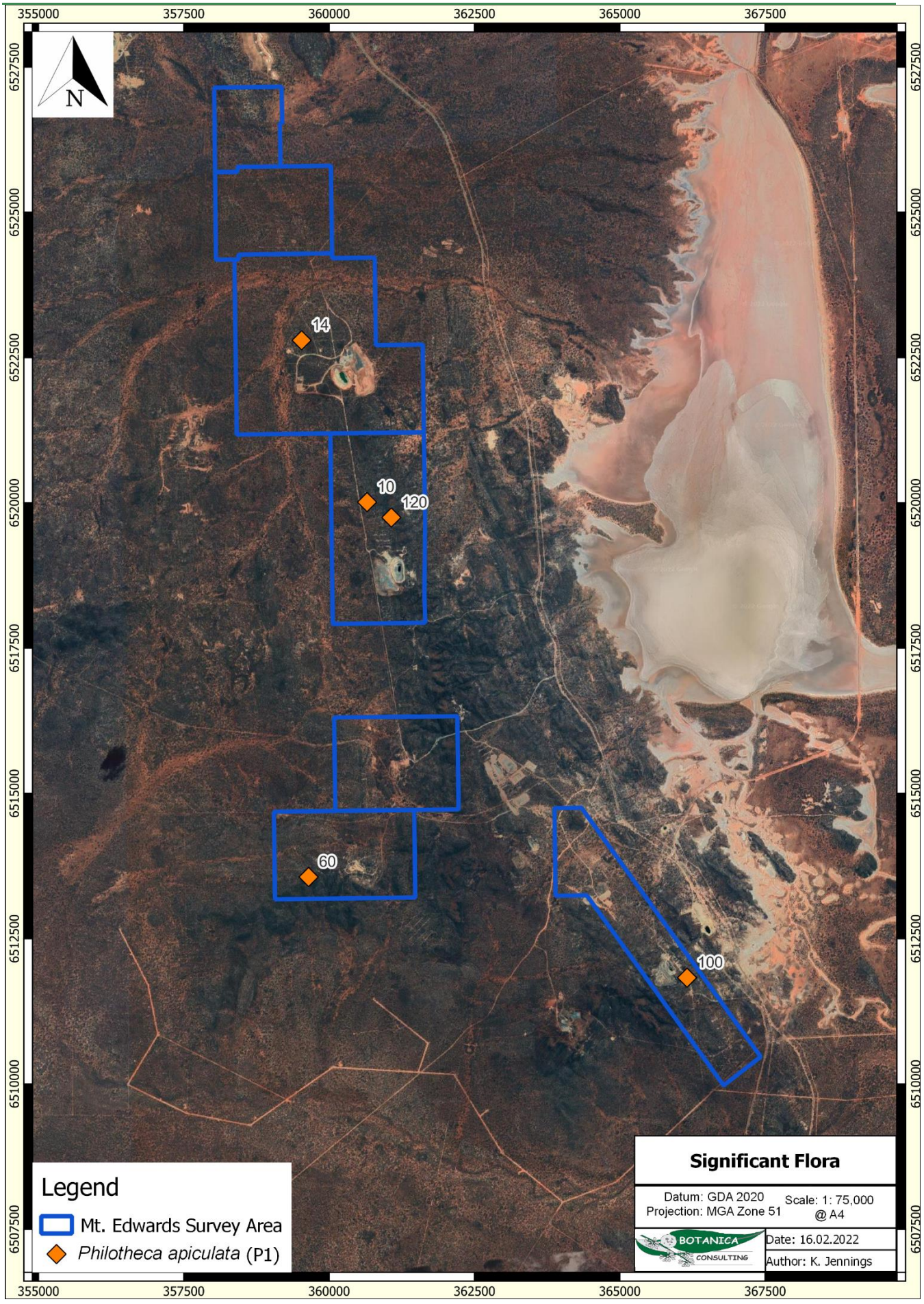

Figure 5-3: Significant flora within the survey area

5.2.2 Philotheca apiculata (P1)

Philotheca apiculata, a member of the Rutaceae family, is an erect shrub, growing between 0.5 m and 1.5 m in height. It produces white/pink flowers from August to November. It preferred habitat includes rocky outcrops and hillslopes and has been recorded in the Coolgardie, Dundas, Esperance, and Yilgarn LGA's.

Within the survey area, *Philotheca apiculata* was associated with rocky areas and breakaways within vegetation community RH-EW1, which is broadly described as 'Eucalyptus *woodlands on rocky hillslopes*' and is considered typical of its preferred habitat.


Plate 5-1 & Plate 5-2: *Philotheca apiculata* (P1) within the survey area

5.2.3 Vegetation Communities

A total of four broad-scale vegetation communities were identified within the survey area. Vegetation community descriptions and extent are listed below in Table 5-7and illustrated spatially in Figure 5-4. Vegetation community descriptions and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities. Areas cleared of vegetation, significantly degraded and/or rehabilitated were not included in the vegetation community calculations.

The survey found CLP-EW1 was the most widespread community in the survey area, occupying 1,526 ha (50.8%), while DD-EW1 was the most restricted with 44.2 ha (1.5%). The most diverse vegetation community was CLP-EW1 with 92 species (80.0%), while the least diverse were DD-EW1 and SCLP-MW1, each with 25 species (21.7%).

Table 5-7: Summary of vegetation communities within the survey area

Vegetation Code	NVIS Major Vegetation Group	Vegetation Type	Landform	Image
CLP-EW1 1,526 ha (50.8%)	*Eucalyptus* woodland	*Eucalyptus urna, E. lesouefii* and *E. transcontinentalis* woodland over *Melaleuca pauperiflora, Acacia hemiteles* and *Eremophila scoparia* shrubland over *Olearia muelleri* and mixed *Maireana* low shrubland	Clay-loam plain	
DD-EW1 44 ha (1.5%)	*Eucalyptus* open woodland	*Eucalyptus salmonophloia* open woodland over *Acacia colletioides, Eremophila interstans* subsp. *virgata* and *E. decipiens* shrubland over mixed *Maireana* low open shrubland	Drainage Depression	

Vegetation Code	NVIS Major Vegetation Group	Vegetation Type	Landform	Image
RH-EW1 1,089 ha (36.2%)	*Eucalyptus* woodland	*Eucalyptus lesouefii, E. griffithsii* and *E. torquata* open woodland over *Dodonaea lobulata, Trymalium myrtillus* subsp. *myrtillus* and *Grevillea nematophylla* open shrubland over *Westringia rigida, Olearia muelleri* and *Enchylaena tomentosa* low open shrubland	Rocky hillslope	
SCLP-MW1 198 ha (6.6%)	*Eucalyptus* low mallee woodland	*Eucalyptus griffithsii, Allocasuarina helmsii* and *Santalum spicatum* low woodland over *Trymalium myrtillus* subsp. *myrtillus, Acacia hemiteles* and *A. acuminata* shrubland over *Triodia scariosa, Westringia rigida* and *Olearia muelleri* tussock grassland/ low shrubland	Sandy clay-loam plain	

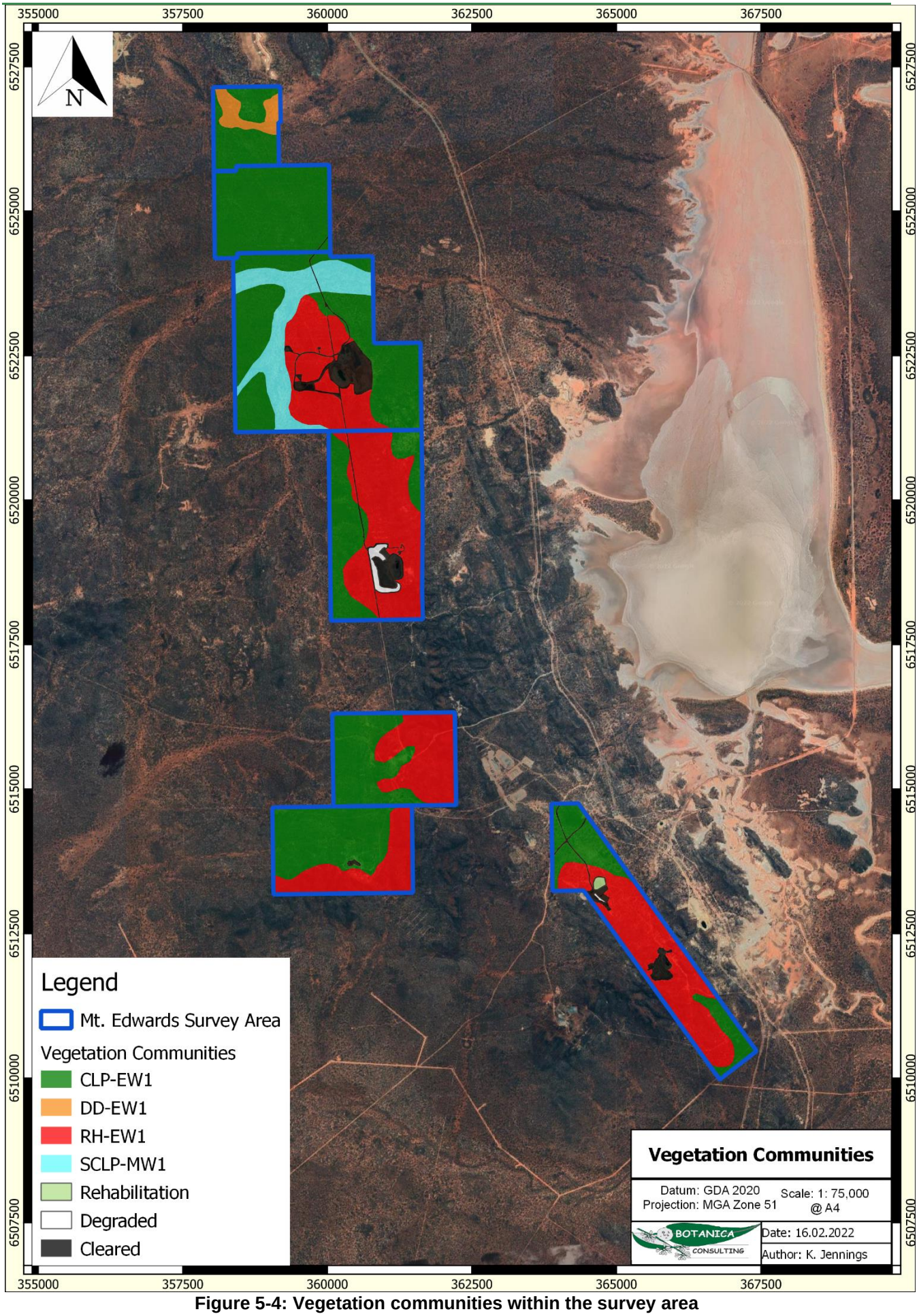

Figure 5-4: Vegetation communities within the survey area

5.2.4 Vegetation Condition

Based on the vegetation condition rating scale adapted from Keighery (1994) and Trudgen, (1988), native vegetation within the survey area ranged from 'very good to 'completely degraded'. (Table 5-8,Figure 5-5). Vegetation condition rating descriptions are listed in Appendix F. Disturbances within the survey area include mining operations, access roads and cumulative historical impacts.

Table 5-8: Vegetation condition rating within the survey area

Condition rating	Description	Area (ha)	Area (%)
Very Good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.	1,269	42.2
Good	Obvious signs of damage caused by human activity since European settlement, such as historical clearing, numerous vehicle tracks, changed fire regimes and low levels of grazing by feral animals	1,592	53.0
Degraded	High density of exploration activity, historical clearing and/ or rehabilitation	17	0.6
Completely Degraded	Mining operations and major roads	126	4.2
TOTAL		**2703**	**100**

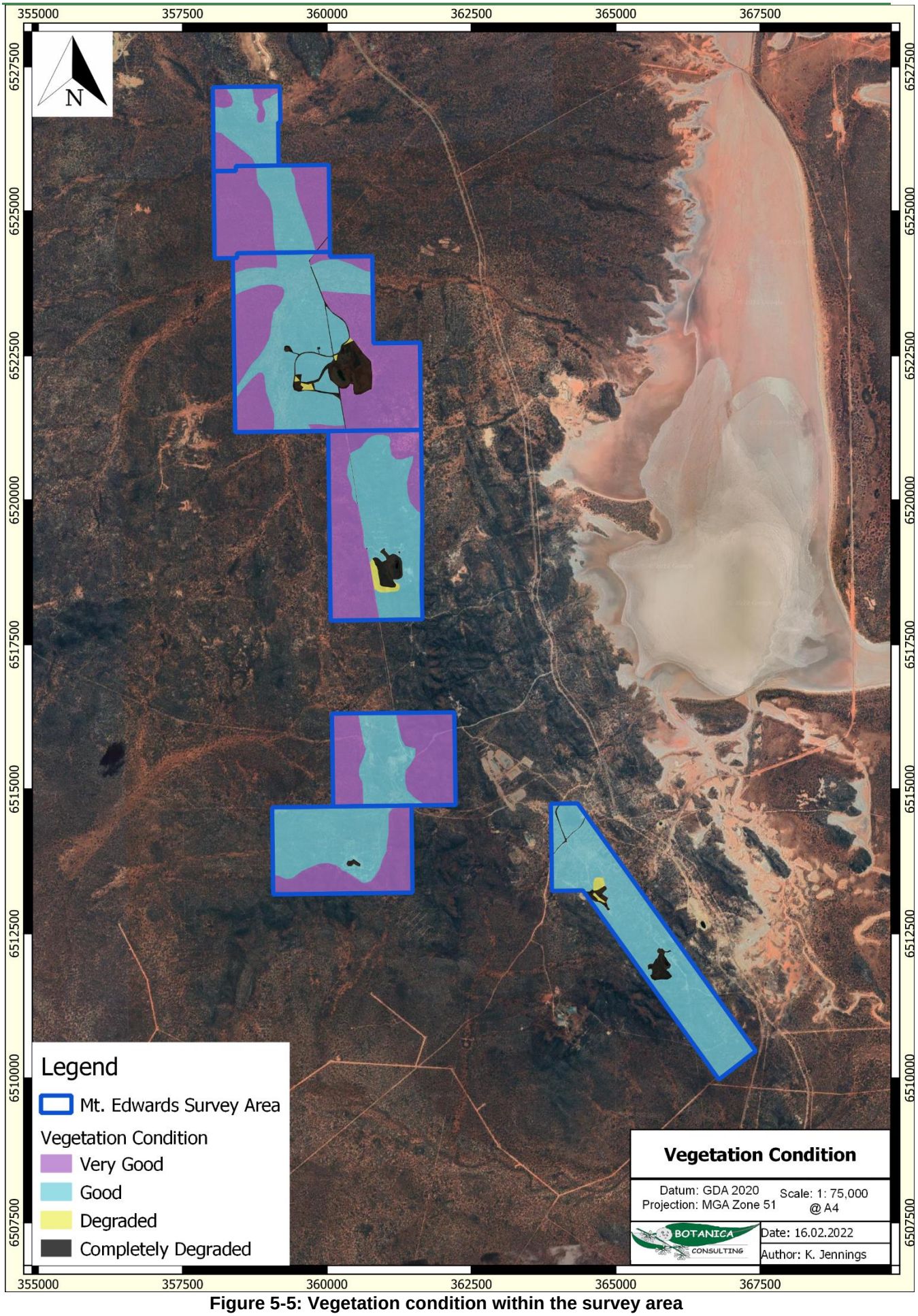

Figure 5-5: Vegetation condition within the survey area

5.2.5 Significant Vegetation

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) significant vegetation includes:

- vegetation being identified as threatened or priority ecological communities;
- vegetation with restricted distribution;
- vegetation subject to a high degree of historical impact from threatening processes;
- vegetation which provides a role as a refuge; and
- vegetation providing an important function required to maintain ecological integrity of a significant ecosystem.

No Threatened, Priority or otherwise significant ecological communities were identified within the survey area.

5.2.6 Fauna Habitat

Based on vegetation and associated landforms assessed during the flora and vegetation assessment, four broad scale terrestrial fauna habitats were identified as occurring within the survey area. Table 4-7 provides the area and a visual representation of fauna habitat types, and the extent of fauna habitats is shown spatially in Figure 5-6.

Table 5-9: Main terrestrial fauna habitats within the survey area

Fauna Habitat	Description	Representative Fauna Attributes	Significant species that possibly occur in habitat	Example Image
Eucalyptus woodland on clay-loam plain Area= 1,526 ha (50.8%)	*Eucalyptus* and *Melaleuca* open woodland over *Acacia* and *Eremophila* shrubland over mixed low shrubland	• Ground not especially suited to burrowing species. • Moderately diverse vegetation strata supporting diverse avifauna assemblage. • Moderately dense vegetation and moderate leaf litter.	Malleefowl *Leipoa ocellata* Grey Falcon *Falco hypoleucos* Peregrine Falcon *Falco peregrinus*	
Eucalyptus open woodland in drainage depression Area= 44 ha (1.5%)	*Eucalyptus* open mallee woodland over *Acacia* and *Eremophila* shrubland over mixed low shrubland	• Ground not especially suited to burrowing species. • Moderately diverse vegetation strata supporting diverse avifauna assemblage. • Low to moderately dense vegetation and low leaf litter.	Malleefowl *Leipoa ocellata*	

Fauna Habitat	Description	Representative Fauna Attributes	Significant species that possibly occur in habitat	Example Image
Eucalyptus woodland on rocky hillslope Area= 1,089 ha (36.2%)	*Eucalyptus* woodland over *Dodonaea* and *Tymalium* shrubland over mixed low shrubland	• Ground not especially suited to burrowing species. • Rocky landscape offers refuge for reptile fauna. • Moderately diverse vegetation strata supporting diverse avifauna assemblage. • Low to moderately dense vegetation and moderate leaf litter.	Malleefowl *Leipoa ocellata* Grey Falcon *Falco hypoleucos* Peregrine Falcon *Falco peregrinus*	
Eucalyptus mallee woodland on sandy clay-loam plain Area= 198 ha (6.6%)	*Eucalyptus* mallee woodland over *Acacia* and *Tymalium* shrubland over *Triodia* gtussock grassland/ mixed low shrubland	• Ground not especially suited to burrowing species. • Moderately diverse vegetation strata supporting diverse avifauna assemblage. • Low to moderately dense vegetation and moderate leaf litter.	Malleefowl *Leipoa ocellata* Grey Falcon *Falco hypoleucos*	

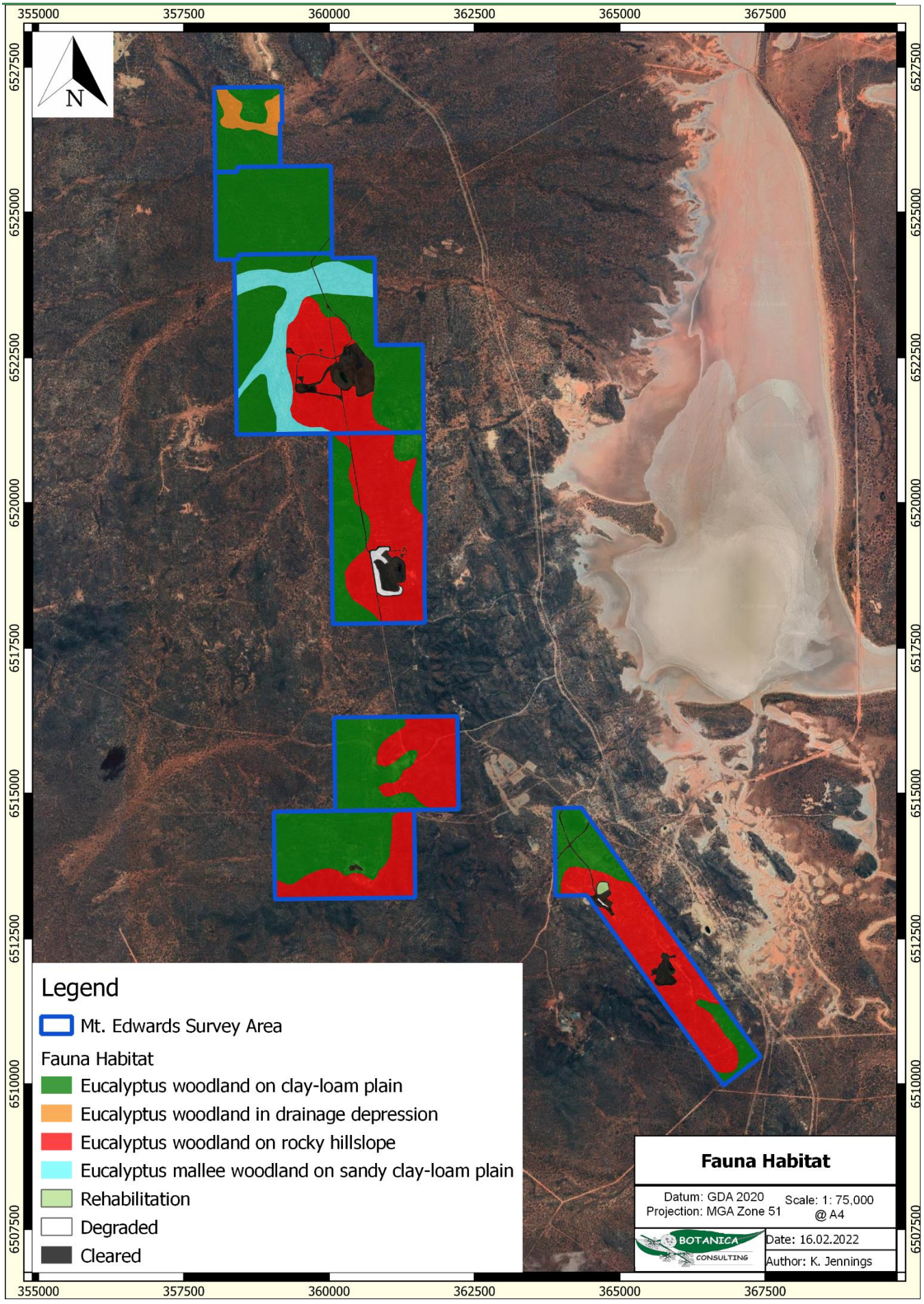

Figure 5-6: Fauna habitats within the survey area

5.2.7 Significant Fauna

According to the EPA *Environmental Factor Guideline for Terrestrial Fauna* (EPA, 2016c) significant fauna includes:

- Fauna being identified as a Threatened or Priority species;
- Fauna species with restricted distribution;
- Fauna subject to a high degree of historical impact from threatening processes; and
- Fauna providing an important function required to maintain the ecological integrity of a significant ecosystem.

No evidence of significant fauna species were observed during the field survey.

The current status of some species on site and/or in the general area is difficult to determine, however, based on the habitats present and, in some cases, direct observations or recent nearby records, the following species of conservation significance can be regarded as possibly utilising the survey area for some purpose at times, these being:

- **Malleefowl (*Leipoa ocellata)* - Vulnerable (EPBC Act and BC Act)**

This species is occasionally recorded in the Eastern Goldfields subregion. Habitat appears marginal/or unsuitable for breeding due to the open nature of the vegetation. No evidence of current or recent malleefowl activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the survey area. Significant impact unlikely.

- **Grey Falcon (*Falco hypoleucos)* - Vulnerable (EPBC Act and BC Act)**

This species is sparsely recorded throughout inland Australia. Suitable habitat may be present but in unlikely to represent critical habitat. Significant impact unlikely.

- **Peregrine Falcon (*Falco peregrinus)* – Specially Protected (EPBC Act)**

This species potentially utilises some sections of the survey area as part of a much larger home range, though records in this area are uncommon. It is considered unlikely to breed within the survey area. Significant impact unlikely.

It should be noted that while habitats onsite for one or more of the species listed above are considered possibly suitable, some or all may be marginal in extent/quality and therefore the fauna species considered as possibly occurring may in fact only visit the area for short periods as infrequent vagrants.

5.3 Matters of National Environmental Significance

5.3.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act protects matters of national environmental significance and is used by the Commonwealth DAWE to list threatened taxa and ecological communities into categories based on the criteria set out in the Act (www.environment.gov.au/epbc/index.html). The Act provides a national environmental assessment and approval system for proposed developments and enforces strict penalties for unauthorised actions that may affect matters of national environmental significance. Matters of national environmental significance as defined by the Commonwealth EPBC Act include:

- Nationally threatened flora and fauna species;
- World heritage properties;
- National heritage places;
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed);
- Nationally threatened ecological communities;
- Commonwealth marine area;
- The Great Barrier Reef Marine Park; and
- Nuclear actions (including uranium mining) a water resource, in relation to coal seam gas development and large coal mining development.

No matters of national environmental significance as defined by the Commonwealth EPBC Act were identified within the survey area.

5.4 Matters of State Environmental Significance

5.4.1 *Environmental Protection Act WA 1986*

The EP Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment. The Act is administered by The Department of Water and Environment Regulation (DWER), which is the State Government's environmental regulatory agency.

Under Section 51C of the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations (Regulations) WA 2004* any clearing of native vegetation in Western Australia that is not eligible for exemption under Schedule 6 of the *EP Act 1986* or under the Regulations 2004 requires a clearing permit from the DWER or DMIRS. Under Section 51A of the *EP Act 1986* native vegetation includes aquatic and terrestrial vegetation indigenous to Western Australia, and intentionally planted vegetation declared by regulation to be native vegetation, but not vegetation planted in a plantation or planted with commercial intent. Section 51A of the *EP Act 1986* defines clearing as "the killing or destruction of; the removal of; the severing or ringbarking of trunks or stems of; or the doing of substantial damage to some or all of the native vegetation in an area, including the flooding of land, the burning of vegetation, the grazing of stock or an act or activity that results in the above". Exemptions under Schedule 6 of the EP Act and the EP Regulations do not apply in ESAs as declared under Section 51B of the EP Act or TEC listed under State and Commonwealth legislation.

No evidence of the survey area containing any TEC or Threatened flora or fauna was found during the survey period. The survey area is not located within an ESA.

5.4.2 *Biodiversity Conservation Act 2016*

This Act is used by the Western Australian DBCA for the conservation and protection of biodiversity and biodiversity components in Western Australia and to promote the ecologically sustainable use of biodiversity components in the State. Taxa are classified as 'Threatened" when their populations are geographically restricted or are threatened by local processes (see following sections for Threatened definitions). Under this Act all native flora and fauna are protected throughout the State. Financial penalties are enforced under this Act if threatened species are collected without an appropriate license.

Under Section 54(1) of the BC Act, habitat is eligible for listing as critical habitat if:

a) it is critical to the survival of a threatened species or a threatened ecological community; and
b) its listing is otherwise in accordance with the ministerial guidelines.

No threatened species or critical habitat listed under the BC Act were recorded within the survey area.

5.5 Other areas of Conservation Significance

The DBCA lists 'Priority' species and communities which are under consideration for declaration as 'Threatened' under the BC Act. These Priority species/ communities have no formal legal protection until they are endorsed by the Minister as being Threatened.

The Priority 1 flora *Philotheca apiculata* was recorded within the survey area. No other Priority flora species were recorded.

