Greenmount Resources

Karlawinda Gold Project

Application for a Native Vegetation Clearing Permit – Purpose Permit

May 2023

Contents

Figures

Tables

Appendix

1 Introduction

Greenmount Resources/Capricorn Metals Pty Ltd (Capricorn) requires a new Native Vegetation Clearing Permit (NVCP) (Purpose Permit) to replace the expired NVCP 7836/4 commissioned to 360 Environmental Pty Ltd as one of the approvals to continue and facilitate clearing in the Karlawinda Gold Project (the Project).

Mining activities have been undertaken on Mining Tenement M52/1070 under the approved Mining Proposal Reg ID 88886, located 60 km southeast of Newman in the Gascoyne region of Western Australia (WA) (**Figure 1**).

A new NVCP is required as the proposed clearing is more than 10 ha per annum per Mining Lease. The previous permit (NVCP 7836/4) allowed no clearing of more than 1,087 hectares of native vegetation. This new NVCP is applying for 500 ha of clearing within a 2,975 ha disturbance envelope (**Figure 2**). Clearing of native vegetation is required to support mining activities which include the continuation of Key Mine Activities (TSF, Waste Dumps) and Miscellaneous Mine Activities (Access Roads, Laydowns, Infrastructure, Topsoil stockpiles). **Figure 3** shows the proposed positioning the mining activities. Access to the Project and production borefield have been obtained via L52/177, L52/178, L52/179, L52/183, L52/189, L52/192, and L52/197 (**Figure 4**). These Miscellaneous Leases have been granted and approved under CPS 7836/4 (recently expired) and CPS 8464/2 (currently valid).

1.1 Background

The Department of Water and Environmental Regulation (DWER[1]), The Department of Mines and Industry Regulation (DMIRS[2]) and the Department of Biodiversity Conservation and

[1] At the time of consultation DWER was separately the Department of Water (DoW), The Department of Environment Regulation (DER), and the Office of the Environmental Protection Authority (OEPA)

[2] At the time of consultation DMIRS was the Department of Mines and Petroleum

Attractions (DBCA[3]) have been consulted as key regulators in the development of the Project. The Office of the Environmental Protection Authority (OEPA[4]) confirmed on 19 July 2016 that the Project may not require referral under s38 of the *Environmental Protection Act 1986* (EP Act) and could be permitted via a Mining Proposal and NVCP.

Consultation with DoW was undertaken as mining activity for the Project is approximately 7.5 km from the Savory Creek channel and the mining tenement covers a small proportion of the overall Savory Creek catchment. State and Federal guidance has indicated that mining is permissible within the catchment and the stream bed is the most sensitive area (highest priority for protection) followed by the foreshore and the wider catchment. Mining will only occur 7.5 km from the stream bed (**Figure 5**). DoW acknowledged that the overarching management objective for the Creek is to ensure that the hydrological and geomorphological function of the Savory Creek catchment is maintained.

360 Environmental Pty Ltd was commissioned by Capricorn in 2016 to undertake an NVCP application that was granted (#7836) with a duration from 27 January 2018 to 31 January 2023. The NVCP expired in January, therefore Capricorn requires a new NVCP to continue and facilitate clearing in the Project.

1.2 Proposal Tenures

The underlying tenure of the Project is pastoral, with M52/1070 wholly on Weelarrana station. The clearing outside of this tenement to facilitate the development of an access road and borefield has been granted on tenements L52/177, L52/178, L52/179 and L52/183. The status and ownership of the tenements are presented in **Table 1**. A native title claim occurs over M52/1070. The claim was lodged by the Nyiyaparli People. A Native Title Agreement (Land Access Agreement) has been issued between Capricorn Metals and the Nyiyaparli People.

[3] At the time of consultation DBCA was the Department of Parks and Wildlife (DPaW)

[4] Now Environmental Protection Authority Services, a part of DWER

1.3 Purpose of Document

The purpose of this document is to present the result of a desktop and survey study for the proposed new NVCP mainly in the tenement M52/1070 where the new clearing is planned. This NVCP application will be submitted to DMIRS as clearing is to be carried out on mining tenements.