No Priority ecological communities, as listed by the DBCA, were identified within the survey area.

No Environmentally Sensitive Areas were identified within the survey area.

There are no wetlands of international importance (Ramsar Wetlands) or national importance (Australian Nature Conservation Agency Wetlands) within the survey area.

There are no proposed or gazetted conservation reserves within the survey area. Both proposed and gazetted conservation reserves are managed by DBCA with gazetted conservation reserves vested with the Conservation and Parks Commission of Western Australia. The Conservation and Parks Commission is an independent statutory authority that was established under the Conservation and Land Management (CALM) Act 1984 in November 2000 and is the controlling body in which the State's conservation estate, including national parks, conservation parks, nature reserves, state forests and timber reserves, are vested. The Conservation and Parks Commission develops policies and provides independent advice to the Minister for Environment with respect to conservation, the management of ecological biodiversity and the application of ecologically sustainable forest management. The DBCA manages land on behalf of the Conservation and Parks Commission.

The closest significant environmental feature is the Dordie Rocks Nature Reserve, which is DBCA-managed land located approximately 6 km south of the Widgie South portion of the survey area. Disturbances within the survey area are unlikely to impact this area. The location of proposed and vested Conservation Reserves, ESA's and Nationally Important Wetlands in relation to the survey area is provided in Figure 4 3.

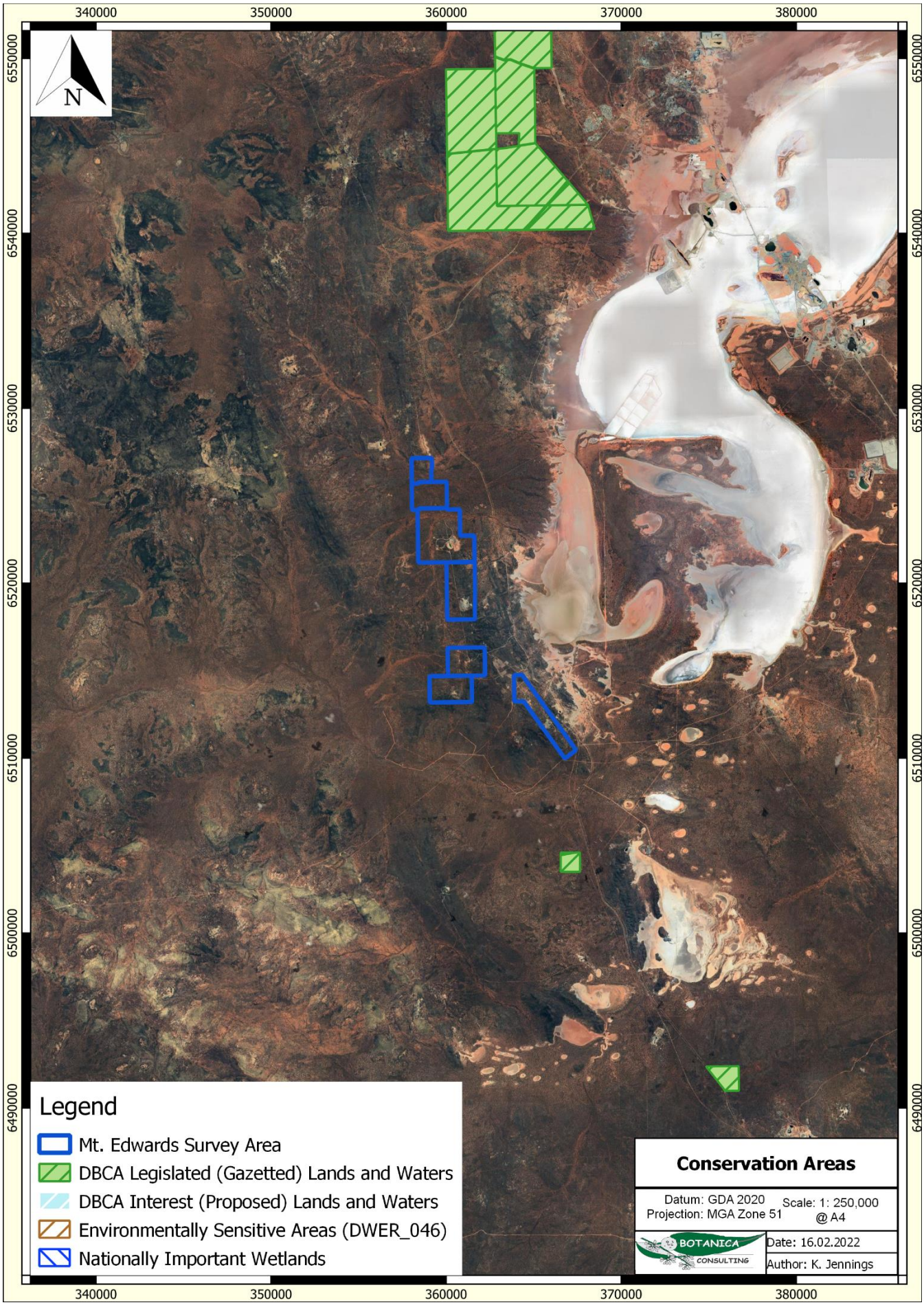

Figure 5-7: Areas of conservation significance

5.6 Native Vegetation Clearing Principles

Based on the outcomes from the survey undertaken, Botanica assessed the results of the desktop and field survey with regards to the native vegetation clearing principles listed under Schedule 5 of the EP Act (

Table 5-10). The assessment found that the proposed vegetation clearing activities may be at variance with clearing principles (f) and (i).

Table 5-10: Assessment against native vegetation clearing principles

Letter	Principle	Assessment	Outcome
Native vegetation should not be cleared if it:			
(a)	comprises a high level of biological diversity.	Vegetation within the survey area is considered to be of low biological diversity and is well represented outside of the survey area. There are no Threatened or Priority Ecological Communities within the survey area.	Clearing is unlikely to be at variance with this principle
(b)	comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to WA.	The basic fauna search did not record any evidence for the presence of significant fauna or habitat within the survey area.	Clearing is unlikely to be at variance with this principle
(c)	includes, or is necessary for the continued existence of rare flora.	No Threatened Flora taxa, pursuant to the BC Act and the EPBC Act were identified within the survey area.	Clearing is unlikely to be at variance with this principle
(d)	comprises the whole or part of or is necessary for the maintenance of a threatened ecological community (TEC).	No TEC listed under the EPBC Act or by the BC Act occur within the survey area or the Eastern Goldfields subregion.	Clearing is not at variance with this principle
(e)	is significant as a remnant of native vegetation in an area that has been extensively cleared	All vegetation associations retain >98% of their original pre-European vegetation extent.	Clearing is unlikely to be at variance with this principle
(f)	is growing, in, or in association with, an environment associated with a watercourse or wetland	Several ephemeral drainage lines were identified within the survey area.	Clearing may be at variance with this principle
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The survey area and surrounding region has not been extensively cleared. Clearing within the survey area is not considered likely to lead to land degradation issues such as salinity, water logging or acidic soils.	Clearing is unlikely to be at variance with this principle
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The survey area is not located within or adjacent to conservation areas, Environmentally Sensitive Areas or Nationally Important Wetlands.	Clearing is unlikely to be at variance with this principle
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	There are several ephemeral drainage lines within the survey area, and a moderate-potential terrestrial GDE occurs over the whole of the survey area.	Clearing may be at variance with this principle
(j)	Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	Rainfall in the Eastern Goldfields subregion has an average rainfall of 200-300mm and an evaporation rate of 2400 mm. Rainfall data for Kalgoorlie-Boulder indicates that rainfall is spread throughout the year and rainfall events are unlikely to result in localised flooding. Clearing within the survey area	Clearing is unlikely to be at variance with this principle

Letter	Principle	Assessment	Outcome
Native vegetation should not be cleared if it:			
		is not likely to increase the incidence or intensity of flooding within the survey area or surrounds.	

6 BIBLIOGRAPHY

Atlas of Living Australia (2021): *Species Profiles*, viewed 30/10/2021

Beard, J.S., (1990). *Plant Life of Western Australia*, Kangaroo Press Pty Ltd, NSW.

BoM, (2021a). *Climate Data*. Bureau of Meteorology, available: http://www.bom.gov.au/climate

BoM (2021b). *Groundwater Dependent Ecosystems Atlas*. Bureau of Meteorology. Available: http://www.bom.gov.au/water/groundwater/gde/map.shtml

Botanica Consulting Pty Ltd. (2016). *Flora and Fauna Assessment Widgiemooltha Project*. Unpublished report prepared on behalf of Mincor Resources N.L., December 2016

Botanica Consulting Pty Ltd. (2020). *Reconnaissance Flora/ Vegetation Survey and Basic Fauna Survey Lake Lefroy/ Lake Fore*. Unpublished report prepared on behalf of Mincor Resources N.L., August 2020

Cowan, M. (2001). *A Biodiversity Audit of Western Australia's 53 Biogeographical Region in 2001; Coolgardie 3 (COO3 –Eastern Goldfield subregion)* pp 156-169, Department of Conservation and Land Management, August 2001DAFWA (2014). Soil Landscape System of Western Australia, Department of Agriculture and Food Western Australia

DAWE (2021a). *Protected Matters Search Tool*, Environment Protection and Biodiversity Conservation Act 1999, Department of Agriculture, Water and Environment, Australian Government.

AWE (2021b). *Species Profile and Threats Database*. Department of Agriculture, Water and Environment, Australian Government.

DBCA (2019a). *Priority/ Threatened Flora Database Search*. Obtained from Department of Biodiversity, Conservation and Attractions

DBCA (2019b). *2018 Statewide Vegetation Statistics (formerly the CAR Reserve Analysis).* Department of Biodiversity, Conservation and Attractions.

DBCA (2021a). *Priority Ecological Communities for Western Australia Version 31*, Species and Community Branch, June 2021.

DBCA (2021b). *NatureMap Database search*, Department of Biodiversity, Conservation and Attractions.

DBCA. (2020). *Guideline for the survey of arid bronze azure butterfly (ABAB) in Western Australia*. Perth, WA.

DotEE (2012). *Interim Biogeographic Regionalisation for Australia (IBRA),* Version 7, Department of the Environment and Energy.

DotEE (2017). *National Vegetation Information System (NVIS) Major Vegetation Groups, Version 4.2*, Department of the Environment and Energy.

DPIRD (2019). *Pre-European Vegetation (DPIRD_006)* Department of Primary Industries and Regional Development, Western Australia, 24 July 2019

DPIRD (2020). *Declared Organism database search,* Department of Primary Industries and Regional Development, Western Australia. Available: http://www.biosecurity.wa.gov.au/

EPA, (2000). *Position Statement No. 2 Environmental Protection of Native Vegetation in Western Australia,* Environmental Protection Authority

EPA (2016a). *Technical Guide - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016.* Environmental Protection Authority.

EPA (2016b). *Environmental Factor Guideline for Flora and Vegetation – December 2016.* Environmental Protection Authority.

EPA (2020). *Technical Guide – Terrestrial Fauna Surveys for Environmental Impact Assessment – June 2020.* Environmental Protection Authority.

Geoscience Australia (2015). *Surface Hydrology GIS*. Australian Government.

Government of Western Australia (2019). *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis. (Full Report).* Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth.
Available: https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics
Accessed: 3rd December 2021.

Government of Western Australia, (2019): *Soil Landscape Mapping – Systems (DPIRD-064)*, mapping shapefiles obtained from data.wa.gov.au, last updated June 27, 2019

Keighery, B. J., (1994). *Bushland Plant Survey: A guide to plant community survey for the community.* Wildflower Society of Western Australia (Inc.), Nedlands.

Tille, P. (2006). *Soil Landscapes of Western Australia's Rangelands and Arid Interior*, Department of Agriculture and Food Western Australia

APPENDIX A: CONSERVATION RATINGS BC ACT AND EPBC ACT

Definitions of Conservation Significant Species

Code	Category
State categories of Threatened and Priority species	
Threatened Species (T) Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as Threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act).	
CR	**Critically Endangered** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	**Endangered** Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.
VU	**Vulnerable** Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.
Extinct species Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.	
EX	**Extinct** Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.
EW	**Extinct in the Wild** Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no Threatened fauna or Threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.	
IA	**International Agreement/ Migratory** Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Code	Category
	Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
CD	**Species of special conservation interest** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as Threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
OS	**Other specially protected species** Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
Priority species Possibly Threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of Priority for survey and evaluation of conservation status so that consideration can be given to their declaration as Threatened Fauna or Flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.	
P1	**Priority 1: Poorly-known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	**Priority 2: Poorly-known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	**Priority 3: Poorly-known species** Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	**Priority 4: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
Commonwealth categories of Threatened species	
EX	**Extinct** Taxa where there is no reasonable doubt that the last member of the species has died.
EW	**Extinct in the Wild** Taxa where it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CR	**Critically Endangered**

Code	Category
	Taxa that are facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
EN	**Endangered** Taxa which are not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
VU	**Vulnerable** Taxa which are not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** Taxa which are the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Definitions of conservation significant communities

Category Code	Category
State categories of Threatened Ecological Communities (TEC)	
PD	**Presumed Totally Destroyed**
	An ecological community will be listed as Presumed Totally Destroyed if there are no recent records of the community being extant and either of the following applies:
	• records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;
	• all occurrences recorded within the last 50 years have since been destroyed.
CR	**Critically Endangered**
	An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting any one of the following criteria:
	The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;
	The ecological community is highly modified with potential of being rehabilitated in the immediate future.
EN	**Endangered**
	An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. The ecological community must meet any one of the following criteria:
	The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short-term future, or is unlikely to be substantially rehabilitated in the short-term future due to modification;
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;
	The ecological community is highly modified with potential of being rehabilitated in the short-term future.
VU	**Vulnerable**
	An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria:

Category Code	Category
	The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;
	The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution;
	The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.
Commonwealth categories of Threatened Ecological Communities (TEC)	
CE	**Critically Endangered** If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).
EN	**Endangered** If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).
VU	**Vulnerable** If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).
Priority Ecological Communities	
P1	**Poorly-known ecological communities**
	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist.
P2	**Poorly-known ecological communities**
	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, un-allocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation.
P3	**Poorly known ecological communities**
	Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
	Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;
	Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes.
P4	**Ecological communities that are adequately known, rare but not threatened** or meet criteria for near threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
P5	**Conservation Dependent ecological communities**
	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

APPENDIX B: POTENTIALLY OCCURRING INTRODUCED (WEED) FLORA SPECIES

Family	Taxon	Common Name	WAOL Status	Control Category	WONS
Asteraceae	*Centaurea melitensis*	Maltese Cockspur	Permitted - s11	No Control Category	No
	Gazania linearis	Gazania	Permitted - s11	No Control Category	No
	Hypochaeris glabra	Smooth Cats-ear	Permitted - s11	No Control Category	No
	Oligocarpus calendulaceus	-	Permitted - s11	No Control Category	No
	Oncosiphon suffruticosum	Calomba Daisy	Permitted - s11	No Control Category	No
	Sonchus oleraceus	Common Sowthistle	Permitted - s11	No Control Category	No
Boraginaceae	*Echium plantagineum*	Paterson's Curse	Declared Pest - s22(2)	No Control Category, Whole of State	No
Brassicaceae	*Brassica rapa*	-	Permitted - s11	No Control Category	No
	Carrichtera annua	Ward's Weed	Permitted - s11	No Control Category	No
	Lepidium africanum	Rubble Peppercress	Permitted - s11	No Control Category	No
	Sisymbrium erysimoides	Smooth Mustard	Permitted - s11	No Control Category	No
Cactaceae	*Opuntia* and *Cylindropuntia* spp.	Prickly Pears	Declared Pest - s22(2)	C3 Management, Whole of State	Yes
Crassulaceae	*Bryophyllum delagoense*	-	Permitted - s11	No Control Category	No
Cucurbitaceae	*Citrullus amarus*	-	Permitted - s11	No Control Category	No
Lamiaceae	*Salvia verbenaca*	Wild Sage	Permitted - s11	No Control Category	No
Orobanchaceae	*Parentucellia latifolia*	Common Bartsia	Permitted - s11	No Control Category	No
Poaceae	*Briza minor*	Shivery Grass	Permitted - s11	No Control Category	No
Primulaceae	*Lysimachia arvensis*	Pimpernel	Permitted - s11	No Control Category	No
Solanaceae	*Nicotiana glauca*	Tree Tobacco	Permitted - s11	No Control Category	No
Verbenaceae	*Lantana camara*	Common Lantana	Declared Pest - s22(2)	C3 Management, Whole of State	Yes

APPENDIX C: SIGNIFICANT FLORA LIKELIHOOD ASSESSMENT

Status			Taxon	Habitat	Comments	Likelihood
EPBC Act	BC Act	DBCA				
-	VU	-	*Tetratheca spenceri*	Hillslopes, breakaways	Outside known range of species	Unlikely
-	-	P1	*Acacia websteri*	Red sand, clay or loam. Low-lying areas, flats.	Outside known range of species	Unlikely
-	-	P1	*Austrostipa* sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	Rocky hillslopes	Previously recorded within survey area	Previously Recorded
-	-	P1	*Calandrinia lefroyensis*	Saline flats. Red sandy loam soil.	Within known range, habitat unlikely to be present	Unlikely
-	-	P1	*Cyathostemon divaricatus*	Rocky hillslopes	Outside known range of species	Unlikely
-	-	P1	*Eremophila perglandulosa*	-	Outside known range of species	Unlikely
-	-	P1	*Grevillea phillipsiana*	Red sand, stony loam. Granite hills.	Outside known range of species	Unlikely
-	-	P1	*Lepidosperma* sp. Parker Range (N. Gibson & M. Lyons 2094)	Ridges, breakaways	Outside known range of species	Unlikely
-	-	P1	*Philotheca apiculata*	Stony clay loam. Rocky outcrops, hillsides.	Previously recorded within survey area	Previously Recorded
-	-	P1	*Prostanthera splendens*	Stony loam, shallow soils with ironstone pebbles. Breakaways.	Records within 2km of the survey area, habitat may be present	Possible
-	-	P1	*Ptilotus rigidus*	Quartz hillslopes	Outside known range of species	Unlikely
-	-	P1	*Ricinocarpos digynus*	Rocky hillslopes	Outside known range of species	Unlikely
-	-	P1	*Tecticornia flabelliformis*	Clay. Saline flats.	Within known range, habitat unlikely to be present	Unlikely
-	-	P1	*Tecticornia mellarium*	-	Outside known range of species	Unlikely
-	-	P1	*Thryptomene planiflora*	-	Outside known range of species	Unlikely
-	-	P2	*Acacia kerryana*	Granitic loamy sand, stony clayey loam or clayey sand. Low stony ridges, undulating plains.	Outside known range of species	Unlikely
-	-	P2	*Bossiaea laxa*	Brown loam over deep granite. Sheltered positions around outcrops.	Outside known range of species	Unlikely
-	-	P2	*Eremophila praecox*	Red/brown sandy loam. Undulating plains.	Outside known range of species	Unlikely
-	-	P2	*Goodenia corralina*	Brown loam, granite. Near large outcrop.	Outside known range of species	Unlikely
-	-	P2	*Phebalium clavatum*	Sandy soils. Sandplains.	Records within 2km of the survey area, habitat may be present	Possible
-	-	P2	*Trachymene pyrophila*	Yellow or orange sand. Sandplains; germinating after fire or other disturbances such as mining.	Outside known range of species	Unlikely
-	-	P3	*Allocasuarina eriochlamys* subsp. *grossa*	Stony loam, laterite clay. Granite outcrops.	Within known range, habitat unlikely to be present	Unlikely
-	-	P3	*Austrostipa blackii*	-	Widespread, scattered range	Unlikely
-	-	P3	*Chrysocephalum apiculatum* subsp. *norsemanense*	Red sandy soils	Within known range, habitat unlikely to be present	Unlikely
-	-	P3	*Eremophila acutifolia*	-	Records within 2km of the survey area, habitat may be present	Possible

Status			Taxon	Habitat	Comments	Likelihood
EPBC Act	BC Act	DBCA				
-	-	P3	*Eremophila annosicaulis*	Hillslopes, stoney loams		Possible
-	-	P3	*Grevillea petrophiloides* subsp. *remota*	Loamy sand, granite. Base of outcrops, crevices.	Outside known range of species	Unlikely
-	-	P3	*Melaleuca coccinea*	Sandy loam over granite. Granite outcrops, sandplain, river valleys.	Within known range, habitat unlikely to be present	Unlikely
-	-	P3	*Melaleuca macronychia* subsp. *trygonoides*	Sandy soils. Granite outcrops.	Outside known range of species	Unlikely
-	-	P3	*Phlegmatospermum eremaeum*	Stony loam.	Widespread, scattered range	Unlikely
-	-	P3	*Pityrodia scabra* subsp. *dendrotricha*	Yellow sands. Plains, lake edges	Outside known range of species	Unlikely
-	-	P3	*Stylidium choreanthum*	White/yellow or red sand. Plains.	Outside known range of species	Unlikely
-	-	P3	*Styphelia rectiloba*	Ridges, breakaways	Outside known range of species	Unlikely
-	-	P4	*Eremophila caerulea* subsp. *merrallii*	Sand, clay or loam. Undulating plains.	Outside known range of species	Unlikely
-	-	P4	*Eucalyptus x brachyphylla*	Sandy loam. Granite outcrops.	Outside known range of species	Unlikely
-	-	P4	*Sowerbaea multicaulis*	Yellow-brown sand.	Outside known range of species	Unlikely

APPENDIX D: SIGNIFICANT FAUNA LIKELIHOOD ASSESSMENT

Species	Conservation Status			Habitat Description	Comments	Likelihood
	EPBC Act	BC Act	DBCA Priority			
Night Parrot *Pezoporus occidentalis*	EN	CR	-	Most habitat records are of Triodia (Spinifex) grasslands and/or chenopod shrublands in the arid and semi-arid zones, or *Astrebla* spp. (Mitchell grass), shrubby samphire and chenopod associations, scattered trees and shrubs, *Acacia aneura* (Mulga) woodland, treeless areas and bare gibber are associated with sightings of the species. Roosting and nesting sites are consistently reported as within clumps of dense vegetation, primarily old and large Spinifex (*Triodia*) clumps, but sometimes other vegetation types (DAWE, 2020b).	Outside known range, no suitable habitat expected to occur.	Unlikely
Grey Falcon *Falco hypoleucos*	VU	VU		The Grey Falcon occurs at low densities across inland Australia. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter. While breeding Grey Falcons feed almost exclusively on birds. Prey species include doves, pigeons, small parrots and cockatoos and finches, but a variety of other bird prey species has been recorded. Nonavian prey recorded by direct observation include small mammals and lizards.	Survey area may form part of larger home range but unlikely to breed in area	Possible
Malleefowl *Leipoa ocellata*	VU	VU	-	Scrublands and woodlands dominated by mallee and wattle species (DAWE, 2020b).	Habitat likely marginal and unsuitable for breeding. Occasional transients only.	Possible
Fork-tailed Swift *Apus pacificus*	MI	-	-	Low to very high airspace over varied habitat from rainforest to semi desert (Birdlife Australia, 2019).	Very occasional transients only.	Unlikely
Grey Wagtail *Motacilla cinerea*	MI	-	-	Running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields (Morecombe 2004).	No suitable habitat.	Would Not Occur
Peregrine Falcon *Falco peregrinus*	-	OS	-	The Peregrine Falcon is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings (Birdlife Australia, 2018).	Survey area may form part of larger home range but unlikely to breed in area	Possible

Species	Conservation Status			Habitat Description	Comments	Likelihood
	EPBC Act	BC Act	DBCA Priority			
Migratory Shorebirds (Various species)	IA/MI	IA/MI	P4	Prefer muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland (DAWE, 2020b).	No suitable habitat.	Would Not Occur
Western Rosella (inland) *Platycercus icterotis* subsp. *xanthogenys*	-	-	P4	The inland subspecies is found in eucalypt and sheoak woodlands and scrubs, especially those containing wandoo (*E. wandoo*), flooded gum, salmon gum (*E. salmonophloia*), tall mallee and rock sheoak (*Allocasuarina huegeliana*)	At extreme of known range, habitat unlikely to be present.	Unlikely
Chuditch *Dasyurus geoffroii*	VU	VU	-	Previously occurred throughout arid and semi-arid Australia but is now restricted to south-west Western Australia. (DAWE, 2020b).	Considered to be regionally extinct	Unlikely

APPENDIX E: LIST OF SPECIES IDENTIFIED WITHIN THE SURVEY AREA

(W) denotes introduced (weed) species; (A) denotes ephemeral (annual) species; (P) denotes Priority species

Family	Taxon	CLP-EW1	DD-AS1	RH-EW1	SCLP-MW1
Aizoaceae	*Disphyma crassifolium*	*			
	Mesembryanthemum nodiflorum (W)	*			
Amaranthaceae	*Ptilotus aervoides (A)*	*	*		
	Ptilotus exaltatus (A)	*	*	*	
	Ptilotus obovatus	*	*	*	
Apocynaceae	*Alyxia buxifolia*	*		*	*
	Leichardtia australis	*		*	
Asparagaceae	*Thysanotus manglesianus (A)*			*	
Asphodelaceae	*Asphodelus fistulosus (W)*	*			
Asteraceae	*Centaurea melitensis (W)*	*			
	Cratystylis conocephala	*			
	Cratystylis microcephala	*			
	Erymophyllum ramosum (A)	*			
	Millotia myosotidifolia (A)	*			
	Olearia muelleri	*		*	*
	Podolepis aristata (A)			*	
	Rhodanthe floribunda (A)	*	*		
	Sonchus oleraceus	*			
Boraginaceae	*Halgania andromedifolia*	*			
Brassicaceae	*Carrichtera annua (W)*	*			
Casuarinaceae	*Allocasuarina helmsii*	*		*	*
Chenopodiaceae	*Atriplex nummularia*	*		*	
	Atriplex vesicaria	*		*	
	Enchylaena tomentosa	*		*	
	Eriochiton sclerolaenoides			*	
	Maireana georgei	*	*	*	*
	Maireana pentameries	*		*	
	Maireana pyramidata	*			
	Maireana sedifolia	*			
	Maireana trichoptera	*		*	
	Maireana triptera	*	*	*	
	Rhagodia drummondii		*		
	Sclerolaena diacantha	*	*	*	
	Sclerolaena obliquicuspis	*			
	Tecticornia disarticulata	*		*	
Euphorbiaceae	*Euphorbia drummondii*	*			
Fabaceae	*Acacia acuminata*	*		*	*
	Acacia collegialis			*	
	Acacia colletioides	*	*		*
	Acacia erinacea	*		*	
	Acacia hemiteles	*			*
	Acacia jennerae	*			

Family	Taxon	CLP-EW1	DD-AS1	RH-EW1	SCLP-MW1
	Acacia merrallii	*			
	Acacia resinistipulea	*			
	Acacia tetragonophylla	*		*	
	Glycyrrhiza acanthocarpa	*			
	Jacksonia nematoclada				*
	Senna artemisioides subsp. *filifolia*	*			*
	Swainsona canescens	*			
	Templetonia ceracea		*		
Frankeniaceae	*Frankenia interioris* var. *interioris*	*	*	*	
Goodeniaceae	*Scaevola spinescens*	*		*	*
Hemerocallidaceae	*Dianella revoluta*		*		
Lamiaceae	*Prostanthera grylloana*		*	*	
	Salvia verbenaca (W)	*	*		
	Westringia rigida	*		*	*
Loranthaceae	*Amyema benthamii*	*			
Malvaceae	*Brachychiton gregorii*			*	
Myrtaceae	*Eucalyptus celastroides*	*		*	
	Eucalyptus griffithsii	*		*	*
	Eucalyptus lesouefii	*		*	
	Eucalyptus longicornis	*	*		
	Eucalyptus ravida	*		*	
	Eucalyptus salmonophloia	*	*		
	Eucalyptus salubris	*			
	Eucalyptus stricklandii			*	
	Eucalyptus torquata			*	
	Eucalyptus transcontinentalis	*			
	Eucalyptus urna	*			
	Melaleuca pauperiflora	*		*	
	Melaleuca sheathiana	*			
Pittosporaceae	*Pittosporum angustifolium*	*			
Poaceae	*Aristida contorta*			*	
	Austrostipa elegantissima	*		*	
	Austrostipa nitida	*	*	*	*
	Enneapogon caerulescens	*	*	*	
	Eragrostis dielsii	*			
	Triodia scariosa	*			*
Proteaceae	*Grevillea acuaria*	*		*	*
	Grevillea nematophylla	*		*	
Pteridaceae	*Cheilanthes sieberi*			*	
Rhamnaceae	*Cryptandra aridicola*				*
	Stenanthemum stipulosum				*
	Trymalium myrtillus subsp. *myrtillus*	*		*	*
Rutaceae	*Philotheca apiculata (P1)*	*			
Santalaceae	*Exocarpos aphyllus*	*	*	*	*
	Santalum acuminatum	*		*	

Family	Taxon	CLP-EW1	DD-AS1	RH-EW1	SCLP-MW1
	Santalum spicatum	*	*	*	*
Sapindaceae	*Dodonaea lobulata*	*		*	
	Dodonaea microzyga var. *acrolobata*			*	
	Dodonaea rigida	*			
	Dodonaea stenozyga			*	
Scrophulariaceae	*Eremophila alternifolia*		*	*	
	Eremophila caerulea	*		*	
	Eremophila decipiens		*		
	Eremophila dempsteri	*			
	Eremophila gibbosa			*	
	Eremophila glabra	*	*	*	*
	Eremophila interstans subsp. *interstans*	*		*	
	Eremophila interstans subsp. *virgata*	*	*		
	Eremophila ionantha	*	*		*
	Eremophila oldfieldii subsp. *angustifolia*	*			
	Eremophila oppositifolia	*		*	
	Eremophila psilocalyx	*		*	
	Eremophila scoparia	*			*
Solanaceae	*Lycium australe*	*			
	Solanum centrale	*			
	Solanum hoplopetalum (W)	*		*	
	Solanum lasiophyllum			*	
	Solanum nigrum (W)	*			
	Solanum nummularium	*		*	
Thymelaeaceae	*Pimelea microphylla*	*			
Violaceae	*Hybanthus floribundus*	*			*
Zygophyllaceae	*Roepera eremaea (A)*	*		*	*
	Roepera glauca (A)			*	

APPENDIX F: SIGNIFICANT FLORA LOCATIONS (GDA94, ZONE 51)

Status	Taxon	Abundance	Easting	Northing
P1	*Philotheca apiculata*	14	359527	6522799
P1	*Philotheca apiculata*	10	360653	6520014
P1	*Philotheca apiculata*	120	361071	6519749
P1	*Philotheca apiculata*	60	359647	6513562
P1	*Philotheca apiculata*	100	366158	6511829

APPENDIX G: VEGETATION CONDITION RATING

Vegetation Condition Rating	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e., areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

APPENDIX H: NATUREMAP SPECIES LIST (40KM BUFFER)

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 16/12/2021

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 121° 32' 15" E,31° 27' 19" S
Buffer 40km
Group By Family

Family	Species	Records
Acanthizidae	10	230
Acarosporaceae	1	1
Accipitridae	7	20
Actinopodidae	1	2
Aegothelidae	1	5
Agamidae	10	61
Aizoaceae	3	3
Amaranthaceae	6	31
Anatidae	6	15
Apiaceae	2	3
Apocynaceae	3	25
Araliaceae	4	5
Araneidae	5	7
Artamidae	4	17
Asparagaceae	4	7
Aspleniaceae	1	1
Asteraceae	55	110
Boidae	1	3
Boraginaceae	6	19
Brassicaceae	12	20
Bryaceae	1	1
Burramyidae	1	10
Buthidae	1	3
Campanulaceae	1	1
Campephagidae	1	19
Carphodactylidae	1	12
Casuariidae	1	13
Casuarinaceae	7	25
Celastraceae	2	3
Centrolepidaceae	2	2
Charadriidae	1	1
Chenopodiaceae	49	147
Cladoniaceae	2	3
Colchicaceae	1	1
Collemataceae	1	3
Columbidae	3	39
Corvidae	2	43
Cracticidae	4	80
Crassulaceae	2	2
Cuculidae	3	8
Cucurbitaceae	1	2
Cupressaceae	3	8
Cyperaceae	8	10
Dasyuridae	5	15
Dicaeidae	1	3
Dicranaceae	2	6
Dicruridae	4	41
Dilleniaceae	1	1
Diplodactylidae	7	24
Droseraceae	2	3
Elaeocarpaceae	1	9
Elapidae	14	77
Ericaceae	5	17
Euphorbiaceae	9	34
Fabaceae	66	217
Falconidae	4	18
Felidae	1	1
Fissidentaceae	1	1
Frankeniaceae	7	11
Garypidae	3	24
Gekkonidae	5	34
Geraniaceae	1	2
Goodeniaceae	15	56
Graphidaceae	3	7
Grimmiaceae	2	2
Gyrostemonaceae	2	4
Halcyonidae	2	3
Haloragaceae	4	17
Hemerocallidaceae	1	1
Hirundinidae	3	8
Hypericaceae	1	1
Icmadophilaceae	1	2
Isoetaceae	1	1
Lamiaceae	14	95
Lauraceae	1	1
Leporidae	1	1
Limnodynastidae	1	6

Loganiaceae	1	2
Loranthaceae	3	17
Lycosidae	9	63
Macropodidae	1	2
Maluridae	3	23
Malvaceae	12	42
Megalosporaceae	1	1
Megapodiidae	1	24
Meliphagidae	12	371
Meropidae	1	15
Miturgidae	1	1
Molluginaceae	1	1
Montiaceae	5	9
Muridae	4	21
Myobatrachidae	1	2
Myrtaceae	80	483
Neosittidae	1	4
Nitrariaceae	1	1
Orchidaceae	7	12
Orobanchaceae	1	1
Otididae	1	1
Pachycephalidae	5	117
Pardalotidae	3	91
Parmeliaceae	17	28
Petroicidae	5	32
Phalacrocoracidae	2	4
Phasianidae	2	2
Pholcidae	1	1
Physciaceae	1	2
Pittosporaceae	3	5
Plantaginaceae	1	3
Poaceae	19	40
Podicipedidae	2	11
Pomatostomidae	2	35
Pottiaceae	3	3
Primulaceae	1	3
Prodidomidae	1	1
Proteaceae	23	63
Psittacidae	8	27
Psoraceae	1	3
Pteridaceae	4	8
Pygopodidae	5	12
Rallidae	2	7
Ranunculaceae	1	1
Recurvirostridae	1	2
Rhamnaceae	8	26
Ricciaceae	1	1
Rubiaceae	1	1
Rutaceae	9	20
Salticidae	1	1
Santalaceae	4	26
Sapindaceae	5	44
Scincidae	20	65
Scolopacidae	1	1
Scolopendridae	2	3
Scrophulariaceae	31	182
Scutigeridae	1	1
Solanaceae	10	26
Sparassidae	1	1
Stylidiaceae	8	13
Teloschistaceae	2	2
Thamnocephalidae	2	2
Theridiidae	1	3
Thymelaeaceae	6	13
Typhaceae	1	1
Urodacidae	1	14
Varanidae	2	6
Verbenaceae	1	1
Vespertilionidae	1	1
Violaceae	2	5
Zodariidae	1	1
Zosteropidae	1	6
Zygophyllaceae	6	7
TOTAL	**821**	**3834**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthizidae					
1.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
4.	25528	*Aphelocephala leucopsis (Southern Whiteface)*			
5.	24269	*Calamanthus campestris (Rufous Fieldwren)*			
6.	25530	*Gerygone fusca (Western Gerygone)*			
7.	24277	*Hylacola cauta (Shy Groundwren, Shy Heathwren)*			
8.	24278	*Pyrrholaemus brunneus (Redthroat)*			
9.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
10.	30948	*Smicrornis brevirostris (Weebill)*			
Acarosporaceae					
11.	46014	*Myriospora smaragdula*			
Accipitridae					
12.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
13.	25536	*Accipiter fasciatus (Brown Goshawk)*			
14.	24285	*Aquila audax (Wedge-tailed Eagle)*			
15.	24289	*Circus assimilis (Spotted Harrier)*			
16.	24295	*Haliastur sphenurus (Whistling Kite)*			
17.	47965	*Hieraaetus morphnoides (Little Eagle)*			
18.		*Lophoictinia isura*			
Actinopodidae					
19.		*Missulena occatoria*			
Aegothelidae					
20.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
Agamidae					
21.	24871	*Ctenophorus cristatus (Bicycle Dragon)*			
22.	24873	*Ctenophorus fordi (Mallee Sand Dragon)*			
23.	24883	*Ctenophorus ornatus (Ornate Crevice-Dragon)*			
24.	24886	*Ctenophorus reticulatus (Western Netted Dragon)*			
25.	24888	*Ctenophorus salinarum (Salt Pan Dragon)*			
26.	24889	*Ctenophorus scutulatus (Lozenge-marked Dragon)*			
27.	24904	*Moloch horridus (Thorny Devil)*			
28.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
29.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
30.	30814	*Tympanocryptis cephalus (Pebble Dragon)*			
Aizoaceae					
31.	2804	*Gunniopsis glabra*			
32.	2807	*Gunniopsis quadrifida (Sturts Pigface)*			
33.	2808	*Gunniopsis rodwayi*			
Amaranthaceae					
34.	2721	*Ptilotus exaltatus (Tall Mulla Mulla)*			
35.	2730	*Ptilotus helichrysoides*			
36.	2732	*Ptilotus holosericeus*			
37.	2747	*Ptilotus obovatus (Cotton Bush)*			
38.	31252	*Ptilotus rigidus*		P1	
39.	43203	*Surreya diandra*			
Anatidae					
40.	24312	*Anas gracilis (Grey Teal)*			
41.	24315	*Anas rhynchotis (Australasian Shoveler)*			
42.	24316	*Anas superciliosa (Pacific Black Duck)*			
43.	24319	*Biziura lobata (Musk Duck)*			
44.	24322	*Cygnus atratus (Black Swan)*			
45.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
Apiaceae					
46.	6252	*Platysace effusa*			
47.	14999	*Platysace trachymenioides*			
Apocynaceae					
48.	6565	*Alyxia buxifolia (Dysentery Bush)*			
49.	12949	*Marsdenia australis*			
50.	48986	*Vincetoxicum lineare*			
Araliaceae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
51.	11546	*Hydrocotyle pilifera var. glabrata*			
52.	6239	*Hydrocotyle rugulosa*			
53.	6268	*Trachymene cyanopetala*			
54.	19044	*Trachymene pyrophila*		P2	
Araneidae					
55.		*Araneus eburneiventris*			
56.		*Araneus senicaudatus*			
57.		*Backobourkia heroine*			
58.		*Eriophora biapicata*			
59.		*Nephila edulis*			
Artamidae					
60.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
61.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
62.	24355	*Artamus minor (Little Woodswallow)*			
63.	24356	*Artamus personatus (Masked Woodswallow)*			
Asparagaceae					
64.	1226	*Lomandra effusa (Scented Matrush)*			
65.	1313	*Sowerbaea multicaulis (Many Stemmed Lily)*		P4	
66.	1338	*Thysanotus manglesianus (Fringed Lily)*			
67.	1352	*Thysanotus speckii*			
Aspleniaceae					
68.	65	*Pleurosorus rutifolius (Blanket Fern)*			
Asteraceae					
69.	7833	*Angianthus preissianus*			
70.	7836	*Angianthus tomentosus (Camel-grass)*			
71.	7846	*Asteridea athrixioides*			
72.	7871	*Brachyscome ciliaris*			
73.	7880	*Brachyscome lineariloba*			
74.	7903	*Calotis hispidula (Bindy Eye)*			
75.	7905	*Calotis multicaulis (Many-stemmed Burr-daisy)*			
76.	7916	*Centaurea melitensis (Maltese Cockspur, Malta Thistle)*	Y		
77.	7922	*Cephalipterum drummondii (Pompom Head)*			
78.	47074	*Chrysocephalum apiculatum subsp. norsemanense*		P3	
79.	13138	*Chrysocephalum puteale*			
80.	7933	*Chthonocephalus pseudevax (Woolly Groundheads)*			
81.	7949	*Cratystylis conocephala (Greybush)*			
82.	7950	*Cratystylis microphylla (Small-leaved Grey Bush)*			
83.	7951	*Cratystylis subspinescens (Australian Sage, Spiny Grey Bush)*			
84.	14377	*Erymophyllum ramosum subsp. ramosum*			
85.	16311	*Gazania linearis*	Y		
86.	12624	*Gnephosis angianthoides*			
87.	8003	*Gnephosis tridens*			
88.	12742	*Hyalosperma demissum*			
89.	15447	*Hyalosperma glutinosum subsp. glutinosum*			
90.	12756	*Hyalosperma zacchaeus*			
91.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
92.	8105	*Millotia myosotidifolia*			
93.	8107	*Minuria cunninghamii (Bush Minuria)*			
94.	8134	*Olearia exiguifolia (Small-leaved Daisy Bush)*			
95.	8136	*Olearia homolepis*			
96.	8140	*Olearia muelleri (Goldfields Daisy)*			
97.	8145	*Olearia pimeleoides (Pimelea Daisybush, Burrobunga)*			
98.	44401	*Olearia sp. Eremicola (Diels & Pritzel s.n. PERTH 00449628)*			
99.	19582	*Olearia trifurcata*			
100.	19828	*Oligocarpus calendulaceus*	Y		
101.	20661	*Oncosiphon suffruticosum (Calomba Daisy)*	Y		
102.	45238	*Podolepis aristata subsp. affinis*			
103.	8176	*Podolepis kendallii*			
104.	8177	*Podolepis lessonii*			
105.	12731	*Podotheca wilsonii*			
106.	8195	*Quinetia urvillei*			
107.	13306	*Rhodanthe battii*			
108.	13239	*Rhodanthe chlorocephala*			
109.	13301	*Rhodanthe floribunda*			
110.	13293	*Rhodanthe haigii*			
111.	13294	*Rhodanthe laevis*			
112.	13249	*Rhodanthe oppositifolia subsp. oppositifolia*			
113.	13253	*Rhodanthe rubella*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
114.	8200	*Schoenia cassiniana (Schoenia)*			
115.	8207	*Senecio glossanthus (Slender Groundsel)*			
116.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
117.	8238	*Streptoglossa liatroides*			
118.	13298	*Thiseltonia gracillima*			
119.	12652	*Trichanthodium skirrophorum*			
120.	8253	*Triptilodiscus pygmaeus*			
121.	11788	*Vittadinia dissecta var. hirta*			
122.	13331	*Waitzia acuminata var. acuminata*			
123.	46093	*Waitzia fitzgibbonii*			
Boidae					
124.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
Boraginaceae					
125.	6681	*Echium plantagineum (Paterson's Curse)*	Y		
126.	6684	*Halgania andromedifolia*			
127.	29840	*Halgania cyanea var. Allambi Stn (B.W. Strong 676)*			
128.	31117	*Halgania cyanea var. Charleville (R.W. Purdie +111)*			
129.	6691	*Halgania integerrima*			
130.	6692	*Halgania lavandulacea (Blue Bush)*			
Brassicaceae					
131.	31876	*Arabidella chrysodema*			
132.	2992	*Arabidella trisecta*			
133.	2999	*Brassica rapa*	Y		
134.	3008	*Carrichtera annua (Ward's Weed)*	Y		
135.	3018	*Lepidium africanum (Rubble Peppercress)*	Y		
136.	3033	*Lepidium oxytrichum*			
137.	3039	*Lepidium platypetalum (Slender Peppercress)*			
138.	3059	*Phlegmatospermum eremaeum*		P3	
139.	3069	*Sisymbrium erysimoides (Smooth Mustard)*	Y		
140.	3074	*Stenopetalum anfractum*			
141.	3076	*Stenopetalum filifolium*			
142.	3077	*Stenopetalum lineare (Narrow Thread Petal)*			
Bryaceae					
143.	32426	*Rosulabryum campylothecium*			
Burramyidae					
144.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
Buthidae					
145.		*Isometroides vescus*			
Campanulaceae					
146.	7386	*Wahlenbergia gracilenta (Annual Bluebell)*			
Campephagidae					
147.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
Carphodactylidae					
148.	24966	*Nephrurus laevissimus*			
Casuariidae					
149.	24470	*Dromaius novaehollandiae (Emu)*			
Casuarinaceae					
150.	13904	*Allocasuarina acutivalvis subsp. acutivalvis*			
151.	1721	*Allocasuarina campestris*			
152.	13897	*Allocasuarina eriochlamys subsp. grossa*		P3	
153.	1730	*Allocasuarina helmsii*			
154.	1731	*Allocasuarina huegeliana (Rock Sheoak, Kwowl)*			
155.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
156.	12658	*Casuarina pauper (Black Oak)*			
Celastraceae					
157.	4725	*Psammomoya choretroides*			
158.	29813	*Stackhousia sp. Mt Keith (G. Cockerton & G. O'Keefe 11017)*			
Centrolepidaceae					
159.	13122	*Centrolepis cephaloformis subsp. cephaloformis*			
160.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
Charadriidae					
161.	24377	*Charadrius ruficapillus (Red-capped Plover)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Chenopodiaceae					
162.	11489	*Atriplex acutibractea subsp. karoniensis*			
163.	2453	*Atriplex codonocarpa (Flat-topped Saltbush)*			
164.	2455	*Atriplex eardleyae*			
165.	2468	*Atriplex nana*			
166.	2469	*Atriplex nummularia (Old Man Saltbush)*			
167.	11516	*Atriplex nummularia subsp. spathulata (Old Man Saltbush)*			
168.	11791	*Atriplex quadrivalvata var. quadrivalvata*			
169.	2481	*Atriplex vesicaria (Bladder Saltbush)*			
170.	2499	*Dissocarpus paradoxus (Curious Saltbush)*			
171.	2511	*Enchylaena tomentosa (Barrier Saltbush)*			
172.	2514	*Eriochiton sclerolaenoides (Woolly Bindii)*			
173.	2533	*Maireana amoena*			
174.	2535	*Maireana appressa*			
175.	2543	*Maireana eriosphaera*			
176.	2544	*Maireana georgei (Satiny Bluebush)*			
177.	2550	*Maireana marginata*			
178.	2553	*Maireana oppositifolia*			
179.	2555	*Maireana pentatropis*			
180.	2560	*Maireana pyramidata (Sago Bush)*			
181.	2561	*Maireana radiata*			
182.	2563	*Maireana sedifolia (Pearl Bluebush, Myall)*			
183.	2565	*Maireana suaedifolia*			
184.	2567	*Maireana tomentosa (Felty Bluebush)*			
185.	11662	*Maireana tomentosa subsp. tomentosa*			
186.	2568	*Maireana trichoptera (Downy Bluebush)*			
187.	2580	*Rhagodia crassifolia (Fleshy Saltbush)*			
188.	2581	*Rhagodia drummondii*			
189.	30434	*Salsola australis*			
190.	2599	*Sclerolaena brevifolia*			
191.	2606	*Sclerolaena cuneata (Yellow Bindii)*			
192.	2609	*Sclerolaena diacantha (Grey Copperburr)*			
193.	2610	*Sclerolaena drummondii*			
194.	2625	*Sclerolaena obliquicuspis (Limestone Bindii)*			
195.	2626	*Sclerolaena parviflora (Small-flower Saltbush)*			
196.	2641	*Tecticornia arborea (Bulli Bulli)*			
197.	31492	*Tecticornia disarticulata*			
198.	31834	*Tecticornia flabelliformis*		P1	
199.	33236	*Tecticornia halocnemoides (Shrubby Samphire)*			
200.	33237	*Tecticornia halocnemoides subsp. halocnemoides*			
201.	33318	*Tecticornia indica subsp. leiostachya (Samphire)*			
202.	31718	*Tecticornia lepidosperma*			
203.	31675	*Tecticornia lylei*			
204.	46514	*Tecticornia mellarium*		P1	
205.	31551	*Tecticornia moniliformis*			
206.	31674	*Tecticornia peltata*			
207.	33297	*Tecticornia pergranulata subsp. pergranulata (Blackseed Samphire)*			
208.	31618	*Tecticornia pruinosa*			
209.	31716	*Tecticornia syncarpa*			
210.	31494	*Tecticornia triandra (Desert Glasswort)*			
Cladoniaceae					
211.	48176	*Cladia beaugleholei*			
212.	48177	*Cladia muelleri*			
Colchicaceae					
213.	1403	*Wurmbea tenella (Eight Nancy)*			
Collemataceae					
214.	48194	*Collema novozelandicum*			
Columbidae					
215.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
216.	24409	*Phaps chalcoptera (Common Bronzewing)*			
217.	25587	*Phaps elegans (Brush Bronzewing)*			
Corvidae					
218.	24416	*Corvus bennetti (Little Crow)*			
219.	25592	*Corvus coronoides (Australian Raven)*			
Cracticidae					
220.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
221.	25595	*Cracticus tibicen (Australian Magpie)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
222.	25596	*Cracticus torquatus (Grey Butcherbird)*			
223.	25597	*Strepera versicolor (Grey Currawong)*			
Crassulaceae					
224.	19376	*Bryophyllum delagoense*	Y		
225.	11563	*Crassula colorata var. colorata*			
Cuculidae					
226.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
227.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
228.	24431	*Chrysococcyx basalis (Horsfield's Bronze Cuckoo)*			
Cucurbitaceae					
229.	48838	*Citrullus amarus*	Y		
Cupressaceae					
230.	8466	*Callitris columellaris (White Cypress Pine)*			
231.	96	*Callitris preissii (Rottnest Island Pine, Maro)*			
232.	8637	*Callitris verrucosa*			
Cyperaceae					
233.	31760	*Lepidosperma diurnum*			
234.	41647	*Lepidosperma sanguinolentum*			
235.		*Lepidosperma sp.*			
236.	30437	*Lepidosperma sp. Kambalda (A.A. Mitchell 5156)*			Y
237.	30438	*Lepidosperma sp. Parker Range (N. Gibson & M. Lyons 2094)*		P1	
238.	993	*Schoenus hexandrus*			
239.	1002	*Schoenus nanus (Tiny Bog Rush)*			
240.	1015	*Schoenus subaphyllus*			
Dasyuridae					
241.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
242.	24096	*Ningaui yvonneae (Southern Ningaui)*			
243.	24109	*Sminthopsis dolichura (Little long-tailed Dunnart)*			
244.		*Sminthopsis murina*			
245.	24117	*Sminthopsis ooldea (Ooldea Dunnart)*			
Dicaeidae					
246.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
Dicranaceae					
247.	32461	*Campylopus bicolor var. bicolor*			
248.	32338	*Campylopus introflexus*	Y		
Dicruridae					
249.	24443	*Grallina cyanoleuca (Magpie-lark)*			
250.	25610	*Myiagra inquieta (Restless Flycatcher)*			
251.	48096	*Rhipidura albiscapa (Grey Fantail)*			
252.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
Dilleniaceae					
253.	19779	*Hibbertia glomerosa var. glomerosa*			
Diplodactylidae					
254.	24918	*Crenadactylus ocellatus subsp. ocellatus (Clawless Gecko)*			
255.	24929	*Diplodactylus granariensis subsp. granariensis*			
256.	24940	*Diplodactylus pulcher*			
257.	42408	*Hesperoedura reticulata*			
258.	30935	*Lucasium maini*			
259.	24923	*Strophurus assimilis (Goldfields Spiny-tailed Gecko)*			
260.	24927	*Strophurus elderi*			
Droseraceae					
261.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
262.	41202	*Drosera yilgarnensis*			
Elaeocarpaceae					
263.	41500	*Tetratheca spenceri*		T	Y
Elapidae					
264.	42380	*Brachyurophis fasciolatus subsp. fasciolatus (Narrow-banded Shovel-nosed Snake)*			
265.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
266.	25247	*Demansia psammophis subsp. psammophis (Yellow-faced Whipsnake)*			
267.	25301	*Furina ornata (Moon Snake)*			
268.	25253	*Parasuta gouldii*			
269.	25254	*Parasuta monachus*			
270.	25255	*Parasuta nigriceps*			