Table 1: *Tenement Status*

TENEMENT	HOLDER	AREA (ha)	DATE OF GRANT	STATUS
M52/1070	Greenmount Resources Pty Ltd	2,975	23/11/2016	Live
L52/177	Greenmount Resources Pty Ltd	12.22	08/12/2017	Live
L52/178	Greenmount Resources Pty Ltd	21.41	08/12/2017	Live
L52/179	Greenmount Resources Pty Ltd	127.83	28/05/2018	Live
L52/183	Greenmount Resources Pty Ltd	28.46	02/05/2018	Live

1.4 Responsible Person

Capricorn Metals is responsible for the implementation of the clearing described within this document. Correspondence relating to this NVCP application should be addressed to:

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2 Assessment Methodology

2.1 Desktop Assessment

An initial desktop assessment included a review of current and relevant literature sources, databases and GIS Information (constraints mapping) to determine:

The possible impacts, environmental sensitivities and environmental risk associated with the proposed clearing; and whether the proposed clearing is exempt under the EP Act or the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Included in the desktop work was the assessment of the likely impacts to native vegetation clearing against the ten clearing principles applicable to the Permit, contained in the EP Act. The ten clearing principles are as follows:

Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity;

Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia;

Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of rare flora;

Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community (TEC);

Principle (e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared;

Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland;

Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation;

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;

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; and

Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

The desktop study provided background information on the flora and vegetation of the Project area. Database searches, as described in **Table 2**, of the Department of Biodiversity, Conservation and Attractions (DBCA) databases; Department of Climate Change Energy; the Environment and Water (DCCEEW); *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); Protected Matters Search Tool (PMST) were undertaken to compile a list of potential Threatened or Priority species and Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) that may occur in the Project area.

Table 2: *Database searches to identify potential environmental constraints*

POTENTIAL ENVIRONMENTAL CONSTRAINT(S)	DATABASE SEARCHES
Matters of National Environmental Significance (MNES)	EPBC Act PMST, 10 km radial search (DEE 2016; DCCEEW 2023).
Threatened and Priority species	DBCA Threatened and Priority Flora database, 50 km radial search (DPaW 2016a; 2023a) DBCA Threatened and Priority Fauna information, 50 km radial search (DPaW 2016a; 2023b)

	DBCA NatureMap and Dandjoo Fauna Search, 40 km radial search (DPaW 2016c; 2023c) Western Australian Museum (WAM). (2016). Arachnida and Myriapoda database search April 2016.
TECs and / or PECs	DBCA Threatened and Priority Ecological Community database, 80 km radial search (DPaW 2016; 2023d) EPBC Act PMST, 10 km radial search (DEE 2016; DCCEEW 2023).

2.2 Investigation Work

Table 3 outlines baseline surveys and for the Project which have been undertaken to date, survey extents are shown in **Figure 6**.

***Table 3**: Summary of Environmental Studies and Surveys*

CONSULTANT / SURVEY NAME	STUDY AREA, TYPE AND TIMING	STUDY STANDARD/ GUIDANCE AND LIMITATIONS	APPENDIX
360 Environmental (2016b) *Karlawinda Gold Project Flora and Vegetation Assessment*	Mining development envelope (3,173 ha) Desktop review and field survey March 2016	EPA Environmental Factor Guideline: Flora and Vegetation EPA Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment Consultation with DBCA Limitations: No significant limitations noted.	Appendix A

360 Environmental (2010) *Flora and Fauna Report*	Mining development envelope (3,173 ha) March 2010	EPA Environmental Factor Guideline: Flora and Vegetation EPA Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment EPA Environmental Factor Guideline Terrestrial Fauna EPA Technical Guidance: Sampling Methods for Terrestrial Vertebrate Fauna Limitations: No significant limitations noted.	Appendix B
360 Environmental (2016c) *Vertebrate Fauna Review* *EPBC Act Protected Matters Report*	Mining development envelope (3,173 ha) Desktop review April 2016	Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016	Appendix C
360 Environmental (2016d) *Desktop Risk Assessment for Subterranean Fauna and Short Range Endemics*	Mine footprint (600 ha) Desktop review July 2016	EPA Environmental Factor Guideline Terrestrial Fauna EPA Environmental Factor Guideline Subterranean Fauna	Appendix D
360 Environmental (2016e)	Mining development envelope (3,173 ha) October 2016	EPA Environmental Factor Guideline Terrestrial Fauna	Appendix E