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271.	25261	*Pseudechis australis (Mulga Snake)*			
272.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
273.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
274.	25263	*Pseudonaja modesta (Ringed Brown Snake)*			
275.	25264	*Pseudonaja nuchalis (Gwardar, Northern Brown Snake)*			
276.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
277.	25269	*Suta fasciata (Rosen's Snake)*			
Ericaceae					
278.	41770	*Leucopogon sp. Boorabbin (K.R. Newbey 8374)*			
279.	16049	*Leucopogon sp. Clyde Hill (M.A. Burgman 1207)*			
280.	20763	*Leucopogon sp. Coolgardie (M. Hislop & F. Hort MH 3197)*			
281.	29493	*Leucopogon sp. Kambalda (J. Williams s.n. PERTH 07305028)*		P3	Y
282.	16051	*Leucopogon sp. Kau Rock (M.A. Burgman 1126)*			
Euphorbiaceae					
283.	4591	*Bertya dimerostigma*			
284.	4598	*Beyeria lechenaultii (Pale Turpentine Bush)*			
285.	34276	*Beyeria sulcata var. brevipes*			
286.	34257	*Beyeria sulcata var. sulcata*			
287.	42867	*Euphorbia multifaria*			
288.	12097	*Euphorbia tannensis subsp. eremophila (Desert Spurge)*			
289.	19587	*Monotaxis grandiflora var. obtusifolia*			
290.	45075	*Ricinocarpos sp. Eastern Goldfields (A. Williams 3)*		P1	
291.	4701	*Ricinocarpos stylosus*			
Fabaceae					
292.	3200	*Acacia acuminata (Jam, Mangard)*			
293.	3248	*Acacia burkittii (Sandhill Wattle)*			
294.	3249	*Acacia calcarata*			
295.	3251	*Acacia camptoclada*			
296.	3256	*Acacia chrysella*			
297.	44514	*Acacia collegialis*			
298.	3264	*Acacia colletioides (Wait-a-while)*			
299.	3291	*Acacia dempsteri*			
300.	3315	*Acacia duriuscula*			
301.	16168	*Acacia enervia subsp. enervia*			
302.	16020	*Acacia eremophila var. eremophila*			
303.	3324	*Acacia erinacea*			
304.	44512	*Acacia fraternalis*			
305.	15282	*Acacia gibbosa*			
306.	3366	*Acacia hemiteles*			
307.	3378	*Acacia inaequiloba*			
308.	3379	*Acacia inamabilis*			
309.	3393	*Acacia jennerae*			
310.	3400	*Acacia kerryana*		P2	
311.	3408	*Acacia lasiocalyx (Silver Wattle, Wilyurwur)*			
312.	3419	*Acacia ligulata (Umbrella Bush, Watarka)*			
313.	3426	*Acacia longispinea*			
314.	13503	*Acacia masliniana*			
315.	3440	*Acacia merrallii*			
316.	36416	*Acacia mulganeura*			
317.	3463	*Acacia nyssophylla*			
318.	3478	*Acacia pachypoda*			
319.	3495	*Acacia prainii (Prain's Wattle)*			
320.	3498	*Acacia pritzeliana*			
321.	19499	*Acacia ramulosa var. ramulosa*			
322.	3512	*Acacia rendlei*			
323.	3513	*Acacia resinimarginea*			
324.	3539	*Acacia sericocarpa*			
325.		*Acacia sp.*			
326.	3577	*Acacia tetragonophylla (Kurara, Wakalpuka)*			
327.	3589	*Acacia uncinella*			
328.	3599	*Acacia warramaba*			
329.	3600	*Acacia websteri*		P1	
330.	16157	*Acacia xerophila var. brevior*			
331.	30233	*Bossiaea laxa*		P2	Y
332.	17117	*Cullen cinereum*			
333.	8977	*Daviesia aphylla*			
334.	3802	*Daviesia croniniana*			
335.	3813	*Daviesia grahamii*			
336.	3829	*Daviesia pachyloma*			

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337.	3924	*Gastrolobium spinosum (Prickly Poison)*			
338.	19925	*Glycine peratosa*			
339.	3943	*Glycyrrhiza acanthocarpa (Native Liquorice)*			
340.	10777	*Gompholobium gompholobioides*			
341.	17787	*Goodia medicaginea*			
342.	39783	*Goodia stenocarpa*			
343.	40320	*Indigofera australis subsp. hesperia*			
344.	14779	*Jacksonia arida*			
345.	4043	*Kennedia prorepens*			
346.	17641	*Leptosema cervicorne*			
347.	4089	*Mirbelia depressa*			
348.	4094	*Mirbelia microphylla*			
349.	4095	*Mirbelia multicaulis*			
350.	17645	*Senna artemisioides*			
351.	12276	*Senna artemisioides subsp. filifolia*			
352.	17558	*Senna artemisioides subsp. x artemisioides*			
353.	12315	*Senna pleurocarpa var. angustifolia*			
354.	4217	*Swainsona beasleyana*			
355.	4220	*Swainsona canescens (Grey Swainsona)*			
356.	4221	*Swainsona colutoides (Bladder Vetch)*			
357.	35840	*Templetonia ceracea*			
Falconidae					
358.	25621	*Falco berigora (Brown Falcon)*			
359.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
360.	25623	*Falco longipennis (Australian Hobby)*			
361.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Felidae					
362.	24041	*Felis catus (Cat)*	Y		
Fissidentaceae					
363.	32367	*Fissidens megalotis*			
Frankeniaceae					
364.	5191	*Frankenia cinerea*			
365.	5197	*Frankenia desertorum*			
366.	5204	*Frankenia interioris*			
367.	11592	*Frankenia interioris var. interioris*			
368.	11969	*Frankenia interioris var. parviflora*			
369.	5205	*Frankenia irregularis*			
370.	5212	*Frankenia setosa (Bristly Frankenia)*			
Garypidae					
371.		*Synsphyronus dorothyae*			
372.		*Synsphyronus lathrius*			
373.		*Synsphyronus mimulus*			
Gekkonidae					
374.	24980	*Christinus marmoratus (Marbled Gecko)*			
375.	24957	*Gehyra purpurascens*			
376.	24959	*Gehyra variegata*			
377.	24961	*Heteronotia binoei (Bynoe's Gecko)*			
378.	24983	*Underwoodisaurus milii (Barking Gecko)*			
Geraniaceae					
379.	4335	*Erodium cygnorum (Blue Heronsbill)*			
Goodeniaceae					
380.	7413	*Brunonia australis (Native Cornflower)*			
381.	19069	*Brunonia sp. Goldfields (K.R. Newbey 6044)*			
382.	7419	*Coopernookia strophiolata*			
383.	13155	*Dampiera latealata*			
384.	7477	*Dampiera stenostachya (Narrow-spiked Dampiera)*			
385.	13158	*Dampiera tenuicaulis var. curvula*			
386.	13159	*Dampiera tenuicaulis var. tenuicaulis*			
387.	31833	*Goodenia corralina*		P2	Y
388.	7506	*Goodenia elderi*			
389.	7514	*Goodenia havilandii*			
390.	7531	*Goodenia occidentalis*			
391.	7541	*Goodenia pusilliflora (Smallflower Goodenia)*			
392.	7565	*Goodenia xanthosperma (Yellow-seeded Goodenia)*			
393.	7644	*Scaevola spinescens (Currant Bush, Maroon)*			
394.	7664	*Velleia rosea (Pink Velleia)*			

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Graphidaceae					
395.	27720	*Diploschistes hensseniae*			
396.	27723	*Diploschistes scruposus*			
397.	44221	*Xalocoa ocellata*			
Grimmiaceae					
398.	32386	*Grimmia laevigata*			
399.	32473	*Grimmia pulvinata var. africana*			
Gyrostemonaceae					
400.	2778	*Codonocarpus cotinifolius (Native Poplar, Kundurangu)*			
401.	2783	*Gyrostemon racemiger*			
Halcyonidae					
402.	42351	*Todiramphus pyrrhopygius (Red-backed Kingfisher)*			
403.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
Haloragaceae					
404.	33620	*Glischrocaryon angustifolium*			
405.	11801	*Gonocarpus confertifolius var. helmsii*			
406.	6174	*Haloragis gossei*			
407.	6180	*Haloragis trigonocarpa*			
Hemerocallidaceae					
408.	23501	*Agrostocrinum scabrum subsp. scabrum*			
Hirundinidae					
409.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
410.	24491	*Hirundo neoxena (Welcome Swallow)*			
411.	48061	*Petrochelidon nigricans (Tree Martin)*			
Hypericaceae					
412.	5180	*Hypericum gramineum (Small St John's Wort)*			
Icmadophilaceae					
413.	28060	*Siphula coriacea*			
Isoetaceae					
414.	12	*Isoetes inflata*			
Lamiaceae					
415.	6751	*Cyanostegia microphylla (Tinsel Flower)*			
416.	41025	*Dasymalla terminalis (Native Foxglove)*			
417.	6771	*Dicrastylis parvifolia*			
418.	6776	*Hemiphora elderi (Red Velvet)*			
419.	6812	*Pityrodia lepidota*			
420.	42561	*Pityrodia scabra subsp. dendrotricha*		P3	
421.	15822	*Prostanthera althoferi subsp. althoferi*			
422.	6912	*Prostanthera campbellii*			
423.	6916	*Prostanthera grylloana*			
424.	6917	*Prostanthera incurvata*			
425.	12728	*Prostanthera splendens*		P1	
426.	6929	*Salvia verbenaca (Wild Sage)*	Y		
427.	6938	*Westringia cephalantha*			
428.	9247	*Westringia rigida (Stiff Westringia)*			
Lauraceae					
429.	2953	*Cassytha melantha (Large Dodder-laurel)*			
Leporidae					
430.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
Limnodynastidae					
431.	25425	*Neobatrachus kunapalari (Kunapalari Frog)*			
Loganiaceae					
432.	16824	*Phyllangium sulcatum*			
Loranthaceae					
433.	2369	*Amyema benthamii*			
434.	2380	*Amyema miquelii (Stalked Mistletoe)*			
435.	2383	*Amyema preissii (Wireleaf Mistletoe)*			
Lycosidae					
436.		*Hoggicosa castanea*			
437.		*Hoggicosa storri*			
438.		*Hogna pexa*			
439.		*Hogna salifodina*			

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440.		*Mainosa longipes*			
441.		*Pardosa pexa*			Y
442.		*Tasmanicosa leuckartii*			
443.		*Tetralycosa alteripa*			
444.		*Venator yalkara*			
Macropodidae					
445.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
Maluridae					
446.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
447.	24551	*Malurus pulcherrimus (Blue-breasted Fairy-wren)*			
448.	25654	*Malurus splendens (Splendid Fairy-wren)*			
Malvaceae					
449.	4905	*Alyogyne hakeifolia*			
450.	40910	*Androcalva luteiflora (Yellow-flowered Rulingia)*			
451.	4999	*Brachychiton gregorii (Desert Kurrajong, Ngalta)*			
452.	40923	*Commersonia craurophylla (Brittle Leaved Rulingia)*			
453.	17725	*Hannafordia bissillii subsp. latifolia*			
454.	4951	*Lawrencia chrysoderma*			
455.	4956	*Lawrencia helmsii (Dunna Dunna)*			
456.	4957	*Lawrencia repens*			
457.	41544	*Malva weinmanniana*			
458.	4964	*Radyera farragei (Knobby Hibiscus)*			
459.	46824	*Seringia velutina (Velvet firebush)*			
460.	4981	*Sida intricata (Tangled Sida)*			
Megalosporaceae					
461.		*Aspicilia sp.*			
Megapodiidae					
462.	24557	*Leipoa ocellata (Malleefowl)*		T	
Meliphagidae					
463.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
464.	24561	*Anthochaera carunculata (Red Wattlebird)*			
465.	24564	*Certhionyx variegatus (Pied Honeyeater)*			
466.	24567	*Epthianura albifrons (White-fronted Chat)*			
467.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
468.	24573	*Lichenostomus cratitius (Purple-gaped Honeyeater)*			
469.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
470.	25661	*Lichmera indistincta (Brown Honeyeater)*			
471.	24583	*Manorina flavigula (Yellow-throated Miner)*			
472.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
473.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
474.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
Meropidae					
475.	24598	*Merops ornatus (Rainbow Bee-eater)*			
Miturgidae					
476.		*Diaprograpta peterandrewsi*			Y
Molluginaceae					
477.	48203	*Hypertelis cerviana*			
Montiaceae					
478.	2853	*Calandrinia eremaea (Twining Purslane)*			
479.	48774	*Calandrinia lefroyensis*		P1	
480.	48569	*Calandrinia sp. Gypsum (F. Obbens & L. Hancock FO 10/14)*			
481.	19454	*Calandrinia sp. Needilup (K.R. Newbey 4892)*			
482.	30396	*Calandrinia translucens*			
Muridae					
483.	24223	*Mus musculus (House Mouse)*	Y		
484.	24229	*Notomys mitchellii (Mitchell's Hopping-mouse)*			
485.	24232	*Pseudomys bolami (Bolam's Mouse)*			
486.	24237	*Pseudomys hermannsburgensis (Sandy Inland Mouse)*			
Myobatrachidae					
487.	25434	*Pseudophryne occidentalis (Western Toadlet)*			
Myrtaceae					
488.	5408	*Calothamnus gilesii*			
489.	5432	*Calothamnus tuberosus*			
490.	5438	*Calytrix amethystina*			

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491.	5483	*Calytrix tetragona (Common Fringe-myrtle)*			
492.	5491	*Chamelaucium ciliatum*			
493.	44082	*Cyathostemon divaricatus*		P1	Y
494.	42066	*Cyathostemon heterantherus*			
495.	35618	*Darwinia sp. Karonie (K. Newbey 8503)*			
496.		*Eremaea zonospila*			Y
497.	13035	*Eucalyptus aspratilis*			
498.	5581	*Eucalyptus campaspe (Silver Gimlet)*			
499.	5584	*Eucalyptus celastroides (Mirret, Mired)*			
500.	14300	*Eucalyptus celastroides subsp. celastroides (Mirret)*			
501.	5595	*Eucalyptus comitae-vallis (Comet Vale Mallee)*			
502.	5596	*Eucalyptus concinna (Victoria Desert Mallee)*			
503.	5612	*Eucalyptus cylindrocarpa (Woodline Mallee)*			
504.	14814	*Eucalyptus delicata*			
505.	5637	*Eucalyptus eremophila (Tall Sand Mallee)*			
506.	5648	*Eucalyptus flocktoniae (Merrit, Merid)*			
507.	5662	*Eucalyptus gracilis (Yorrell)*			
508.	5665	*Eucalyptus griffithsii (Griffith's Grey Gum)*			
509.	5673	*Eucalyptus horistes*			
510.	5675	*Eucalyptus incrassata (Lerp Mallee)*			
511.	13056	*Eucalyptus leptopoda subsp. subluta*			
512.	5697	*Eucalyptus lesouefii (Goldfields Blackbutt)*			
513.	12901	*Eucalyptus livida (Mallee Wandoo)*			
514.	5701	*Eucalyptus longicornis (Red Morrel, Moril)*			
515.	20802	*Eucalyptus longissima*			
516.	13037	*Eucalyptus loxophleba subsp. lissophloia*			
517.	5726	*Eucalyptus oleosa (Giant Mallee)*			
518.	20091	*Eucalyptus oleosa subsp. oleosa*			
519.	13524	*Eucalyptus olivina*			
520.	5742	*Eucalyptus petraea (Granite Rock Box)*			
521.	5745	*Eucalyptus pileata (Capped Mallee)*			
522.	18580	*Eucalyptus planipes*			
523.	5747	*Eucalyptus platycorys (Boorabbin Mallee)*			
524.	19064	*Eucalyptus prolixa*			
525.	12380	*Eucalyptus ravida (Silver-topped Gimlet)*			
526.	5761	*Eucalyptus rigidula (Stiff-leaved Mallee)*			
527.	12693	*Eucalyptus salicola (Salt Gum)*			
528.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
529.	5767	*Eucalyptus salubris (Gimlet)*			
530.	46828	*Eucalyptus sp. Southern smooth-bark (D. Nicolle & M. French DN 6916)*			
531.	5780	*Eucalyptus stricklandii (Strickland's Gum)*			
532.	13027	*Eucalyptus tenera*			
533.	13521	*Eucalyptus tenuis*			
534.	5792	*Eucalyptus torquata (Coral Gum)*			
535.	5793	*Eucalyptus transcontinentalis (Redwood, Pungul)*			
536.	18293	*Eucalyptus urna*			
537.	5798	*Eucalyptus websteriana (Webster's Mallee)*			
538.	13054	*Eucalyptus websteriana subsp. websteriana*			
539.	18269	*Eucalyptus x brachyphylla*		P4	
540.	5802	*Eucalyptus yilgarnensis (Yorrell)*			
541.	5815	*Homalocalyx thryptomenoides*			
542.	48652	*Hysterobaeckea petraea*			
543.	5840	*Kunzea pulchella (Granite Kunzea, Silky Kunzea)*			
544.	5848	*Leptospermum fastigiatum*			
545.	17133	*Leptospermum sp. Peak Charles/Norseman (K.R. Newbey 5243)*			
546.	12692	*Leptospermum subtenue*			
547.	15063	*Melaleuca acuminata subsp. acuminata*			
548.	5891	*Melaleuca coccinea (Goldfields Bottlebrush)*		P3	
549.	5909	*Melaleuca elliptica (Granite Bottlebrush, Ngow)*			
550.	20286	*Melaleuca exuvia*			
551.	15603	*Melaleuca fulgens subsp. fulgens*			
552.	19486	*Melaleuca hamata*			
553.	5922	*Melaleuca lanceolata (Rottnest Teatree, Moonah)*			
554.	14701	*Melaleuca macronychia subsp. trygonoides*		P3	
555.	15663	*Melaleuca pauperiflora subsp. fastigiata*			
556.	18266	*Melaleuca procera*			
557.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
558.	5966	*Melaleuca sheathiana (Boree, Buri)*			
559.	5981	*Melaleuca thyoides*			
560.	5984	*Melaleuca uncinata (Broom Bush, Kwidjard)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
561.	20287	*Melaleuca zeteticorum*			
562.	9187	*Micromyrtus erichsenii*			
563.	20103	*Taxandria spathulata*			
564.	19699	*Thryptomene australis subsp. brachyandra*			
565.	36017	*Thryptomene sp. Londonderry (R.H. Kuchel 1763)*		P1	
566.	6087	*Verticordia helmsii*			
567.	12433	*Verticordia insignis subsp. compta*			
Neosittidae					
568.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
Nitrariaceae					
569.	4366	*Nitraria billardierei (Nitre Bush)*			
Orchidaceae					
570.	15370	*Caladenia microchila*			
571.	1614	*Caladenia roei (Ant Orchid)*			
572.	15400	*Cyanicula amplexans*			
573.	44161	*Diuris hazeliae*			
574.	1684	*Pterostylis allantoidea (Shy Greenhood)*			
575.	18657	*Pterostylis sp. inland (A.C. Beauglehole 11880)*			
576.	48481	*Pterostylis tryphera*			
Orobanchaceae					
577.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
Otididae					
578.	24610	*Ardeotis australis (Australian Bustard)*			
Pachycephalidae					
579.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
580.	24618	*Oreoica gutturalis (Crested Bellbird)*			
581.	34011	*Oreoica gutturalis subsp. gutturalis (Crested Bellbird (southern))*			
582.	24619	*Pachycephala inornata (Gilbert's Whistler)*			
583.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
Pardalotidae					
584.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
585.	24625	*Pardalotus punctatus subsp. punctatus (Spotted Pardalote)*			
586.	25682	*Pardalotus striatus (Striated Pardalote)*			
Parmeliaceae					
587.	42107	*Austroparmelina elixiana*			
588.	28102	*Xanthoparmelia alternata*			
589.	28103	*Xanthoparmelia amphixantha*			
590.	28104	*Xanthoparmelia amplexula*			
591.	29032	*Xanthoparmelia imitatrix*			
592.	28326	*Xanthoparmelia incantata*			
593.	28143	*Xanthoparmelia incrustata*			
594.	30651	*Xanthoparmelia nodulosa*			
595.	28166	*Xanthoparmelia pertinax*			
596.	29036	*Xanthoparmelia pulla*			
597.	28172	*Xanthoparmelia reptans*			
598.	44326	*Xanthoparmelia rimalis*			
599.	28327	*Xanthoparmelia semiviridis*			
600.	28182	*Xanthoparmelia tasmanica*			
601.	28356	*Xanthoparmelia verrucella*			
602.	28186	*Xanthoparmelia versicolor*			
603.	18002	*Xanthoparmelia xanthomelanoides*		P2	
Petroicidae					
604.	24650	*Drymodes brunneopygia (Southern Scrub-robin)*			
605.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
606.	47997	*Melanodryas cucullata (Hooded Robin)*			
607.	25693	*Microeca fascinans (Jacky Winter)*			
608.	24659	*Petroica goodenovii (Red-capped Robin)*			
Phalacrocoracidae					
609.	25697	*Phalacrocorax carbo (Great Cormorant)*			
610.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
Phasianidae					
611.	24671	*Coturnix pectoralis (Stubble Quail)*			
612.	25701	*Coturnix ypsilophora (Brown Quail)*			
Pholcidae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
613.		*Trichocyclus balladong*			
Physciaceae					
614.	42104	*Buellia albula*			
Pittosporaceae					
615.	3168	*Cheiranthera filifolia*			
616.	19744	*Pittosporum angustifolium*			
617.	41300	*Pittosporum phillyreoides (Weeping Pittosporum, Yaliti)*			
Plantaginaceae					
618.	7300	*Plantago drummondii (Sago Weed)*			
Poaceae					
619.	207	*Aristida contorta (Bunched Kerosene Grass)*			
620.	17232	*Austrostipa blackii*		P3	
621.	17237	*Austrostipa elegantissima*			
622.	17238	*Austrostipa eremophila*			
623.	17241	*Austrostipa hemipogon*			
624.	17246	*Austrostipa nitida*			
625.	19588	*Austrostipa nodosa*			
626.	17247	*Austrostipa platychaeta*			
627.	17251	*Austrostipa scabra*			
628.		*Austrostipa sp.*			
629.	36283	*Austrostipa sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)*		P1	
630.	17255	*Austrostipa trichophylla*			
631.	245	*Briza minor (Shivery Grass)*	Y		
632.	368	*Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)*			
633.	521	*Paspalidium gracile (Slender Panic)*			
634.	40431	*Rytidosperma acerosum*			
635.	40425	*Rytidosperma caespitosum*			
636.	17881	*Triodia desertorum*			
637.	17874	*Triodia rigidissima*			
Podicipedidae					
638.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
639.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
Pomatostomidae					
640.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
641.	34013	*Pomatostomus superciliosus subsp. ashbyi (White-browed Babbler (western wheatbelt))*			
Pottiaceae					
642.	32346	*Didymodon torquatus*			
643.	32438	*Syntrichia pagorum*			
644.	32444	*Tortula atrovirens*			
Primulaceae					
645.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
Prodidomidae					
646.		*Myandra bicincta*			
Proteaceae					
647.	1946	*Grevillea acacioides*			
648.	1949	*Grevillea acuaria*			
649.	1971	*Grevillea cagiana (Red Toothbrushes)*			
650.	13453	*Grevillea didymobotrya subsp. didymobotrya*			
651.	8832	*Grevillea excelsior (Flame Grevillea)*			
652.	14413	*Grevillea haplantha subsp. haplantha*			
653.	19314	*Grevillea hookeriana subsp. apiciloba*			
654.	19435	*Grevillea hookeriana subsp. hookeriana*			
655.	2018	*Grevillea huegelii*			
656.	19541	*Grevillea nematophylla subsp. nematophylla*			
657.	2055	*Grevillea oncogyne*			
658.	19540	*Grevillea petrophiloides subsp. remota*		P3	
659.	2064	*Grevillea phillipsiana*		P1	
660.	19492	*Grevillea plurijuga subsp. plurijuga*			
661.	2077	*Grevillea pterosperma*			
662.	13458	*Grevillea sarissa subsp. sarissa*			
663.	2104	*Grevillea teretifolia (Round Leaf Grevillea)*			
664.	2157	*Hakea erecta*			
665.	2163	*Hakea francisiana (Emu Tree)*			
666.	2182	*Hakea minyma*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
667.	2259	*Persoonia coriacea (Leathery-leaf Persoonia)*			
668.	15628	*Persoonia helix*			
669.	14446	*Petrophile arcuata*			
Psittacidae					
670.		*Barnardius zonarius*			
671.	24736	*Melopsittacus undulatus (Budgerigar)*			
672.	24740	*Neophema splendida (Scarlet-chested Parrot)*			
673.	25720	*Platycercus icterotis (Western Rosella)*			
674.	24746	*Platycercus icterotis subsp. xanthogenys (Western Rosella (inland))*		P4	
675.	24748	*Platycercus varius (Mulga Parrot)*			
676.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
677.	25722	*Polytelis anthopeplus (Regent Parrot)*			
Psoraceae					
678.	28000	*Psora decipiens*			
Pteridaceae					
679.	12796	*Cheilanthes adiantoides*			
680.	31	*Cheilanthes austrotenuifolia*			
681.	37	*Cheilanthes lasiophylla (Woolly Cloak Fern)*			
682.	12818	*Cheilanthes sieberi subsp. sieberi*			
Pygopodidae					
683.	24995	*Delma australis*			
684.	24997	*Delma butleri*			
685.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
686.	25005	*Lialis burtonis*			
687.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
Rallidae					
688.	25727	*Fulica atra (Eurasian Coot)*			
689.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
Ranunculaceae					
690.	11643	*Ranunculus pentandrus var. platycarpus*			
Recurvirostridae					
691.	25734	*Himantopus himantopus (Black-winged Stilt)*			
Rhamnaceae					
692.	16183	*Cryptandra aridicola*			
693.	16184	*Cryptandra distigma*			
694.	16185	*Cryptandra graniticola*			
695.	16194	*Cryptandra recurva*			
696.	14427	*Granitites intangendus*			
697.	4815	*Pomaderris forrestiana*			
698.	16200	*Stenanthemum stipulosum*			
699.	16986	*Trymalium myrtillus subsp. myrtillus*			
Ricciaceae					
700.		*Riccia crinita*			
Rubiaceae					
701.	18255	*Opercularia vaginata (Dog Weed)*			
Rutaceae					
702.	16628	*Boronia fabianoides subsp. rosea*			
703.	15965	*Boronia inornata subsp. inornata*			
704.	15966	*Boronia inornata subsp. leptophylla*			
705.	4459	*Drummondita hassellii*			
706.	4498	*Phebalium clavatum*		P2	
707.	4501	*Phebalium lepidotum*			
708.	4504	*Phebalium tuberculosum*			
709.	18520	*Philotheca apiculata*		P1	
710.	18506	*Philotheca tomentella*			
Salticidae					
711.		*Clynotis albobarbatus*			
Santalaceae					
712.	10977	*Exocarpos aphyllus (Leafless Ballart)*			
713.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
714.	2356	*Santalum acuminatum (Quandong, Warnga)*			
715.	2359	*Santalum spicatum (Sandalwood, Wilarak)*			
Sapindaceae					

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
716.	4769	*Dodonaea lobulata (Bead Hopbush)*			
717.	12034	*Dodonaea microzyga var. acrolobata*			
718.	4780	*Dodonaea stenozyga*			
719.	4782	*Dodonaea viscosa (Sticky Hopbush)*			
720.	11247	*Dodonaea viscosa subsp. angustissima*			
Scincidae					
721.	30893	*Cryptoblepharus buchananii*			
722.	25026	*Ctenotus atlas*			
723.	25052	*Ctenotus leonhardii*			
724.	25074	*Ctenotus schomburgkii*			
725.	25089	*Cyclodomorphus melanops subsp. elongatus (Slender Blue-tongue)*			
726.	25092	*Egernia depressa (Southern Pygmy Spiny-tailed Skink)*			
727.	25109	*Eremiascincus richardsonii (Broad-banded Sand Swimmer)*			
728.	25115	*Hemiergis initialis subsp. initialis*			
729.	25117	*Hemiergis peronii subsp. peronii*			
730.	25131	*Lerista distinguenda*			
731.		*Lerista kingi*			
732.	25162	*Lerista picturata*			
733.	25173	*Lerista taeniata*			
734.	42411	*Lerista timida*			
735.	41411	*Liopholis inornata (Desert Skink)*			
736.	41413	*Liopholis multiscutata (Bull Skink)*			
737.	25184	*Menetia greyii*			
738.	25188	*Morethia adelaidensis*			
739.	25190	*Morethia butleri*			
740.	25192	*Morethia obscura*			
Scolopacidae					
741.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
Scolopendridae					
742.		*Cormocephalus turneri*			
743.		*Scolopendra laeta*			
Scrophulariaceae					
744.	14887	*Diocirea acutifolia*		P3	
745.	14889	*Diocirea violacea*			
746.	7180	*Eremophila alternifolia (Poverty Bush)*			
747.	31235	*Eremophila annosocaulis*		P3	
748.	16377	*Eremophila caerulea subsp. caerulea*			
749.	13641	*Eremophila caerulea subsp. merrallii*		P4	
750.	13807	*Eremophila caperata*			
751.	7189	*Eremophila clarkei (Turpentine Bush)*			
752.	17156	*Eremophila clavata*			
753.	14895	*Eremophila decipiens subsp. decipiens*			
754.	7195	*Eremophila dempsteri*			
755.	7198	*Eremophila deserti*			
756.	7212	*Eremophila gibbosa*			
757.	14340	*Eremophila glabra subsp. glabra*			
758.	7219	*Eremophila granitica (Thin-leaved Poverty Bush)*			
759.	15112	*Eremophila interstans subsp. interstans*			
760.	15111	*Eremophila interstans subsp. virgata*			
761.	7226	*Eremophila ionantha (Violet-flowered Eremophila)*			
762.	16363	*Eremophila maculata subsp. brevifolia (Native Fuchsia)*			
763.	15003	*Eremophila oldfieldii subsp. angustifolia*			
764.	18570	*Eremophila oppositifolia subsp. angustifolia*			
765.	14594	*Eremophila parvifolia subsp. auricampa*			
766.	14514	*Eremophila perglandulosa*		P1	
767.	14516	*Eremophila praecox*		P1	
768.	10780	*Eremophila psilocalyx*			
769.	15172	*Eremophila rugosa*			
770.	7264	*Eremophila saligna (Willowy Eremophila)*			
771.	7267	*Eremophila scoparia (Broom Bush ()*			
772.	7269	*Eremophila serrulata (Serrate-leaved Eremophila)*			
773.		*Eremophila sp.*			
774.	18259	*Myoporum platycarpum subsp. platycarpum*			
Scutigeridae					
775.		*Thereuopoda lesueurii*			
Solanaceae					
776.	6966	*Duboisia hopwoodii (Pituri, Kundugu)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
777.	6967	*Lycium australe (Australian Boxthorn)*			
778.	6974	*Nicotiana glauca (Tree Tobacco)*	Y		
779.	6975	*Nicotiana goodspeedii*			
780.	6978	*Nicotiana rotundifolia (Round-leaved Tobacco)*			
781.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
782.	7023	*Solanum nummularium (Money-leaved Solanum)*			
783.	7028	*Solanum petrophilum (Rock Nightshade)*			
784.	7030	*Solanum plicatile*			
785.	7034	*Solanum simile (Oondoroo)*			
Sparassidae					
786.		*Isopedella cana*			
Stylidiaceae					
787.	7685	*Stylidium arenicola*			
788.	7701	*Stylidium choreanthum (Dancing Triggerplant)*		P3	
789.	7714	*Stylidium dielsianum (Tangle Triggerplant)*			
790.	7719	*Stylidium ecorne (Foot Triggerplant)*			
791.	7740	*Stylidium induratum (Desert Triggerplant)*			
792.	7751	*Stylidium limbatum (Fringed-leaved Triggerplant)*			
793.		*Stylidium sp.*			
794.	46894	*Stylidium sp. Mt Bayly (J.A. Wege & C. Wilkins JAW 1986)*			
Teloschistaceae					
795.	44945	*Caloplaca hnatiukii*			
796.	28065	*Teloschistes chrysophthalmus*			
Thamnocephalidae					
797.	33933	*Branchinella basispina (fairy shrimp (Balladonia-Norseman))*		P3	
798.		*Branchinella longirostris*			
Theridiidae					
799.		*Latrodectus hasseltii*			
Thymelaeaceae					
800.	5231	*Pimelea angustifolia (Narrow-leaved Pimelea)*			
801.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
802.	11282	*Pimelea brevifolia subsp. brevifolia*			
803.	11185	*Pimelea microcephala subsp. microcephala*			
804.	12104	*Pimelea spiculigera var. thesioides*			
805.	5267	*Pimelea subvillifera*			
Typhaceae					
806.	99	*Typha orientalis (Bulrush, Cumbungi)*			
Urodacidae					
807.		*Urodacus novaehollandiae*			
Varanidae					
808.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
809.	25526	*Varanus tristis (Racehorse Monitor)*			
Verbenaceae					
810.	6733	*Lantana camara (Common Lantana)*	Y		
Vespertilionidae					
811.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
Violaceae					
812.	5220	*Hybanthus epacroides (Spiny Hybanthus)*			
813.	11973	*Hybanthus floribundus subsp. curvifolius*			
Zodariidae					
814.		*Storena formosa*			
Zosteropidae					
815.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
Zygophyllaceae					
816.	48882	*Roepera apiculata*			
817.	48891	*Roepera fruticulosa*			
818.	48892	*Roepera glauca (Pale Twinleaf, Pale Twin-leaf)*			
819.	48893	*Roepera halophila*			
820.	48898	*Roepera ovata*			
821.	48899	*Roepera reticulata*			

Conservation Codes

Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area

T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX I: EPBC PROTECTED MATTERS SEARCH (40KM BUFFER)

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

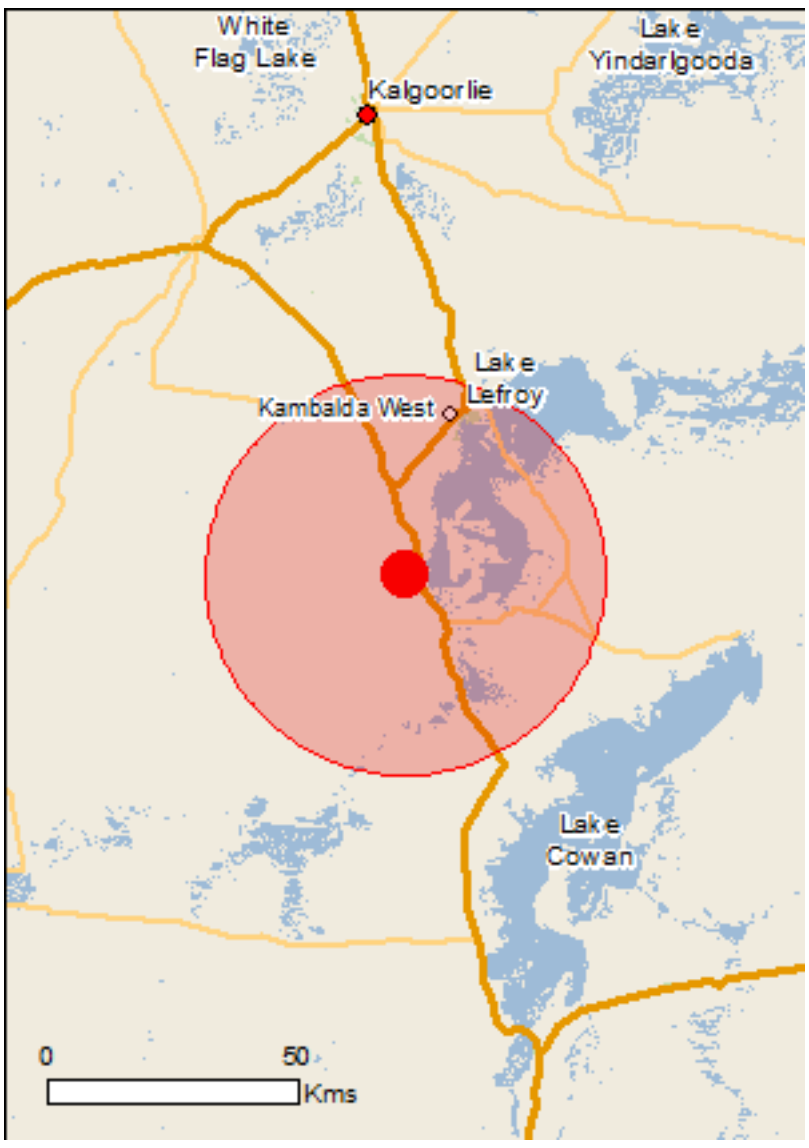
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/12/21 04:23:17

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



Coordinates

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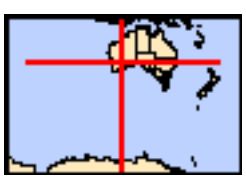

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	7
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	6
Regional Forest Agreements:	None
Invasive Species:	13
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Pezoporus occidentalis		
Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Plants		
Gastrolobium graniticum		
Granite Poison [14872]	Endangered	Species or species habitat may occur within area
Tecticornia flabelliformis		
Bead Glasswort [82664]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Thinornis rubricollis		
Hooded Plover [59510]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Binaronca	WA
Burra	WA
Dordie Rocks	WA
Kambalda	WA
Unnamed WA17804	WA
Yallari Timber Reserve	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis		
Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Camelus dromedarius		
Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Equus asinus		
Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua Ward's Weed [9511]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-31.45702 121.53822

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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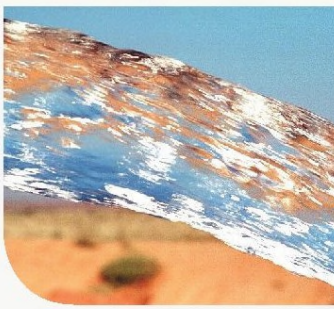

MUNDA DEPOSIT
WIDGIEMOOLTHA

HYDROLOGICAL & HYDROGEOLOGICAL ASSESSMENT

REPORT FOR
AURIC MINING LTD

AUGUST 2024

Rockwater
HYDROGEOLOGICAL AND ENVIRONMENTAL CONSULTANTS

Report No. 597-0/24/01a

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Appendix

I IFD Chart and Tables

REVISION	AUTHOR	REVIEW	AUTHORISED	ISSUED
0	PHW	JRP	PHW	22/08/2024
1	PHW			22/08/2024

1 INTRODUCTION

Auric Mining Limited is planning to mine gold at its Munda deposit, located 5 km west of Widgiemooltha and 80 km south of Kalgoorlie (Figure 1). Rockwater was engaged to conduct a hydrogeological assessment of the deposit and the planned initial mine pit, including dewatering requirements, the impacts of dewatering, potential targets for water for dust suppression and to define the nature of the final mine void. Also, the risk of flooding of the pit by surface water runoff was to be addressed.

This report presents the data collected and the results of the desk-top hydrological and hydrogeological assessment, to be used in mine planning and in obtaining approvals for the project.

2 SURFACE WATER HYDROLOGY

2.1 TOPOGRAPHY AND DRAINAGE

The planned Munda pit lies on or close to a drainage divide (Fig. 2), and so there is limited potential for surface runoff to affect the pit. The site mostly drains to the east and south towards a drainage line that flows to a salt lake. The topographic data, provided by Auric Mining, indicate that there are two small catchments (labelled A and B) that could result in runoff towards the pit, as shown in Figure 2.

2.2 CLIMATE

The Munda deposit is located within the Arid Region as delineated in Australian Rainfall and Runoff 1987. The nearest Bureau of Meteorology (BoM) station with a long data-record is at Woolibar Station (Stn. 012106), located 50 km north of the project site.

Rainfall at Woolibar was recorded from 1900 to 1907 and 1952 to 2020. The long-term mean annual rainfall is 255 mm, with average monthly rainfalls fairly evenly distributed and ranging from 17.1 mm in November to 32.7 mm in February (Table 1). Rainfall over the winter months is generally associated with the passage of cold fronts from May through to July. Summer rainfall is highly erratic, and generally results from thunderstorms.

Table 1: Average rainfalls at Woolibar, and Dam Evaporation Norseman (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall	31.5	32.7	21.3	17.8	27.2	22.2	23.7	19.2	17.2	14.6	17.1	19.8	255.0
Dam Evap.	278	214	182	125	81	59	69	78	108	158	200	250	1,802

Average dam evaporation for Norseman, 86 km to the south (Luke, Burke, and O'Brien, 1988), is also given in Table 1. It exceeds average rainfall in all months, and by a factor of seven overall.

Monthly mean maximum temperatures at Norseman range from 17.4 °C in July to 32.6 °C in January; and monthly mean minimum temperatures range from 4.1 °C in July to 16.1 °C in February.

2.3 FLOOD FLOW ESTIMATES

2.3.1 RAINFALL ANALYSIS

The methods given in the Australian Rainfall and Runoff 1987 guidelines (Pilgrim et. al., 1987) were used for hydrological analysis of the Munda catchments at the project site, to predict peak flood flows. It should be

noted that a revision of the guidelines (ARR, 2019) was published to replace the 1987 version. However, the new publication uses the Regional Flood Frequency Estimation (RFFE) model, which is not applicable for the arid region of WA, and so was not used in this assessment.

Intensity-Frequency-Duration (IFD) curves for the project area were obtained from the Bureau of Meteorology web site, and are based on the statistical and meteorological analyses given in the ARR 1987 Guideline (Pilgrim et. al., 1987). The IFD tables and curves are included in Appendix I.

2.3.2 CATCHMENT CHARACTERISTICS

The catchments are shown in Fig. 2; and their characteristics are summarised in Table 2.

Table 2: Catchment Characteristics

Catchment	Area (km^2)	Mainstream Length (km)
A	0.0066	0.16
B	0.0078	0.16

2.3.3 TIME OF CONCENTRATION

The time of concentration is required to estimate the critical storm duration for peak flows in the catchment. This was estimated using Equation 1 for the Arid Interior Region of Western Australia as recommended by ARR 1987 and later editions:

$$t_c = 0.76 \cdot A^{0.38} \qquad \textit{Equation 1}$$

Where:

t_c	*is the time of concentration (hours)*
A	*is the catchment area (km^2)*

2.3.4 RATIONAL METHOD

The Statistical Rational Method, used in peak-flow estimation, is presented in Equation 2.

$$Q_y = 0.278 \cdot C_y \cdot I_{tcy} \cdot A \qquad \textit{Equation 2}$$

Where:

Q_y	is the peak flow for return period of y years (m^3/s)
0.278	is a dimensionless metric conversion factor
C_y	is the runoff coefficient for y years (dimensionless)
I_{tcy}	is rainfall intensity (mm/hr)
A	is catchment area (km^2)

2.3.5 FLOOD INDEX METHOD

The Australian Rainfall and Runoff Guideline (1987) does not provide equations for peak flow estimation using the flood index method for the Arid Region. However, the Munda area is similar to the Wheatbelt with loamy soils, and so the Flood Index Method for that region, presented in Equation 3, was used for comparative purposes.

They are estimated to be: $Q_5 = 2.77 \times 10^{-6} \cdot \mathrm{A}^{0.52} \cdot \mathrm{P}^{2.12}$ ***Equation 3***

Where:

Q_5	*is the peak discharge for the 5-year ARI flow (m^3/s)*
A	*is the catchment area (km^2)*
p	*average annual rainfall (mm)*

2.3.6 PEAK FLOWS

Design peak flows for the catchments, as estimated using the Rational and Flood Index Methods, are given in Table 3.

Table 3: Estimated Peak Flows (m^3/s)

Catchment A:

ARI Years	2	5	10	20	50	100
Rational	0.02	0.06	0.11	0.18	0.30	0.42
Index	0.01	0.02	0.04	0.06	0.11	0.20
Adopted	0.02	0.06	0.11	0.18	0.30	0.42

Catchment B:

ARI Years	2	5	10	20	50	100
Rational	0.03	0.07	0.13	0.21	0.34	0.48
Index	0.01	0.02	0.04	0.07	0.13	0.22
Adopted	0.03	0.07	0.13	0.21	0.34	0.48

The sizes of the catchments are similar, and so the peak flows are similar (and small), being about 0.4 to 0.5 m^3/s for the 1-in-100 year flood. The flows would also recede rapidly.

2.4 IMPACT OF FLOOD FLOWS ON THE PROJECT AREA

Peak flows in the catchments for 100-year ARI and PMF events were analysed to assess whether they could adversely impact the initial Munda pit.

Flows from Catchment A can be controlled by the usual safety bund around the pit, and would be directed along the bund to both the north and south and away from the pit. Even without the bund, most runoff from the catchment would flow to the north or south, and not towards the pit.

Flows from Catchment B could also be controlled by the safety bund, but the ground on the outside (eastern side) of the bund should be graded to slope evenly down to the north over a width of about 10 m along the line shown in Fig. 2. This would prevent ponding in the flat area on the eastern side of the planned pit. Hydraulic calculations using Manning's equation (Table 4) indicate that in a 1-in-100 year rainfall event, runoff from the catchment would flow along the bund to the north over a width of about 8.4 m, and with a maximum depth at the bund of about 0.21 m.

Table 4: Results of Hydraulic Calculations

Stage at bund (m)	Flow Width (m)	A (m^2)	P (m)	Manning's n	Slope (m/m)	V (m/s)	Q (m^3/s)
0.00	0	0	0	0.06	0.023	0.00	0.00
0.10	4	0	4	0.06	0.023	0.33	0.07
0.20	8	1	8	0.06	0.023	0.53	0.42
0.30	12	2	13	0.06	0.023	0.69	1.24

(100-Y Peak Discharge = 0.48 m^3/s, = 0.21 m max. depth, V = 0.55 m/s)

The maximum flow velocity would be low, about 0.55 m/s, and should not cause any significant scouring of the bund.

3 HYDROGEOLOGICAL ASSESSMENT

3.1 MINING HISTORY

Resolute Limited excavated a small trial pit in 1999 to a depth of about 20 m. The pit was above the water table and remains dry. Mining was abandoned due to difficulties in identifying mineralization during mining, and poor down-dip continuity of the mineralization (Resolute, 2000).

3.2 GEOLOGY

The 1:100 000 geological sheet (Griffin, 1988) shows the deposit area to be near the contact between high Mg metabasalt (mafic) to the south and meta-komatiite (ultramafic) to the north, with a variable strike but generally east to west, and a dip of 45 to 70 degrees north.

Information and geological sections provided by Auric Mining indicate that the deposit lies along the sheared mafic/ultramafic contact, and a north-easterly cross-cutting structure – a fault/shear zone. The contact dips to the north at about 45 degrees.

There are numerous quartz veins and pegmatites in the shear zone; and there is an east-west Proterozoic dolerite north of the deposit.

The depth to fresh rock ranges from 1 m to 78 m, with shallow depths in unmineralised basalt, and greater depths within mineralised rocks and the ultramafic.

3.3 HYDROGEOLOGY

3.3.1 WATER INFORMATION REPORTING DATA

There are no useful hydrogeological data for the project area in the Department of Water and Environmental Regulation (DWER) Water Information Reporting (WIR) database. The closest well or bore recorded in the database is Mabie Well, located 8 km to the north of Munda (Fig. 3), and the data for that well is limited to its depth.

3.3.2 AQUIFER CHARACTERISTICS

Some useful hydrogeological data are recorded on the logs of the 55 AMRC-series reverse-circulation drillholes at the deposit drilled by Auric Mining. For many of the holes, the cuttings samples were dry, indicating low permeability (hydraulic conductivity).

Water information from the logs, including drillholes that had some wet samples or water flow measurements, is shown in Figure 4. There are four drillholes west of the deposit that had deep zones with wet samples; and several holes to the east where flows of up to 0.8 L/s and a hole with “lots of water” were recorded.

There were no indications of groundwater flows from drillholes within the planned trial pit area; and falling-head permeability tests that were conducted on four drillholes that intersected the mineralised rocks and

mafic/ultramafic contact were said to have low to very low permeability (Resolute Limited, 1999; marked as “Low K” in Fig. 4).

Core photos were provided for two diamond drillholes, EMD001 and EMD002. EMD001 had broken zones from 58 to 58.7 m, 79.5 to 80.2 m, and 86 to 89 m (including a mineralised zone). EMD002 had broken zones from 63 to 65.5 m and 68 to 70.5 m; and ferruginised joints from 75 to 76 m. The positions of the tops of these zones are shown in Fig. 4 as “Top of K”. They closely coincide with one of the falling-head test intervals, and so are likely to be of low permeability. Also, the broken zones are outside of the planned pit area.

In summary, all the noted indications are that the planned pit will intersect rocks of low permeability.

3.3.3 GROUNDWATER LEVELS, FLOW DIRECTIONS

There are no water-level data (in the WIR database) that can be used to determine regional groundwater levels and flow patterns, although it is expected that directions of groundwater flow will generally follow the topography, with groundwater discharging to the Lake Lefroy salt lake system, lying to the east.

Groundwater levels were measured in several drillholes in and around the Munda deposit in 1999, and in a number of other holes in 2023 or 2024. These have been corrected for drillhole dips and azimuths, and used to prepare a contour plot of groundwater elevations (Fig. 5). A few anomalous values were not used in the contouring – those values are in brackets. Elevations of the groundwater static water levels slope downwards from south to north from about 358 to 318 m AHD through the deposit area – a distance of about 200 m. The results indicate that the groundwater is flowing northwards under a steep hydraulic gradient. There is possibly also a small component of flow to the south or south-west from the planned mining area.

The groundwater elevations suggest that the water table ranges in depth (below ground surface) from about 27 m on the southern side of the planned pit, to 60 m on the northern side. The steepness of the hydraulic gradient gives further evidence of very low hydraulic conductivities.

3.3.4 GROUNDWATER QUALITY

Salinity measurements were made in 1999 for water from six drillholes (Resolute, 1999), and in 2024 for water from four other holes. The results are plotted in Figure 6, and show that groundwater salinities in the Munda deposit area cover a wide range, from 370 to 13,900 mg/L TDS and average about 4,000 mg/L TDS.

The lowest value might have resulted from rainfall runoff into an open drillhole; and the higher salinities and variability again reflect the low hydraulic conductivity and low rates of recharge for rocks in the area.

4 DEWATERING ASSESSMENT

A simple numerical groundwater model was constructed to estimate dewatering flows and impacts during mining of the trial pit. The model consists of a rectangular grid of 33 rows, 23 columns and a single layer covering an area of 1 km east-west and 1.5 km north-south. It utilises Processing Modflow Pro, finite-difference groundwater flow modelling software that includes Modflow-96, designed by the U.S. Geological Survey (McDonald and Harbaugh, 1988). Model cell sizes range from 25 m x 25 m in the planned pit area, to 50 m x 50 m in outer parts.

Hydraulic conductivity values were varied to obtain an approximate match between model-calculated and observed, pre-mining groundwater levels. Adopted model parameters are given in Table 5.

Table 5: Parameters of Numerical Groundwater Model

Parameter	Units	Nth Ultramafic	Central Pit Zone	Southern Mafic
Model Top	(m AHD)	45 m above initial groundwater levels		
Aquifer Base	(m AHD)	40 m below initial groundwater levels		
Initial WLS	(m AHD)	From 260 m Nth boundary, to 390 m Sth boundary		
Hydraulic Conductivity	(m/d)	0.002	0.001	0.005
Specific Yield	(v/v)	0.01	0.01	0.01
Model Boundaries		Constant head northern and southern; no-flow east and west		

4.1 DEWATERING FLOWS

It is planned to mine the trial pit down to an elevation of 320 m AHD, 60 m below ground level. This would require groundwater levels to be lowered by up to 33 m (near the southern side of the pit).

Dewatering flows were estimated using the model described above, and assuming that the pit will be mined over a nine month period. Modflow's Drain package was used to simulate dewatering. There would be no groundwater inflow until the pit extends down to about 354 m AHD. For the remainder of the period of mining, dewatering flows are indicated to average about 11 m^3/d, increasing to about 30 m^3/d towards the end of mining.

4.2 POTENTIAL IMPACTS OF MINING

Model-calculated groundwater-level drawdowns at the end of mining are shown in Fig. 7. They are indicated to extend about 180 m north and south of the pit, and 70 m to the east and west.

There are no other groundwater users, or groundwater-dependent vegetation that could be impacted by the dewatering.

4.3 NATURE OF FINAL VOID

A water-balance calculation for the planned trial pit (Table 6) gives an estimate of the final pit lake level. The calculations assume the following: that 80 % of the average rainfall within the pit perimeter reaches the lake; evaporation from the lake at the dam evaporation is at the rate given in Luke, Burke and O'Brien (1988); and groundwater inflows are as estimated by the numerical model.

Table 6: Final Void Water Balance, Munda Trial Pit

Pit Lake Elev. (m AHD)	Pit Lake Area (m^2)	Rainfall Gain (m^3/d)	Evap. Loss (m^3/d)	GW Inflows (m^3/d)	Balance (m^3/d)
380	21,293	12		Pit Perimeter	
350	4,860	12	24	0.2	-12
340	2,110	12	10	1.2	3
330	327	12	2	2.0	12
325	66	12	0	2.2	14

A zero value for the balance term - interpolated from the final column of Table 6 – is indicated to occur at a lake level of 342.1 m AHD; this would be 12 m below the average pre-mining (static) groundwater level. The

final void is, therefore, indicated to be a permanent groundwater sink. Water in the pit lake will gradually increase in salinity, but there will be no seepage from the pit lake back into the surrounding groundwater.

4.4 TARGETS FOR ADDITIONAL WATER SUPPLIES

Dewatering flows are expected to be very low, and so additional water would be needed for dust suppression – probably at least 300 m^3/d. Potential targets for the water are listed in Table 7 and are shown in Fig. 8.

Table 7: Targets for Potential Water Supply

Site	mE	mN	Description
Pit 1	362915	6515420	Pit containing water (Flinders?)
Pit 2	363610	6514710	Pit containing water
EX1	360894	6513819	Water zone intersected in AMRC020, 034
EX2	360459	6513800	Broken zone in EMD002
EX3	360355	6514200	Lineament intersection
EX4	359100	6512194	Lineament intersection on porphyry
EX5	361030	6512850	Northerly drainage line
EX6	360350	6514660	Slate and shale outcrop
132N	361160	6518840	132N Pit containing 200,000 m^3 water

Two pits, believed to be at the Flinders mine-site controlled by Mincor Resources, are 3 km from Munda and contain water that would probably be more than sufficient for the Munda project, provided access can be obtained.

132N pit, 3.2 km north of Munda and held by WIN Metals is likely to be available as a water supply, and is reported to contain 200,000 m^3 of water.

Potential targets for groundwater exploration (EX1 to EX6) are also given; at least some of these are on Auric tenements.

5 CONCLUSIONS

Flood-water flows from two small catchments have the potential to impact the planned Munda pit, however the peak flows are indicated to be small and of short duration, and can largely be controlled by the usual safety bund around the pit. It is recommended that the ground on the outside (eastern side) of the bund should be graded to slope evenly down to the north to prevent ponding of water behind the bund.

There were no indications of groundwater flows during drilling within the planned trial pit area. Falling-head permeability tests that were conducted on four drillholes that intersected the mineralised rocks and the mafic/ultramafic contact were said to have low to very low hydraulic conductivity, and this is likely to be the case for all rocks within the planned pit area.