Targeted Bilby and Mulgara Survey		EPA Technical Guidance: Sampling Methods for Terrestrial Vertebrate Fauna Consultation with DBCA Limitations: No significant limitations noted.	
360 Environmental (2017) Pilot Survey for Subterranean and SRE Fauna for the Karlawinda Gold Project, Western Australia – Phase 1 - 3.	Mining development envelope	EPA Environmental Factor Guideline Subterranean Fauna EPA Technical Guidance Subterranean Fauna Survey EPA Technical Guidance Sampling Methods for Subterranean Fauna Limitations: No significant limitations noted once all three phases were complete.	Appendix F

3 Environmental Management Measures and Rehabilitation

Environmental management measures that will be implemented to avoid, minimise and reduce the impacts of clearing include:

- Utilising existing access tracks where possible;
- Demarcate the clearing line;
- No clearing beyond disturbance boundary;
- Vehicles and equipment shall not be driven over, or parked on, vegetation and/or tree roots as far as practicable;
- Undertake staged clearing where possible;
- Locating support infrastructure on cleared land (e.g. stockpiles) where possible;
- Undertake progressive rehabilitation during life of mine; and
- Induct and educate personnel on environmental requirements of the Project.

Progressive rehabilitation of cleared areas will be undertaken during life of the mine. The Mine Closure Plan (approved by DMIRS) will detail all closure practices and management measures as required. Broad closure objectives include, but are not limited to:

- Engineering of safe and stable final waste dumps;
- Constructed waste dumps to be stable and consistent with local topography;
- Vegetation in rehabilitated areas will meet agreed criteria prior to relinquishment; and
- Rehabilitation of final landform to support self-sustaining, functional ecosystems comprising suitable, local flora species as far as available resources and site conditions allow.

4 Assessment against the Ten Clearing Principles

The proposed clearing activities have been assessed against the ten clearing principles regarding the DER (2014) Guide to Assessment: Clearing of Native Vegetation under the EP Act, and in consideration of the current extent and condition of the native vegetation on the site. This assessment is presented in the **Table 4**.

Table 4: *Assessment against the Ten Clearing Principles*

PRINCIPLE	ASSESSMENT
Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity	Flora: No threatened flora species pursuant to the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and/or gazetted as Declared Rare Flora pursuant to the WC Act were recorded during the 2010 and 2016 field surveys (360 Environmental 2016b and 2010) and desktop survey in 2023. Two 'Priority 3' species as listed by DBCA were recorded during the surveys, Eremophila rigida and Rhagodia sp. Hamersley (M Trudgen 17794). A total of five individuals of E. rigida and 16 individuals of Rhagodia sp were recorded in the mining area. The primary population of E. rigida recorded in the mining area is outside the indicative infrastructure footprint and can be avoided (Figure 7; 360 Environmental 2016b). None of the vegetation types recorded within the development envelope are considered to represent a State or Federal Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) in field survey (360 Environmental 2016b and 2010) and desktop survey in 2023 (Figure 8). Vegetation Condition ranges from Very Good to Good, with the majority of the survey area considered to be in Very Good condition Table 5 (Figure 9)

PRINCIPLE	ASSESSMENT

Table 5:Vegetation Condition and Extent in the Survey Area (Trudgen 1991)

condition	extent in survey area (360 environmental 2016b)	
	HA	%
Excellent	0	0
Very Good	2,941	93
Good	232	7
Poor	0	0
Cleared	0	0
Total	3,173	100

The 2016 Flora and Vegetation Survey recorded 185 taxa. Due to a lack of nearby surveys, it is difficult to compare the results of the Flora and Vegetation Survey with other relevant surveys (360 Environmental 2016b). However, three surveys within the general region of Newman have been undertaken and the results are as follows:

Confidential flora survey (360 Environmental 2017b) - 70 km west north west of Karlawinda