Groundwater levels measured in drillholes in and around the Munda deposit indicate that the groundwater is flowing northwards under a steep hydraulic gradient, and that the water table depth ranges from about 27 m on the southern side of the planned pit to 60 m on the northern side. The steepness of the hydraulic gradient gives further evidence of very low hydraulic conductivities.

Groundwater salinities in the deposit area are highly variable, ranging from 370 to 13,900 mg/L TDS and averaging about 4,000 mg/L TDS. The low value might have resulted from rainfall runoff into an open

drillhole; and the higher salinities and variability again reflect the low hydraulic conductivity and low rates of groundwater recharge.

It is planned to mine the trial pit to a depth of 60 m below ground level. This would require groundwater levels to be lowered by up to 33 m (near the southern side of the pit). Dewatering inflows were estimated using a simple numerical model with low values of hydraulic conductivity. They are indicated to be very low, with an average about 11 m^3/d, increasing to about 30 m^3/d towards the end of mining.

The impacts of dewatering should be restricted to the immediate area of mining (less than 200 m from the pit. There are no other groundwater users, or groundwater-dependent vegetation that are likely to be impacted by the dewatering.

A water-balance calculation including groundwater inflows estimated by the numerical model indicates that the steady-state water level in the final mine void would be about 12 m below the ore-mining groundwater level, and that the void would be a permanent groundwater sink. Water in the pit lake would gradually increase in salinity, but there will be no seepage from the pit lake back into the surrounding groundwater.

Additional water for dust suppression could be sourced from existing mine pits, 3 km east and 3 km north of Munda, if access can be arranged. Also, some potential sites for groundwater exploration have been identified near the planned pit.

Dated: 22 August 2024 **Rockwater Pty Ltd**

P H Wharton
Principal

REFERENCES

Australian Rainfall and Runoff (ARR 2019) http://arr.ga.gov.au/arr-guideline

Griffin, T.J., 1988, Cowan WA Sheet 3234, Geological Survey of W.A. 1:100,000 Geological Series.

Luke, G.J., Burke, K.L., and O'Brien, T.M., 1988, Evaporation data for Western Australia. Tech. Report No. 65 (2nd Ed), W.A. Dept. of Agriculture.\

McDonald, M.G., and W.A. Harbaugh, 1988, MODFLOW, A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model. U.S. Geological Survey, Washington, DC. (A:3980), open file report 83–875, Chapter A1.

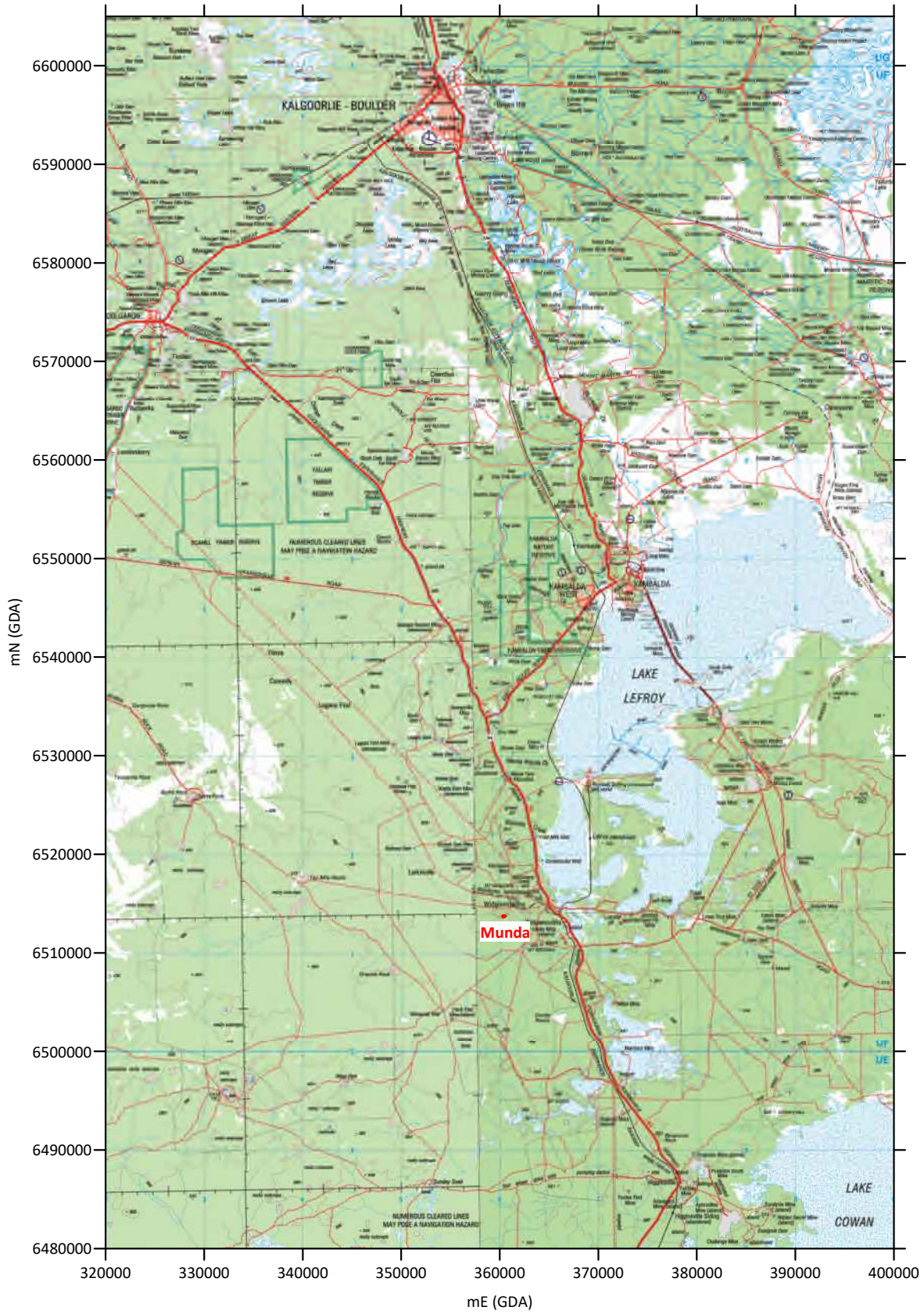
Pilgrim, D.H., et al, 1987, (AR&R 1987) Australian Rainfall and Runoff. The Institution of Engineers, Australia.

Resolute Limited, 1999, Chalice Gold Project, Munda open pit project, Notice of Intent.

Resolute Limited, 2000, Chalice Gold Project annual report.

FIGURES

FIGURE 1



locality.srf

CLIENT: Auric Mining

PROJECT: Munda

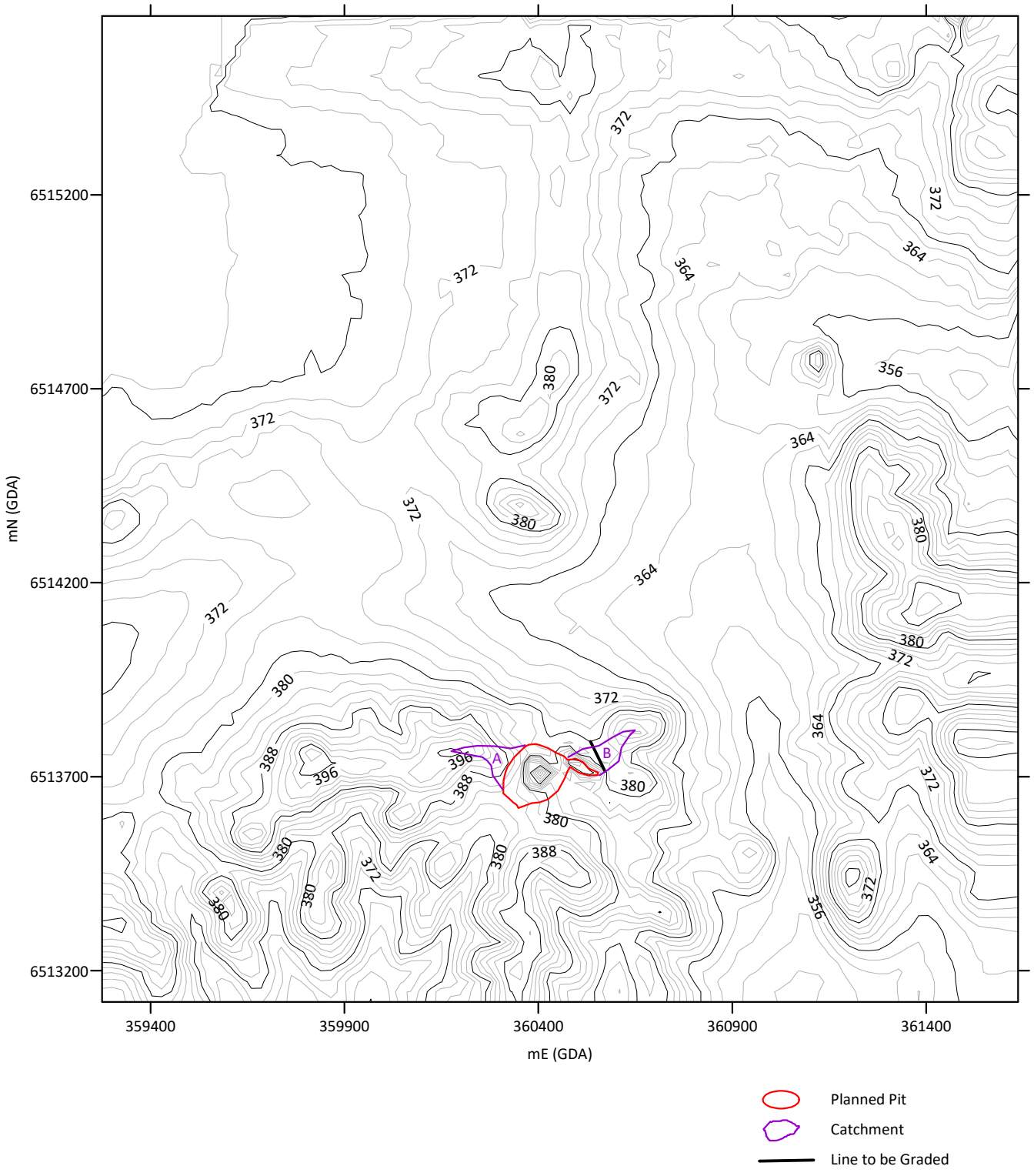
DATE: August 2024

Dwg No: 597-0/24/1-1

LOCALITY MAP

Rockwater Pty Ltd

FIGURE 2



local topo.srf

CLIENT: Auric Mining

PROJECT: Munda

DATE: August 2024

Dwg No: 597-0/24/1-2

TOPOGRAPHIC CONTOURS, CATCHMEMTS, &

LINE TO BE GRADED

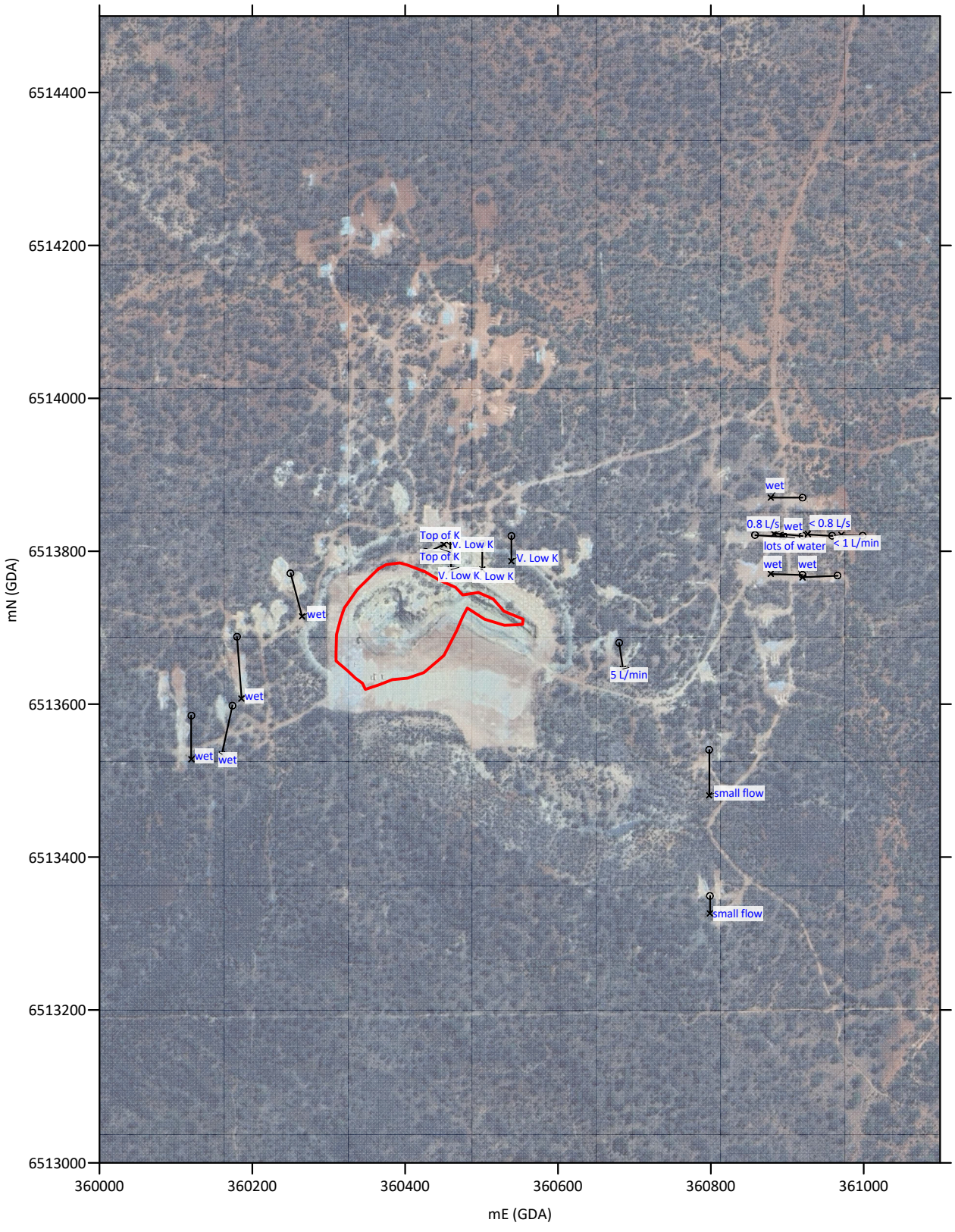
Rockwater Pty Ltd

FIGURE 3

wir bores.srf

CLIENT: Auric Mining	BORE LOCATIONS, WIR DATABASE
PROJECT: Munda	
DATE: August 2024	
Dwg No: 597-0/24/1-3	Rockwater Pty Ltd

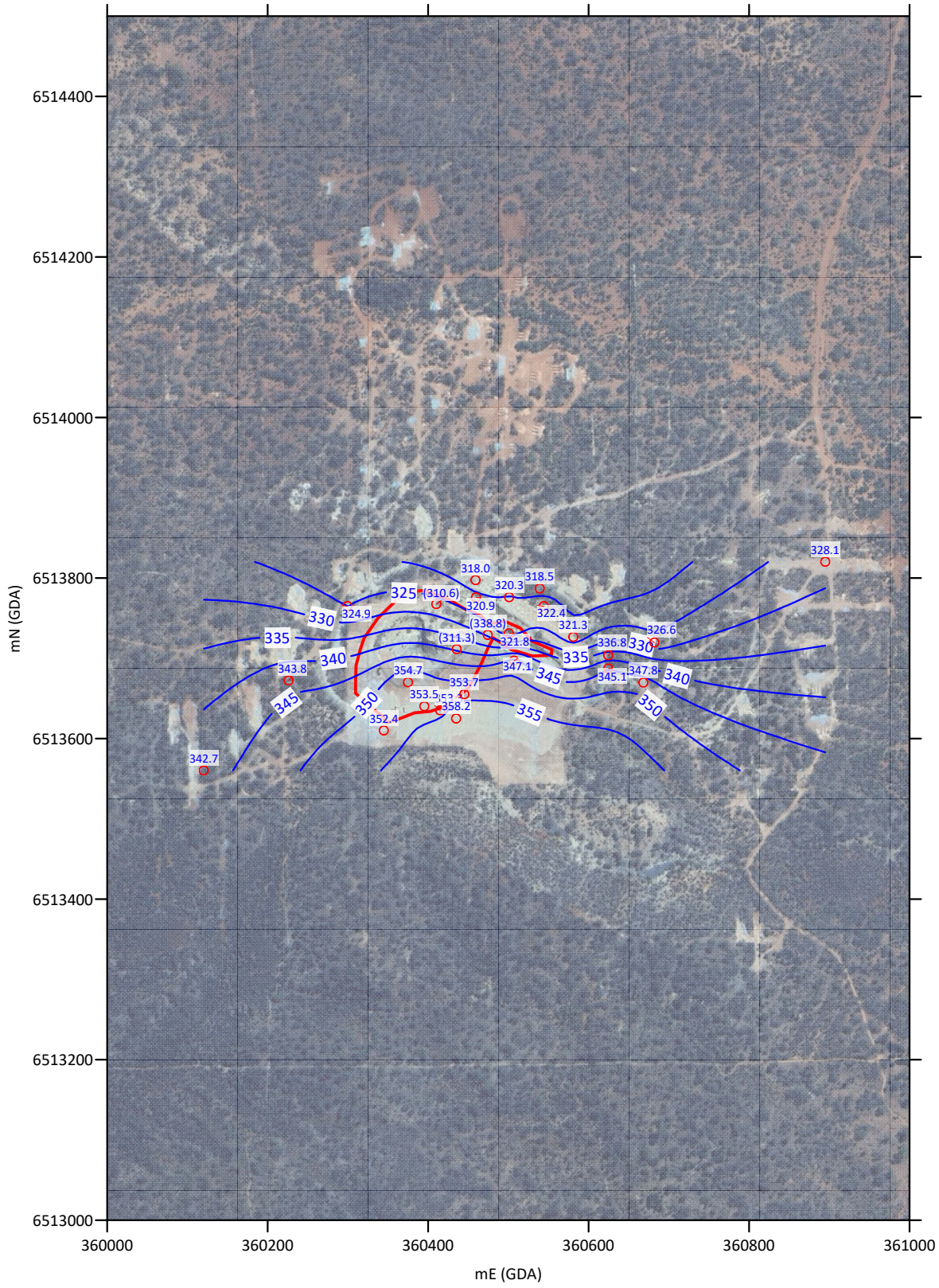
FIGURE 4



water info holes.srf

CLIENT: Auric Mining	DRILLHOLES WITH WATER INFORMATION
PROJECT: Munda	
DATE: August 2024	
Dwg No: 597-0/24/1-4	Rockwater Pty Ltd

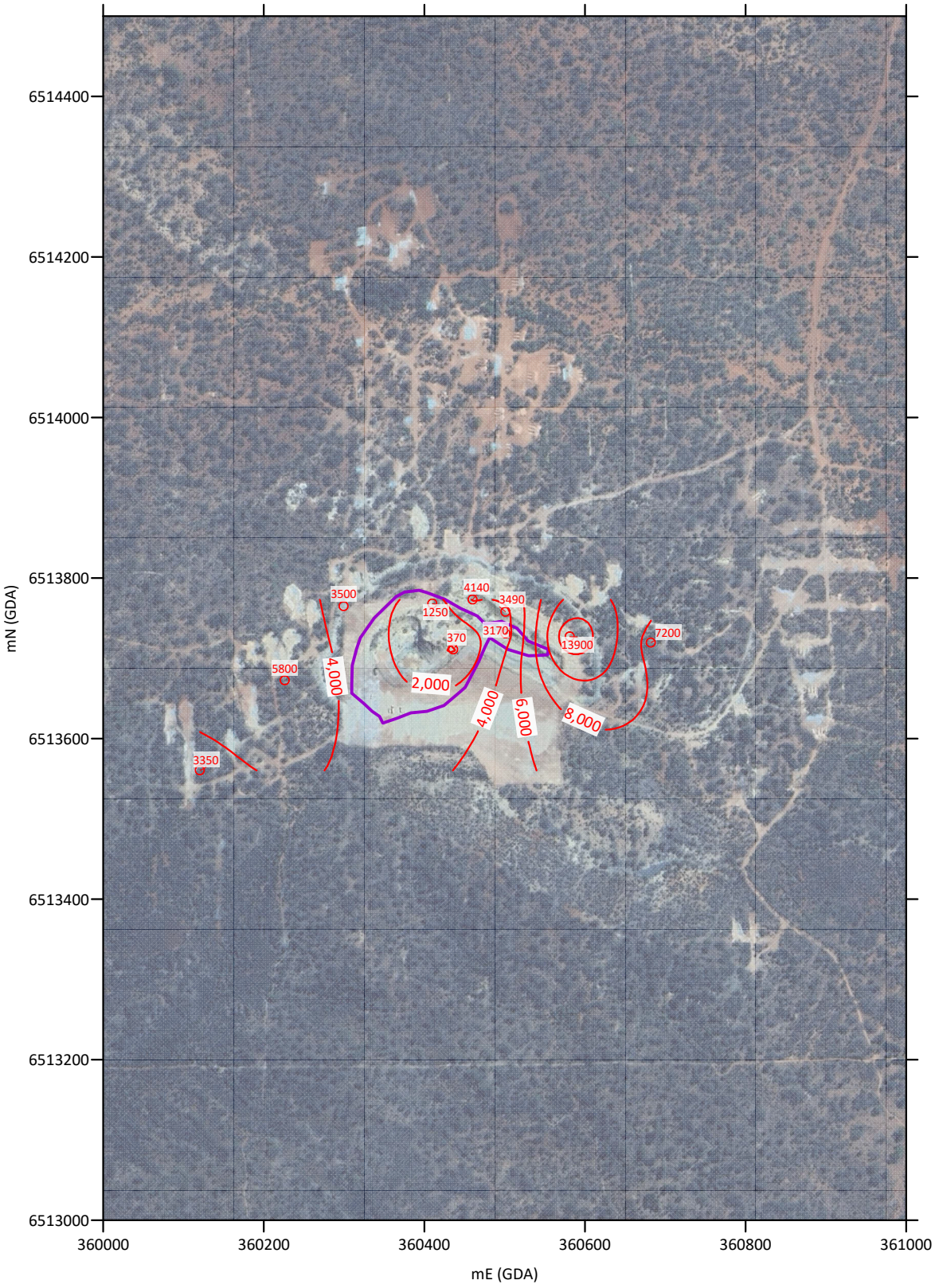
FIGURE 5



rlwls.srf

CLIENT: Auric Mining	SITE GROUNDWATER LEVELS (m AHD)
PROJECT: Munda	
DATE: August 2024	
Dwg No: 597-0/24/1-5	Rockwater Pty Ltd

FIGURE 6



salinities.srf

CLIENT: Auric Mining

PROJECT: Munda

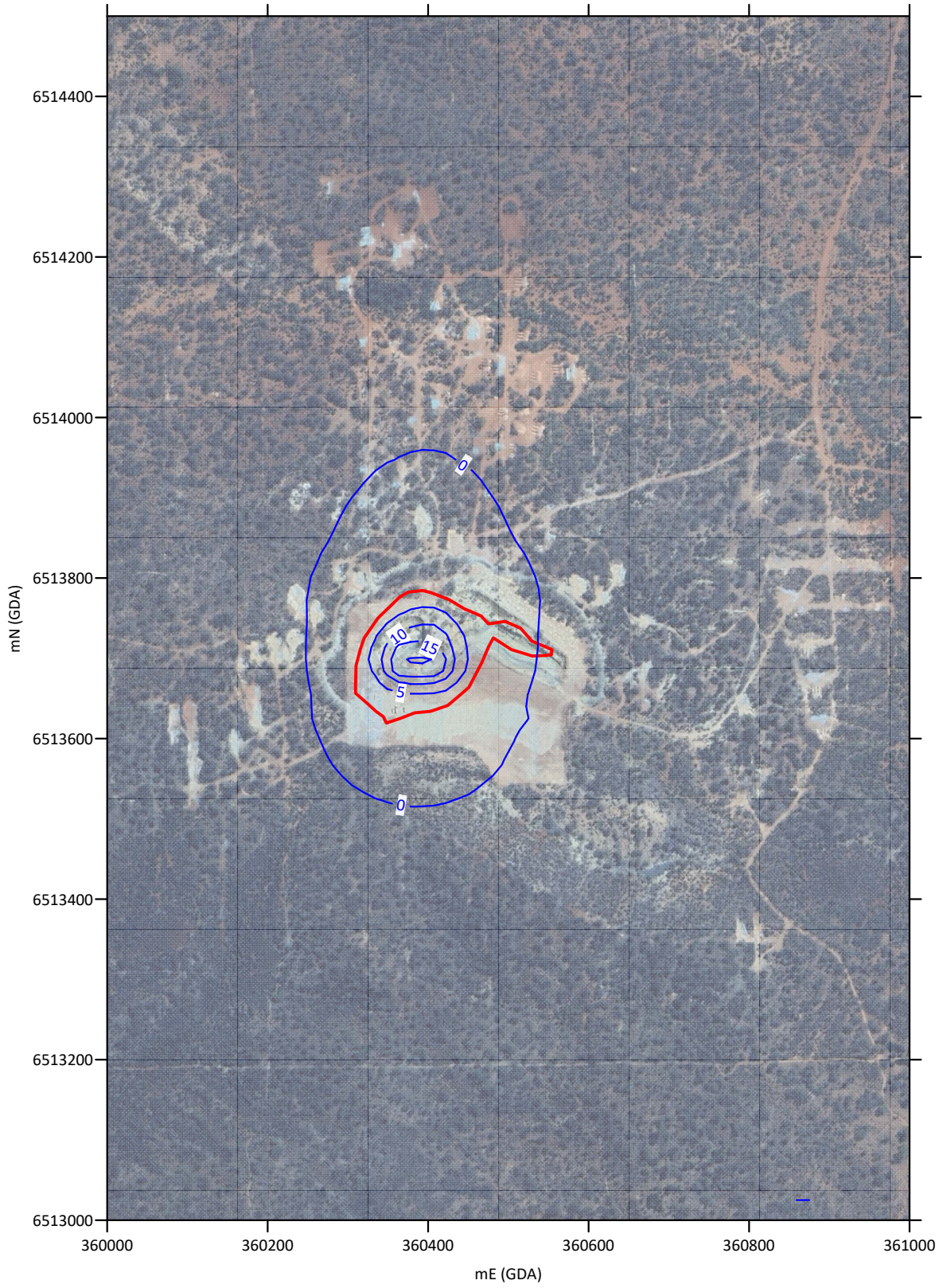
DATE: August 2024

Dwg No: 597-0/24/1-6

SITE GROUNDWATER SALINITY (mg/L TDS)

Rockwater Pty Ltd

FIGURE 7



calc dds.srf

CLIENT: Auric Mining

PROJECT: Munda

DATE: August 2024

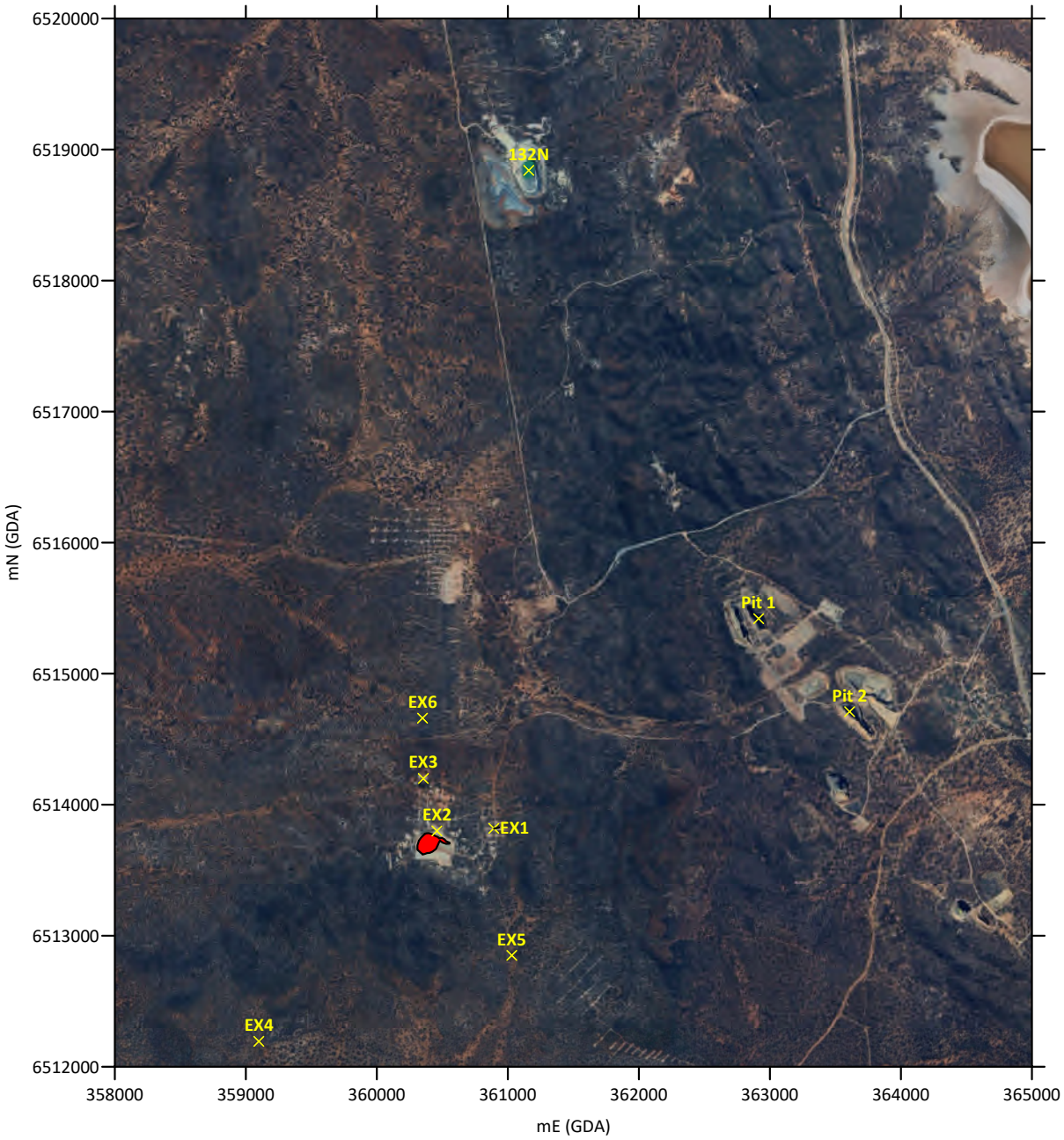
Dwg No: 597-0/24/1-7

MODEL-CALCULATED DRAWDOWNS (m)

END OF MINING

Rockwater Pty Ltd

FIGURE 8



water targets.srf

CLIENT: Auric Mining

PROJECT: Munda

DATE: August 2024

Dwg No: 597-0/24/1-8

TARGETS FOR WATER SUPPLY

Rockwater Pty Ltd

APPENDIX I: IFD CURVES & TABLES

LOCATION 31.500 S 121.525 E * NEAR.. Munda

LIST OF COEFFICIENTS TO EQUATIONS OF THE FORM

$$ln(I) = A + B \times (ln(T)) + C \times (ln(T))^2 + D \times (ln(T))^3 + E \times (ln(T))^4 + F \times (ln(T))^5 + G \times (ln(T))^6$$

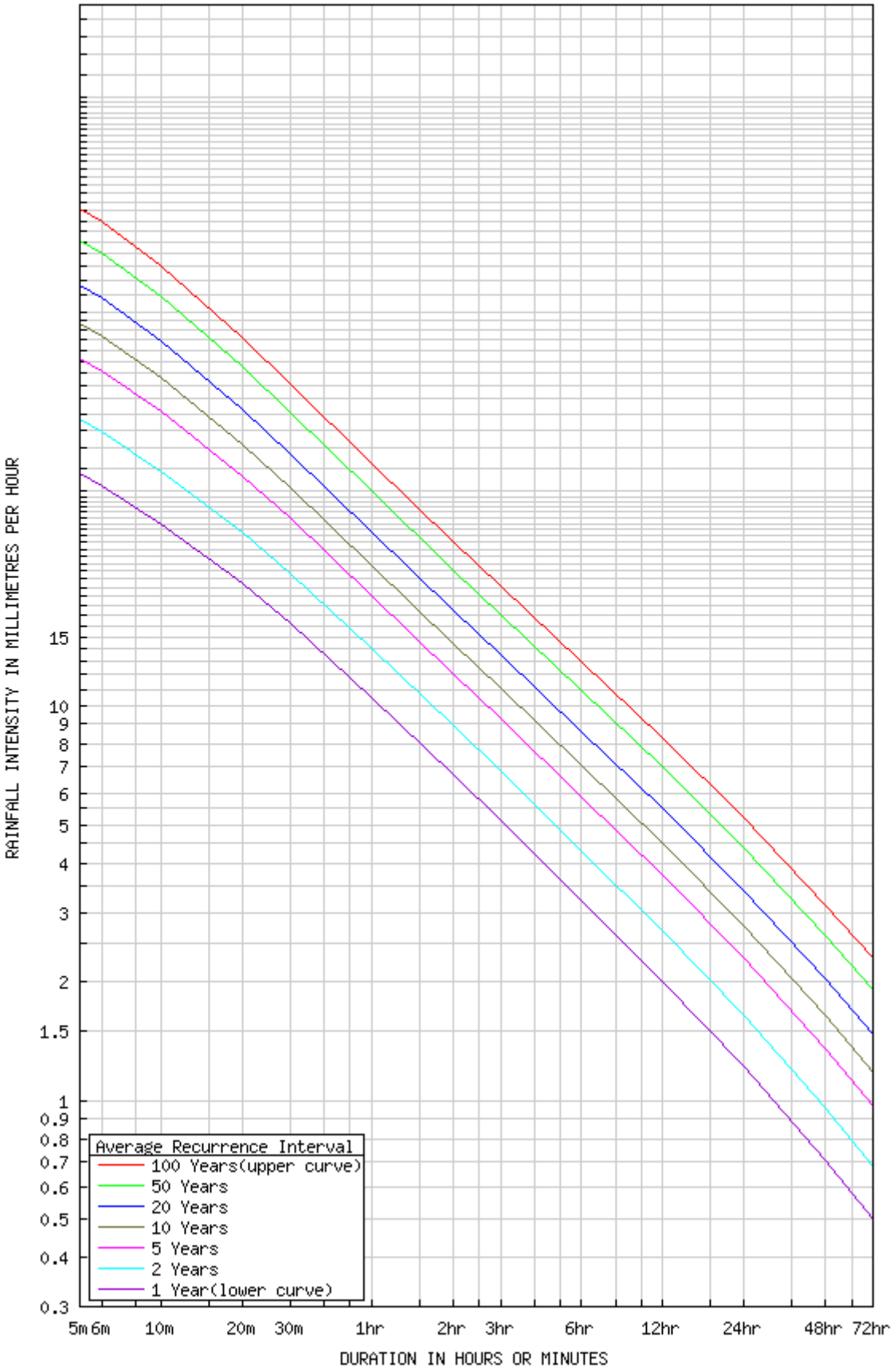
T = TIME IN HOURS AND I = INTENSITY IN MILLIMETRES PER HOUR

RETURN PERIOD	A	B	C	D	E	F	G
1	2.353103	-0.64110E+0	-0.24702E-1	0.97780E-2	-0.91191E-3	-0.46056E-3	0.56865E-4
2	2.641761	-0.64525E+0	-0.19874E-1	0.97220E-2	-0.13248E-2	-0.39751E-3	0.56918E-4
5	2.951925	-0.65307E+0	-0.10297E-1	0.88407E-2	-0.19278E-2	-0.23465E-3	0.47314E-4
10	3.125666	-0.65780E+0	-0.45799E-2	0.83083E-2	-0.23074E-2	-0.12940E-3	0.40131E-4
20	3.321388	-0.66237E+0	0.35475E-3	0.84203E-2	-0.27224E-2	-0.11489E-3	0.50452E-4
50	3.555230	-0.66717E+0	0.61615E-2	0.76962E-2	-0.30621E-2	0.15579E-4	0.38350E-4
100	3.719176	-0.67035E+0	0.10232E-1	0.71827E-2	-0.32952E-2	0.10342E-3	0.30083E-4

RAINFALL INTENSITY IN mm/h FOR VARIOUS DURATIONS AND RETURN PERIODS

RETURN PERIOD (YEARS)

DURATION	1	2	5	10	20	50	100
5 mins	39.1	53.2	76.4	93.5	117.	152.	183.
6 mins	36.3	49.4	70.9	86.8	108.	141.	170.
10 mins	29.0	39.4	55.9	68.2	84.5	109.	131.
20 mins	20.4	27.5	38.2	46.0	56.5	72.3	85.9
30 mins	16.2	21.7	29.9	35.7	43.7	55.6	65.7
1 hour	10.5	14.0	19.1	22.8	27.7	35.0	41.2
2 hours	6.68	8.92	12.1	14.4	17.5	22.1	26.1
3 hours	5.10	6.82	9.31	11.1	13.5	17.0	20.1
6 hours	3.21	4.30	5.91	7.07	8.63	11.0	13.0
12 hours	2.00	2.69	3.73	4.48	5.50	7.01	8.31
24 hours	1.22	1.64	2.30	2.77	3.41	4.38	5.21
48 hours	.708	.959	1.36	1.64	2.03	2.63	3.14
72 hours	.501	.681	.971	1.18	1.47	1.91	2.30


RAINFALL INTENSITY IN MILLIMETRES PER HOUR
15
10
9
8
7
6
5
4
3
2
1.5
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
Average Recurrence Interval
100 Years(upper curve)
50 Years
20 Years
10 Years
5 Years
2 Years
1 Year(lower curve)
5m 6m 10m 20m 30m 1hr 2hr 3hr 6hr 12hr 24hr 48hr 72hr
DURATION IN HOURS OR MINUTES

Appendix B : Aboriginal Cultural Heritage Inquiry System (ACHIS) Database Search Reports for M15/87 and L15/414

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Lodged

Search Criteria

No Aboriginal Cultural Heritage (ACH) Lodged in Mining Tenement - m 15/87

Disclaimer

Aboriginal heritage holds significant value to Aboriginal people for their social, spiritual, historical, scientific, or aesthetic importance within Aboriginal traditions, and provides an essential link for Aboriginal people to their past, present and future. In Western Australia Aboriginal heritage is protected under the *Aboriginal Heritage Act 1972*.

All Aboriginal cultural heritage in Western Australia is protected, whether or not the ACH has been reported or exists on the Register.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you provide the details to the Department via https://achknowledge.dplh.wa.gov.au/ach-enquiry-form and we will make every effort to rectify it as soon as possible.

Copyright

Coordinates

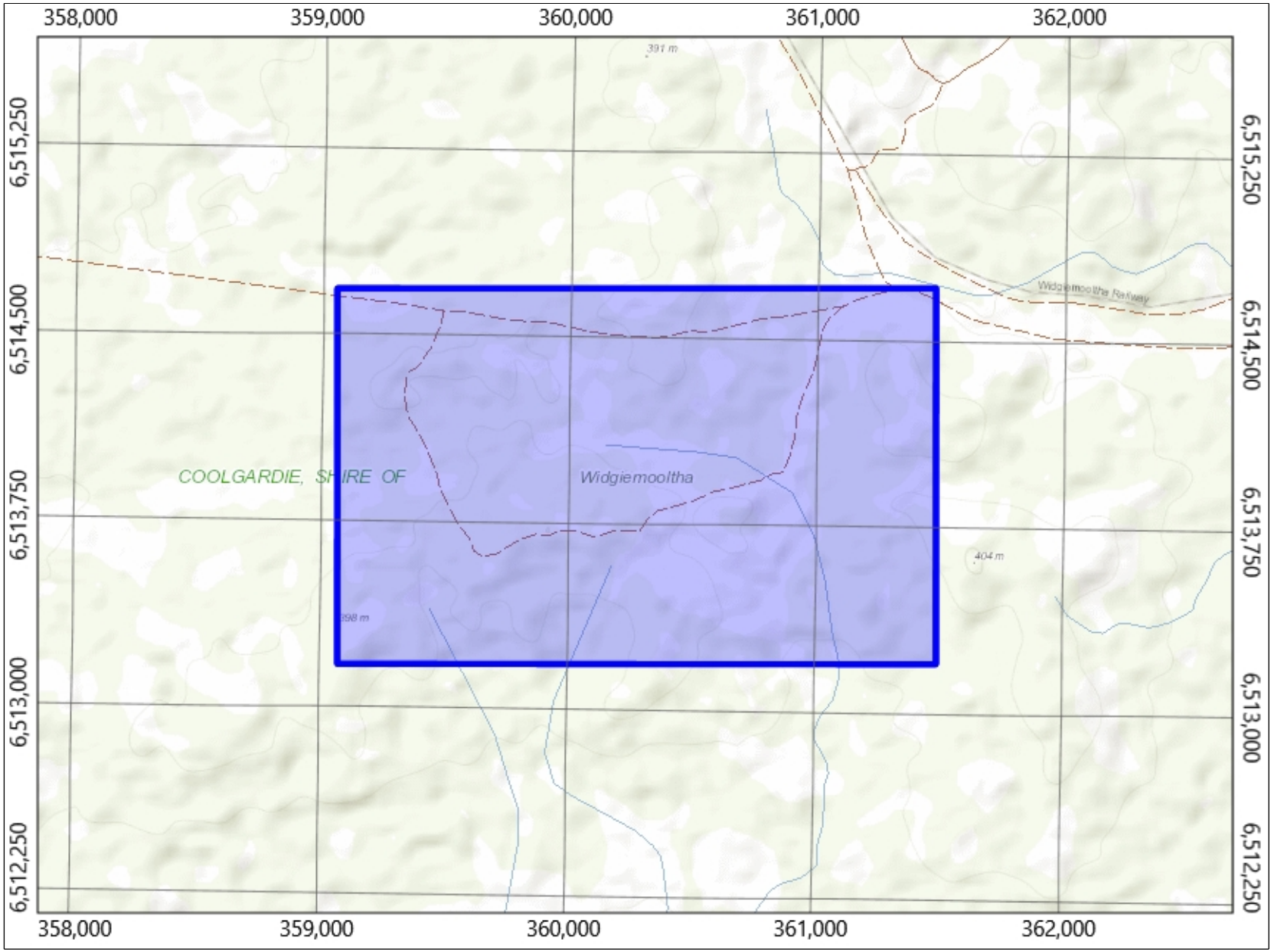
Map coordinates are based on the GDA 2020 Datum.

Basemap Copyright

Department of Planning, Lands and Heritage

Aboriginal Cultural Heritage Inquiry System

Map of Aboriginal Cultural Heritage (ACH) Lodged



Legend

- Aboriginal Cultural Heritage (ACH) Lodged
- Search Area
- Aboriginal Community
  - *Permanent*
  - *Seasonal*
  - *Town Based*
- Town
- Road
- River
- Local Government Authority

0.90 kilometres

Map Scale 1 : 27,400

MGA Zone 51 (GDA2020)

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Register

Search Criteria

No Aboriginal Cultural Heritage (ACH) Register in Mining Tenement - m 15/87

Disclaimer

Aboriginal heritage holds significant value to Aboriginal people for their social, spiritual, historical, scientific, or aesthetic importance within Aboriginal traditions, and provides an essential link for Aboriginal people to their past, present and future. In Western Australia Aboriginal heritage is protected under the Aboriginal Heritage Act 1972.

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Copyright

Coordinates

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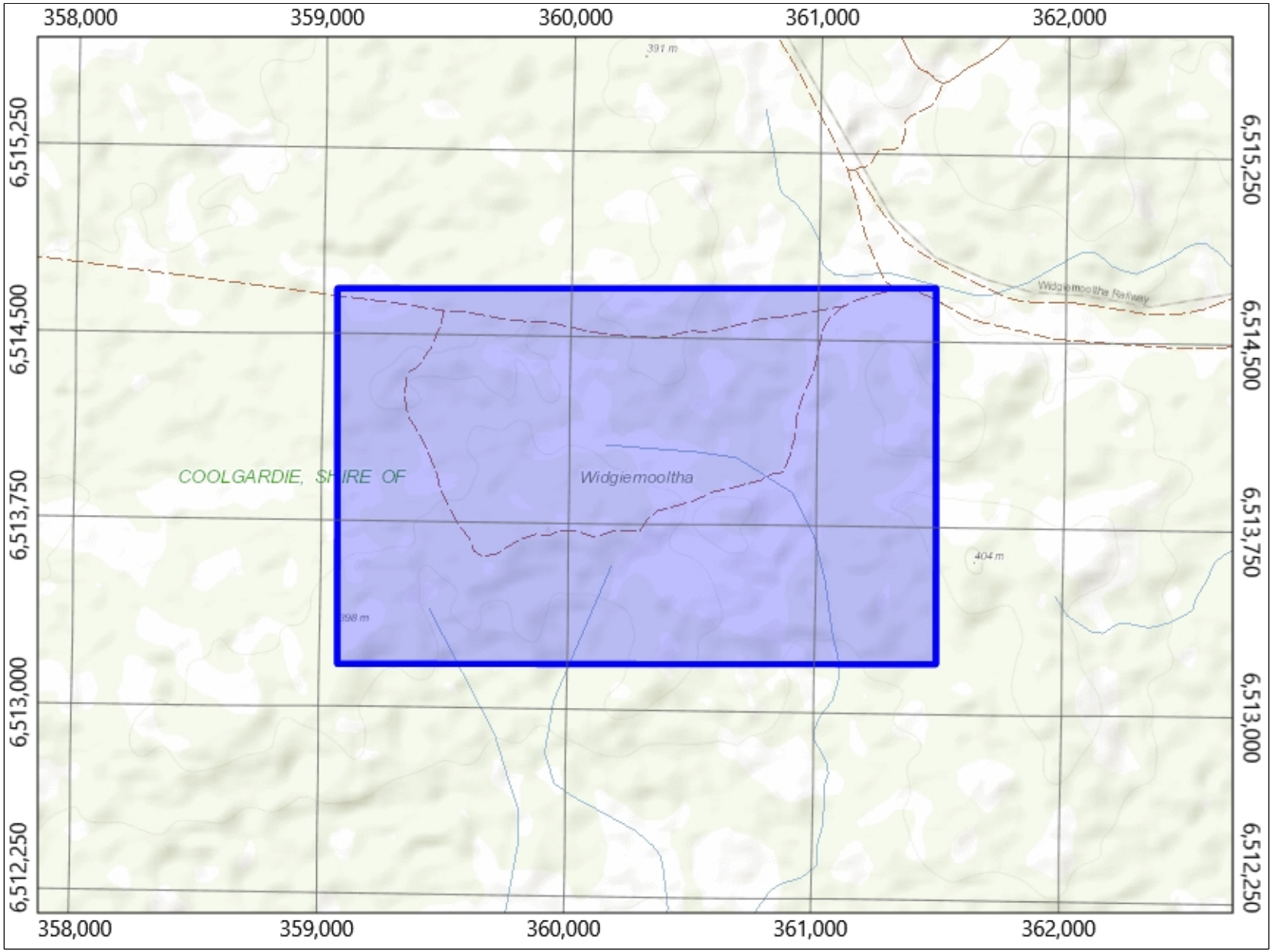
Department of Planning, Lands and Heritage

Aboriginal Cultural Heritage Inquiry System

Map of Aboriginal Cultural Heritage (ACH) Register



Legend

- Aboriginal Cultural Heritage (ACH) Register
- Search Area
- Aboriginal Community
  - *Permanent*
  - *Seasonal*
  - *Town Based*
- Town
- Road
- River
- Local Government Authority

0.90 kilometres

Map Scale 1 : 27,400

MGA Zone 51 (GDA2020)

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Lodged

Search Criteria

No Aboriginal Cultural Heritage (ACH) Lodged in Mining Tenement - L 15/414

Disclaimer

Aboriginal heritage holds significant value to Aboriginal people for their social, spiritual, historical, scientific, or aesthetic importance within Aboriginal traditions, and provides an essential link for Aboriginal people to their past, present and future. In Western Australia Aboriginal heritage is protected under the Aboriginal Heritage Act 1972.

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Copyright

Coordinates

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Basemap Copyright

Department of Planning, Lands and Heritage

Aboriginal Cultural Heritage Inquiry System

Map of Aboriginal Cultural Heritage (ACH) Lodged

Legend

- Aboriginal Cultural Heritage (ACH) Lodged
- Search Area
- Aboriginal Community
  - *Permanent*
  - *Seasonal*
  - *Town Based*
- Town
- Road
- River
- Local Government Authority

1.65 kilometres

Map Scale 1 : 50,000

MGA Zone 51 (GDA2020)

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Register

Search Criteria

No Aboriginal Cultural Heritage (ACH) Register in Mining Tenement - L 15/414

Disclaimer

Aboriginal heritage holds significant value to Aboriginal people for their social, spiritual, historical, scientific, or aesthetic importance within Aboriginal traditions, and provides an essential link for Aboriginal people to their past, present and future. In Western Australia Aboriginal heritage is protected under the Aboriginal Heritage Act 1972.

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Copyright

Coordinates

Map coordinates are based on the GDA 2020 Datum.

Basemap Copyright

Department of Planning, Lands and Heritage

Aboriginal Cultural Heritage Inquiry System

Map of Aboriginal Cultural Heritage (ACH) Register

Legend

- Aboriginal Cultural Heritage (ACH) Register
- Search Area
- Aboriginal Community
  - *Permanent*
  - *Seasonal*
  - *Town Based*
- Town
- Road
- River
- Local Government Authority

1.65 kilometres

Map Scale 1 : 50,000

MGA Zone 51 (GDA2020)

Appendix C : Clearing Permit Application

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Water and Environmental Regulation**

Department of **Energy, Mines, Industry Regulation and Safety**

Application for new permit or referral to clear native vegetation

This is the form to submit a referral of proposed clearing or apply for a clearing permit under Part V of the *Environmental Protection Act 1986* (EP Act).

Before you submit this form, please check you have completed all the fields for the form type and fully prepared any required supporting documents (maps etc.). The Department of Water and Environmental Regulation (DWER) or Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) will return/decline any forms that are not correctly completed.

To find out more about the stages of assessment for clearing permit forms, see the *Procedure: Native vegetation clearing permits*.

Part 1 – Form type

Select your form type. **Note**: Where appropriate in this form, and unless stated otherwise, the terms 'application' and 'applicant' also mean 'referral' and 'referrer' respectively.	☐ Referral of proposed clearing (section 51DA of the EP Act) ☐ Application for an area permit (section 51E of the EP Act) ☒ Application for a purpose permit (section 51E of the EP Act)

Which department are you submitting this form to? If the clearing is for mineral and petroleum activities authorised under the *Mining Act 1978*, the various petroleum Acts, and/or a State Agreement with areas covered by either mineral or petroleum tenure granted under one of the abovementioned Acts, select 'Department of Energy, Mines, Industry Regulation and Safety'. For all other clearing activities, select 'Department of Water and Environmental Regulation'.	☒ Department of Energy, Mines, Industry Regulation and Safety ☐ Department of Water and Environmental Regulation

Part 2 – Applicant details

2.1 Applicant name

For area permits:

If granted, the name(s) of (all) landowner(s) will be listed as 'permit holders' on the permit.

For purpose permits:

If granted, the name(s) of (all) applicant(s) will go on the permit.

☐ Applying as an individual – complete the following:

Title	☐ Mr ☐ Mrs ☐ Ms ☐ Other:	
Name(s)		

☒ Applying as a body corporate or other entity formed at law – complete the following:

Name	Widgie Gold Pty Ltd
Australian Company Number (ACN)	638864187

☐ Applying as a government entity (e.g. government department, local government authority, or other statutory body)

Name	

2.2 Applicant contact details

Provide the contact details for the above (primary contact).

Title	☒ Mr ☐ Mrs ☐ Ms ☐ Other:		
First name	John		
Last name	Utley		
Position	Technical Director		
Company name	Auric Mining Limited		
Phone number	0409109687	Mobile	0409109687
Email address	jutley@auricmining.com.au		

2.3 Applicant contact postal details

Provide the postal address for the above individual, body corporate or local government authority (primary contact).

Address line 1	PO Box 1057
Address line 2	

Suburb	Joondalup DC		
State	Western Australia	Postcode	6919

2.4 Applicant contact – registered business address

If applying as a company, incorporated body, local government authority or public authority, please also supply the registered business office address.

Address line 1	Level 1		
Address line 2	1 Tully Road		
Suburb	East Perth		
State	Western Australia	Postcode	6004
Phone number	0409109687	Mobile	0409109687

2.5 Electronic correspondence consent

DWER/DEMIRS prefer to send all correspondence via email. We request that you consent to receiving all correspondence relating to instruments and notices under Part V of the EP Act via email. Please indicate your consent in this section of the form.

I consent that all written correspondence between myself (the applicant) and DWER/DEMIRS (as applicable) about the subject of this form will be exclusively via email, using the email address provided above.	☒ Yes ☐ No

2.6 Contact details for enquiries

If different from the applicant's contact details, enter the contact details of a person with whom DWER/DEMIRS should liaise with (e.g. a consultant).

Same as applicant's contact details	☒ Yes ☐ No

If 'No' – complete the following:

Title	☐ Mr ☐ Mrs ☐ Ms ☐ Other:		
Contact name			
Position (if applicable)			
Company name (if applicable)			
Phone number		Mobile	

Email address			
Business or postal address line 1			
Business or postal address line 2			
Suburb			
State		Postcode	

Part 3 – Land details

- You must accurately describe the location of the land where your clearing is proposed.
- Provide copies of associated documents registered against the Certificate of Title (limitations, interests, encumbrances or notifications) where the clearing may impact them (i.e. caveats within freehold Lots).
- If you have a large number of properties, please provide the relevant details for each property in a separately attached supporting document.

I have a large number of properties and have given the relevant details in an attached supporting document.	☐ Yes – skip to Part 4 ☐ No

If 'No' – complete the following:

Land description Provide the following details, as applicable, for all properties: – volume and folio number – lot or location number(s) – crown lease or reserve number – pastoral lease number – mining tenement number	M15/87 L15/414		
Street address – Line 1	Coolgardie Esperance Hwy		
Street address – Line 2			
Suburb	Widgiemooltha		
State	Western Australia	Postcode	6443
Local government area(s)	Shire of Coolgardie		
Land zoning	Rural		

Part 4 – Relationship to landowner

Tell us which of the following options best describes you as the person completing and submitting this form. If you are filling out this form on behalf of the applicant, answer this question as though you are the applicant.

Proof of ownership may include:

- a certificate of title
- a pastoral or mining lease
- public authority that has care, control or management of the land
- other form of lease, land tenure or specific arrangement.

Relationship to landowner **(select one of the following options)**	**Complete the following**
☒ I am the landowner	☒ Attach proof of ownership
☐ I am lodging a form on behalf of the landowner (e.g. a consultant)	☐ Attach proof of ownership
☐ I am acting on the landowner's behalf and will be jointly responsible for the clearing permit (i.e. joint form)	☐ Attach proof of ownership ☐ Attach a letter, in which the landowner authorises you to act on their behalf and acknowledge they will be jointly responsible for the clearing permit
☐ I am likely to become the landowner	☐ Attach evidence of the pending transfer of ownership, including details of current proprietor on certificate of title, and/or contract of sale ('offer and acceptance')
☐ I will undertake the clearing activities with the landowner's authority and will be the permit holder	☐ Attach proof of ownership ☐ Attach a letter, in which the landowner authorises you to access and clear native vegetation within the property(ies) as detailed in section 3.1 (if the applicant is not the landowner)
☐ I am a person with multiple land parcels within which clearing is proposed	☐ Attach proof of ownership and/or ☐ Attach letters, in which the landowner authorises you to access and clear native vegetation within the properties as detailed in section 3.1 (if the applicant is not the landowner)
☐ I will undertake the clearing activities through the exercise of power conferred by different legislation (e.g. the *Energy Operators (Powers) Act 1979*)	☐ Provide relevant legislative details:

Part 5 – Proposed clearing

5.1 Maps and/or spatial data

Select which map type(s) you will attach with your form. Note: DWER/DEMIRS will decline/return forms (as applicable) if you do not provide sufficient information for this question.	☒ An ESRI shapefile with the following properties (preferred) • Geometry type: polygon shape • Coordinate system: Geocentric Datum of Australia (GDA) 2020 (geographic latitude/longitude) • Datum: GDA 2020 ☒ An aerial photograph or map with a north arrow, clearly marking the proposed clearing area Note: • An ESRI shapefile must use one of the following filename extensions: .shp, .shx, .dbf, and/or .prj • You must provide an ESRI shapefile if the form requires an assessment under an *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) accredited process. See Part 8 of this form for more information.

5.2 Size

- If you propose to clear a patch(es) of vegetation, enter a hectare value for the total size of the area (mark number of trees as zero). For example, "clearing of 5 hectares".
- If you propose to clear only individual trees (i.e. the shrubs, grasses, groundcover plants will remain intact), provide the number of trees. For example, "clearing of 10 trees". If any shrubs, grasses, and/or groundcover plants **may** be damaged in the clearing process, enter the total area only.
- If you propose to clear an area of native vegetation within a larger footprint, enter the hectare value for the total size of the area to be cleared (mark number of trees as zero) and the size of the footprint. For example, 5 hectares of clearing within a 10-hectare footprint. This option is only available for purpose permit applications.
- Enter values for **both** number of trees and the size of the area **only if** you are clearing individual trees in one area **and** a patch of vegetation in a different area.
- Please note the following area conversions/calculations:

1 hectare = 10,000 m^2	Area of circle = 3.14 x $radius^2$
1 acre = 0.4 hectares/4,000 m^2	Area of a rectangle = length x width
1 tree = 0.01 hectares/100 m^2	Area of a triangle = ½ length x perpendicular height

Total area of clearing proposed (hectares)	**135**
Footprint of clearing (hectares) (purpose permit only)	**280**
Number of individual trees to be cleared	**0**

Note: Calculate the area of a tree based on the area encompassed by the tree's drip line; that being the outermost circumference of the tree's canopy.

5.3 Purpose

Provide the reason for proposed clearing (e.g. road construction, grazing and pasture, hazard reduction, horticulture, timber harvesting etc.). If applicable, provide any additional project overview or explain in detail the activities on the property (e.g. provide context of work proposed and describe how clearing will contribute to overall work activities onsite etc.).	To allow recommencement of open pit mining within the Munda Gold Project and construct a haul road that will connect the mine site to the existing Mt Edwards Haul Road for ore haulage to Coolgardie
Specify what the final land use will be after clearing	Mining followed by land under rehabilitation

5.4 Method

Proposed method of clearing (i.e. burning, cutting, draining, flooding, grazing, mechanical clearing/bulldozing or other – specify)	Mechanical Clearing

5.5 Timeframe

Period within which you propose to do the clearing (e.g. 1/7/2022 to 30/8/2024)	Start date: 1 January 2025 End date: 31 December 2029

Note: The clearing referral process is not suitable for any clearing that is expected to take longer than two years.

5.6 Pre-application scoping

Historic clearing of native vegetation in the Swan Coastal Plain and Avon Wheatbelt Interim Biogeographic Regionalisation for Australia (IBRA) bioregions has been extensive. DWER/DEMIRS strongly recommends a pre-application meeting if you propose to clear native vegetation within these bioregions.

Do you propose to clear native vegetation within the Swan Coastal Plain or Avon Wheatbelt bioregions?	☐ Yes – complete section below ☐ I have had a pre-application meeting with DWER/DEMIRS Insert date of meeting and officer name(s): [ ] ☐ I have contacted DWER/DEMIRS in relation to a pre-application meeting and been advised that a meeting is unnecessary in this case. Insert date of conversation and officer name(s): [ ]

	☐ I have not had a pre-application meeting with DWER/DEMIRS. I understand that this may increase the likelihood of requests for further information and/or delays in assessment. ☒ No – proceed to next question.

Part 6 – Mitigation hierarchy

6.1 Avoidance and mitigation

Explain how you have, or will, put avoidance and mitigation measures in place to eliminate, reduce, or otherwise mitigate the need for and scale of the proposed clearing of native vegetation.

Attach supporting documents to substantiate your explanation.

Your explanation should demonstrate you have planned the project so that the least clearing possible is to be undertaken. The following questions may help you frame your explanation:

- Why did you select this location and amount of clearing?
- What alternatives to clearing – e.g. engineering solutions – did you consider? (Attach design drawings where applicable)
- What changes, if any, did you make to the location or amount of clearing to reduce the impacts of the clearing?

Note: If you do not demonstrate adequate efforts to avoid and mitigate clearing, DWER/DEMIRS will ask you to do so during the validation of this application. Offsets will only be considered by DWER/DEMIRS as a last resort, once avoidance and minimisation measures have been clearly demonstrated.

Provide the avoidance details (e.g. retention of vegetation on property)	Munda is a historic minesite. Planned infrastructure will, where possible be located in historically cleared or degraded areas and linked to existing area infrastructure to minimize the need for new clearing. (i.e. use of Mt Edwards Haul Road). Progressive clearing undertaken as required to accommodate project development stages. Progressive rehabilitation will be part of the mine planning process.
Provide the mitigation details (e.g. management of weed spread, rehabilitation)	Weed control will be ongoing throughout the active mining period in accordance with Auric Mining Weed Management Procedure. Implement progressive rehabilitation of mining disturbed areas where feasible.

6.2 Offsets

Do you want to submit a clearing offset proposal with your form?	☐ Yes ☒ No
If 'Yes' – please complete and attach Appendix A of the *Clearing of native vegetation offsets procedure* guideline as a supporting document for your form.	☐ Appendix A attached

Part 7 – Surveys for assessments (IBSA and IMSA)

Do you want to submit marine or biodiversity surveys in support of your form?	☒ Yes ☐ No – skip to Part 8

7.1 Biodiversity surveys

If you want to submit any biodiversity surveys to support this form, you must follow the Environmental Protection Authority's (EPA) *Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessments* (IBSA). If you do not meet the IBSA requirements, DWER/DEMIRS will decline/return your form.

Please provide the IBSA number(s) – or submission number(s) if the IBSA number has not yet been issued – in the space provided. Note that a submission number is not confirmation that a biodiversity survey has been accepted and is not the same as an IBSA number. IBSA numbers are only issued once a survey has been accepted. Once an IBSA number is issued, please notify DWER/DEMIRS. Please note DWER/DEMIRS will suspend the assessment timeframes for your application until you provide the IBSA number(s).

Have you submitted all the biodiversity surveys that support this form to the Index of Biodiversity Surveys for Assessment?	☒ Yes ☐ Not applicable
Provide an IBSA number (preferred) or a submission number(s)	IBSA-2024-0437

7.2 Marine surveys

If you want to submit any marine surveys to support this form, you must follow the EPA's *Instructions for the preparation of data packages for the Index of Marine Surveys for Assessments* (IMSA). If you do not meet the IMSA requirements, DWER/DEMIRS will decline/return your form.

Have you prepared all the marine surveys that support this form in accordance with the EPA's *Instructions for the preparation of data packages for the Index of Marine Surveys for Assessments*?	☐ Yes ☒ Not applicable

Part 8 – Assessment bilateral agreement

The native vegetation clearing processes under Part V of the EP Act have been accredited by the Commonwealth of Australia under the EPBC Act and so can be assessed under an assessment bilateral agreement.

To be assessed this way, the proposed clearing action must have been referred to the Commonwealth under the EPBC Act and deemed a '**controlled action**' before you submit this form. DWER/DEMIRS will decline to deal with your application without the proposed clearing first being deemed a controlled action.

For further information, see DWER's guidance on the assessment bilateral agreement.

Do you want your proposed clearing action assessed in accordance with, or under, an EPBC Act Accredited Process, such as the assessment bilateral agreement or accredited assessment?	☐ Yes ☒ No – skip to Part 9
Is your proposed clearing a controlled action? If 'Yes', please make sure you have entered all the mandatory details in the Annex C7 form	☐ Yes EPBC number: ☐ Annex C7 form attached ☐ No (DWER/DEMIRS cannot assess the application under an EPBC Act Accredited Process)
List the controlling provisions identified in the notification of the controlled action decision	

Part 9 – Other approvals

9.1 Environmental impact assessment (Part IV of the EP Act)

Clearing may be referred to the EPA if it is considered to be part of a 'significant proposal', as defined by section 37B(1) of the EP Act, or will likely to be part of a larger development. An example is when the clearing is for a road to a future mine.

Section 37B(1) of the EP Act defines a 'significant proposal' as "a proposal likely, if implemented, to have a significant effect on the environment". If a decision-making authority (e.g. DWER/DEMIRS) considers the proposal in this form is likely to constitute a 'significant proposal', under section 38(5) of the EP Act they must refer the proposal to the EPA under Part IV, if such a referral has not already been made.

Has the proposed clearing or any related matter been referred to the EPA?	☐ Yes Enter details: ☒ No – complete question below.
If 'No' – do you intend to refer the proposal to the EPA?	☐ Yes – intend to refer (proposal is a 'significant proposal') ☐ Yes – intend to refer (proposal will require a section 45C amendment to the current Ministerial Statement) ☐ No – a current valid Ministerial Statement applies Enter Ministerial Statement number: ☒ No – not a significant proposal

9.2 Other approvals – works approval, licence or registration (Part V Division 3 of the EP Act)

Have you applied or do you intend to apply for a works approval, licence, registration or an amendment to any of the above, under Part V Division 3 of the EP Act? It is an offence to perform any action that would cause a premises to become a prescribed premises of a type listed in Schedule 1 of the Environmental Protection Regulations 1987, unless that action is done in accordance with a works approval, licence or registration. For further guidance, see DWER's *Procedure: Prescribed premises works approvals and licences* and *Guideline: Industry regulation guide to licensing*.	☐ Yes Application reference: ☐ No – a valid works approval applies ☐ No – a valid licence applies ☐ No – a valid registration applies ☒ No – not required

9.3 Water licences and permits (*Rights in Water and Irrigation Act 1914*)

Have you applied or do you intend to apply for: • a licence or amendment to a licence to take water (surface water or groundwater) • a licence or amendment to a licence to construct wells (including bores and soaks), or • a permit or amendment to a permit to interfere with the bed and banks of a watercourse? For further guidance on water licences and permits under the *Rights in Water and Irrigation Act 1914*, see DWER's *Procedure: Water licences and permits*.	☒ Yes 068087-GWL Application ☐ No – a current valid licence applies Licence number: ☐ Not applicable

9.4 Planning and other approvals

Has the proposal obtained all relevant planning approvals and/or have you applied for all relevant planning approvals (e.g. Development Approval, Extractive Industry Licence, etc.)?	☐ Yes Enter details: ☒ No – planning approval is not required Enter details: ☐ Not applicable

Part 10 – Prescribed fee

10.1 Referral or application?

There are no prescribed fees for referrals. Is this form a referral of proposed clearing or an application for a new permit?	☐ Referral – skip to Part 11 ☒ Application – continue and complete Part 10

10.2 Calculating the application fees

You must pay the prescribed fee at the time you submit the application form. DWER/DEMIRS will decline to deal with your application if you do not pay the prescribed fee.

Please calculate the prescribed fee using the online clearing permit fee calculator tool.

For further guidance, see DWER's online clearing fees frequently asked questions.

Calculated fee:	$4,000

10.3 Payment method

Fees are payable to:

- **DWER** for all clearing purposes other than mineral and petroleum activities

  or

- **DEMIRS** for mineral and petroleum clearing activities under the *Mining Act 1978*, various petroleum Acts, or State Agreements.

Please indicate how you would like to pay your application fee. Select one option only.

DWER will only accept fees paid via either:

- DWER's BPoint system
- secure EFT payment, or
- cheque/money order.

DMIRS will only accept fees paid via secure credit card payment at the DMIRS online payment and application lodgement portal.

Do not send cash in the mail.

☐ **(DWER)** Secure credit card payment through BPoint

See www.dwer.wa.gov.au/make-a-payment.

Receipt number	
Date of payment	

☐ **(DWER)** Secure EFT payment

See www.dwer.wa.gov.au/make-a-payment for payment details.

State the name of the intended permit holder clearly in the EFT payment subject.

Date of payment	

☐ **(DWER)** Cheque/money order

Please make cheques or money orders payable to the **Department of Water and Environmental Regulation**.

☒ **(DEMIRS)** Secure credit card payment online at the

	DMIRS online payment and application lodgement portal. **Please note:** All DEMIRS applications will be paid online and submitted simultaneously. Please save this application form, along with any supporting documents, and have them ready for the submission portal. Use the link above to pay for and submit your application. A receipt will be issued upon submission only. Please ensure this receipt is saved for your records.

For further information on fees, go to the clearing permit fees frequently asked questions page on DWER's website.

Part 11 – Form checklist

Please ensure you have included the following as part of your form. You may also attach additional information to support the assessment of your proposal; for example, reports on salinity, fauna or flora studies or other environmental reports for the site. You should submit these in electronic format on a suitable portable digital storage device.

Required

☒ Proof of land ownership (see attachment requirements in Part 4).

☒ An aerial photograph and/or map with a north arrow that clearly shows the areas of vegetation for proposed clearing or an ESRI shapefile (see Part 5).

☒ If this form is a permit application, payment of the prescribed fee (see Part 10).

☒ Signed the legal declaration on the application form confirming that the information provided is correct (see Part 13).

As required

☐ Copy of written authority to act on behalf of landowner (see Part 4).

☐ Evidence of the pending transfer of land ownership, such as the offer and acceptance, or written notice from the current landowner.

☐ If you want the form to be assessed under the assessment bilateral agreement, include all details the Annex C7 form asks for, such as 'Proposed clearing action and impact assessment details' and 'Consultation' information.

☐ If the form includes a proposal for clearing offsets, include Appendix A of the *Clearing of native vegetation - offsets procedure* guideline.

☒ If you want to submit any biodiversity surveys to support this form, the relevant IBSA number(s). Do not include the survey reports themselves.

Additional supporting information

☐ Photos of the area.

☒ Aboriginal cultural heritage surveys, if undertaken.

☐ Any other additional supporting information.

Part 12 – Request for exemption from publication

The information you submit as part of this form will be made publicly available. If you wish to submit commercially or otherwise sensitive or confidential information, please identify the information in this section, and include a written statement of the reasons why you request each item of information be kept confidential.

DWER/DEMIRS will take reasonable steps under Part 3 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (the Clearing Regulations) to protect confidential material and/or otherwise sensitive information (such as information of a kind listed under regulation 13 of the Clearing Regulations).

However, please note that DWER/DEMIRS cannot commit to redacting all personal information from all supporting documents. We advise you to remove all personal information, including signatures, from any supporting documents before you submit them to us. Please note that all the information you submit may become the subject of an application for release under the *Freedom of Information Act 1992* (WA) (FOI Act).

You must identify all information in this form or attached supporting documents that you propose to be exempt from public disclosure in the table below. You must then attach a separate redacted version of this form and its supporting documents. This is in addition to the unredacted version(s) you submit to DWER/DEMIRS (as applicable) for assessment. You must specify the grounds for claiming an exemption in accordance with Part 3 of the Clearing Regulations.

<table>
<tr><td>Is any information in this form or in any attached supporting documents confidential or commercially sensitive?</td><td>☐ Yes<table><tr><td>Specify what part of this form or relevant attachment</td><td></td></tr><tr><td>Specify grounds for claiming exemption from publication</td><td></td></tr></table>☒ No</td></tr>
<tr><td>Attach file(s) with the relevant confidential information redacted</td><td>☐ File name:
☐ File name:
☐ File name:</td></tr>
</table>

Part 13 – Declaration

General

I / We declare and acknowledge that:

- the information I / we have provided in this form is true and correct
- I / we have legal authority to sign on behalf of the applicant (where authorisation provided)
- I / we have been authorised to make this form by the owner of the land (as applicable)
- I / we have not altered the requirements and instructions set out in this form
- I / we have provided a valid email address in Part 2 for receipt of correspondence via email from DWER/DEMIRS in relation to this form
- successful delivery to my / our server constitutes receipt of correspondence and service of any statutory notices or instruments, and
- giving or causing to be given information that to my knowledge is false or misleading is an offence under section 112 of the EP Act and may incur a penalty of up to $50,000.

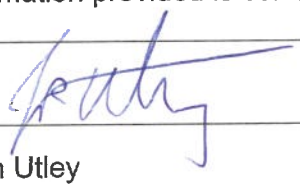
Publication

I / We declare and/or acknowledge that:

- this form (including all attachments) will be a public document and may be published, except for personal information including personal signatures, email and home addresses and any documents verifying my / our identity
- the marine surveys provided in accordance with Part 7 will be published and used for the purposes of the IMSA project, in accordance with your declaration made in the Metadata and Licensing Statement
- all necessary consents for the publication of information have been obtained from the relevant third parties
- the specification of the information identified in Part 12 constitutes a written request under regulation 11(2) of the Clearing Regulations not to publish that information due to its confidential or otherwise sensitive nature
- subsequent information provided to DWER/DEMIRS in relation to this form will be a public document and will be published under regulation 8A of the Clearing Regulations, unless accompanied by a further written request under regulation 11(2) by the referrer or applicant that that information be treated as confidential
- in accordance with the requirements of regulations 11, 12 and 13 of the Clearing Regulations, DWER/DEMIRS must refrain from publishing bank account details or confidential material (as defined under regulation 11(1) of the Clearing Regulations)
- DWER/DEMIRS may refrain from publishing:
    - certain otherwise sensitive information identified in Part 12, if satisfied it is desirable to not publish due to the confidential nature of the information
    - personal information or certain otherwise sensitive information listed under regulation 13 of the Clearing Regulations.

Are you signing as an individual or a company? Note 1: If an individual landowner is applying, all landowners as listed on Certificate of Title must sign this form. Note 2: If a company or other entity is applying, a person expressly authorised or authorised to execute on behalf of a body corporate must sign this form.	☐ An individual ☒ A company ☐ Other entity formed at law

☒ I / We hereby declare, the information provided is correct.

Signature			
Name	John Utley		
Date declaration signed	18/11/2024		
Position (if applicable)	Technical Director		
Company or organisation (if applicable)	Widgie Gold Pty Ltd	ACN:	638864187

Note that all persons who will be listed on any clearing permit granted for this application as holders of the permit must sign the application form. If more than one signature is required, attach all signatures together in a separate attachment.

Part 14 – Submission

14.1 Method of submission

Confirm how you will submit your form (mark one option only). **To submit to DWER:** Files larger than 50MB cannot be received via email. You can email DWER to make other arrangements for electronic transfer. **To submit to DEMIRS:** The DEMIRS online portal can accept 1024MB for each attachment. Files larger than 45MB cannot be received via email. You can email DEMIRS to make other arrangements for electronic transfer.	☐ A signed, electronic copy of the form, including all attachments, has been submitted via the applicable email address specified below **(if submitting form to DWER)**. ☐ A signed, electronic copy of the form has been submitted via the applicable email address specified below, and attachments have been submitted via File Transfer, or electronically by other means as arranged with the relevant department **(if submitting form to DWER)**. ☐ A full, signed hard copy has been sent to the applicable postal address specified below **(if submitting form to DWER)**. ☒ A signed electronic copy of the form, fee payment, and any supporting documentation has been saved and uploaded to the *DMIRS online payment and application lodgement portal* **(if submitting form to DEMIRS)**.

14.2 Submission details

- Please retain a copy of this form for your records.
- DWER/DEMIRS will decline or return incomplete forms that do not meet the requirements for a valid referral or permit application (as applicable).
- If you do not have enough space on any part of this form, please continue on a separate sheet of paper and attach it to this form.

Department of Water and Environmental Regulation	**Department of Energy, Mines, Industry Regulation and Safety**
Forms for all clearing purposes (other than mining and petroleum activities) may be submitted via: **Email:** info@dwer.wa.gov.au or **Post:** Department of Water and Environmental Regulation Locked Bag 10 Joondalup DC WA 6919 If you have any questions about lodging your form, please contact DWER via: **Email:** info@dwer.wa.gov.au **Phone:** (08) 6364 7000 For more information: www.dwer.wa.gov.au	Forms related to mining and petroleum clearing activities (under delegation) can be lodged online via the *DMIRS online payment and application lodgement portal*. If you have any questions about lodging your form, please contact DEMIRS via: **Email:** nvab@dmirs.wa.gov.au **Phone:** (08) 9222 3535 For more information: www.dmirs.wa.gov.au

Department of **Energy, Mines, Industry Regulation and Safety**

GOVERNMENT OF WESTERN AUSTRALIA

eMiTS MINERAL TITLES ONLINE

MINING TENEMENT SUMMARY REPORT

MISCELLANEOUS LICENCE 15/414

Status: Live

TENEMENT SUMMARY

Area: 41.61569 HA
Mark Out : N/A
Received : 03/11/2020 11:44:18
Term Granted : 21 Years
Death Reason :
Death Date :
Commence : 29/05/2023
Expiry : 28/05/2044

CURRENT HOLDER DETAILS

Name and Address
WIDGIE GOLD PTY LTD
TENEMENT MANAGER, C/- AUSTRALIAN MINING & EXPLORATION TITLE SERVICES PTY LTD, PO BOX 40, DUNCRAIG, WA, 6023, xx@amets.com.au, xxxxxxx739

DESCRIPTION

Locality: Mt Edwards
Datum: Datum peg is located @ 6517061.452mN 363883.712mE (GDA94 MGA Zone 51)
Boundary: Thence 6517006.779 mN 363896.175 mE Thence 6516884.917 mN 363662.781 mE Thence 6516369.202 mN 363364.061 mE Thence 6516087.000 mN 362586.000 mE Thence 6515888.905 mN 361940.989 mE Thence 6515677.000 mN 361755.000 mE Thence 6515536.316 mN 361542.317 mE Thence 6514483.100 mN 361035.544 mE Thence 6513805.227 mN 360919.300 mE Thence 6513803.762 mN 360809.690 mE Thence 6514559.935 mN 360971.869 mE Thence 6515536.000 mN 361460.000 mE Thence 6515738.000 mN 361705.000 mE Thence 6515965.538 mN 361861.651 mE Thence 6516175.000 mN 362540.000 mE Thence 6516427.000 mN 363261.000 mE Thence 6516576.000 mN 363395.000 mE Thence 6516948.216 mN 363611.039 mE BTD (All Coordinates are GDA94 MGA Zone 51)

Area :

Type	Dealing No	Start Date	Area
Granted		29/05/2023	41.61569 HA
Applied For		03/11/2020	42.00000 HA

SHIRE DETAILS

Shire	Shire No	Start	End	Area
COOLGARDIE SHIRE	1960	03/11/2020		41.61569 HA

RENT STATUS

Due For Year End 28/05/2025: PAID IN FULL
Due For Year End 28/05/2026: $1,108.80

EXPENDITURE STATUS

Expended Year End : NO EXPENDITURE REQUIRED
Current Year Commitment :

Department of **Energy, Mines, Industry Regulation and Safety**

GOVERNMENT OF WESTERN AUSTRALIA

eMiTS MINERAL TITLES ONLINE

MINING TENEMENT SUMMARY REPORT

MINING LEASE 15/87

Status: Live

TENEMENT SUMMARY

Area: 364.05000 HA
Mark Out : 22/11/1983 10:20:00
Received : 01/12/1983 12:05:00
Term Granted : 21 Years (Renewed)
Death Reason :
Death Date :
Commence : 06/08/1984
Expiry : 05/08/2026

CURRENT HOLDER DETAILS

Name and Address
WIDGIE GOLD PTY LTD
TENEMENT MANAGER, C/- AUSTRALIAN MINING & EXPLORATION TITLE SERVICES PTY LTD, PO BOX 40, DUNCRAIG, WA, 6023, xx@amets.com.au, xxxxxxx739

DESCRIPTION

Locality: WIDGIEMOOLTHA SOUTH
Datum: DATUM PEG SITUATED SOUTH WEST CORNER OF SURVEYED MC 15/139
Boundary: THENCE boundary identical to surveyed MC 15/139 15/140 and 15/141

Area :

Type	Dealing No	Start Date	Area
Surveyed		16/05/1989	364.05000 HA
Granted		06/08/1984	363.95000 HA
Applied For		22/11/1983	363.95000 HA

SHIRE DETAILS

Shire	Shire No	Start	End	Area
COOLGARDIE SHIRE	1960	22/11/1983		364.05000 HA

RENT STATUS

Due For Year End 05/08/2025: PAID IN FULL
Due For Year End 05/08/2026: $10,439.00

EXPENDITURE STATUS

Expended Year End 05/08/2024: EXPENDED IN FULL
Current Year Commitment : $36,500.00