360 Environmental conducted a level 2 flora and vegetation assessment approximately 70 km north west of the Karlawinda project. The survey area was 1,375.87 ha (vs. 3,173 ha in the Karlawinda 2016 survey area) in which a total of 213 taxa from 101 genera and 34 families were recorded (vs. 185 taxa from 86 genera and 31 families at Karlawinda). The most frequently recorded genera were Acacia, Eremophila and Senna; no threatened flora, DRF nor Priority species were recorded during the survey; a total of ten introduced taxa were recorded – none of which were WONS; and a total of five vegetation types were identified in the survey area (360 Environmental 2017b). DBCA database searches (50 km radial search) revealed that within the surrounding areas of the survey area a number of Rhagodia sp. Hammersley (Trudgen

PRINCIPLE	ASSESSMENT
	17794) and Eremophila rigida Priority species have been recorded. The results from this survey indicate a wider variety of flora species within a smaller survey area and thus the Karlawinda project area does not particularly comprise higher levels of biological diversity than surrounding areas. Newman Powerline Corridor (Eco Logical 2011) – 60 km north west of Karlawinda A level 1 flora, vegetation and fauna survey was undertaken in 2011 by Eco Logical Australia (ELA) along a proposed powerline route in Newman, the survey area was 51.6 ha. A total of 33 dominant flora taxa were identified within the whole project area. The taxa comprised six families and 15 genera. Fourteen vegetation associations were identified along the Newman power line corridor alignment. No Threatened flora was identified in the project area. No Priority flora species were recorded and two weed species were recorded during the survey. Due to the small survey area, this Eco Logical report provides limited evidence with regard to the relative level of biodiversity. Newman Pipeline Corridor (Ecologia 2008) – 60 km north west of Karlawinda A level 1 flora and vegetation assessment was undertaken across a proposed water pipeline corridor surround the Newman Townsite. The survey consisted of sampling flora within 69 quadrats (50 m x 50 m) and 12 walked transects (approximately 17.25 ha in total). 375 taxa including 47 families, 137 genera and 353 confirmed species were recorded during the survey. No DRF were recorded and one Priority 3 species was recorded - Themeda sp. Hamersley Station. Fourteen environmental weeds were found during the Newman pipeline survey. One of the weed species is *Datura leichhardtii, which is a declared weed in most of Western Australia but not in the Pilbara Shires. No flora species or TECs of national significance were recorded. No TECs or DRFs of state significance were recorded in the Newman pipeline project area. The higher number of species in the Ecologia survey (despite the majority of the survey area being in only ‘Good’ condition) confirms that the Karlawinda project area does not represent a high level of biodiversity.

PRINCIPLE	ASSESSMENT
	There are no ESAs within or adjacent to the Karlawinda Project area. The nearest ESA is the Ethel Gorge Aquifer Stygobiont TEC located 43 km north west of the Project area (DER 2016). Fauna: 35 bird species, four reptiles and two native mammals were recorded in the 2010 survey. No frogs were recorded. Evidence of five species of introduced mammal was observed. Five bird species recorded in the survey (360 Environmental 2010) and six birds in the desktop survey 2023 are listed under State and/or Australian Government environmental legislation. Five broad fauna habitat types were identified in the 2010 and 2023 surveys of which none are identified as TECs, PECs of fauna habitats of conservation significance. Consequently, the habitat within the Project area is not considered to contain high levels of faunal diversity (360 Environmental 2010). Additionally, a review of the 2010 fauna survey was undertaken in 2016 and 2023 (Figure 10) in order to evaluate the changes in conservation status of fauna in the region, evaluate current guidance particularly for threatened species as well as undertake a risk based assessment for conservation significant species considered likely to occur in the project area (360 Environmental 2016c). The 2016 review confirmed (and consultation with Stephen Leeuwin of DPaW) that the project area did not provide suitable habitat for the majority of the conservation significant species (Pilbara Olive Python, Princess Parrot, Black-flanked Rock-wallaby, Northern Quoll, Ghost Bat, Peregrine Falcon, Grey Falcon [lack of nesting habitat], and Pilbara Leaf-nosed bat). The review found that the area could provide some suitable habitat for Great Desert Skinks; however, no records of the species were found within a 90 km radius DPaW database search of the project area. There was also a very limited number of records in the region for the Night Parrot, and thus considered unlikely to occur in the project area (360 Environmental 2016c). 360 Environmental conducted a targeted Bilby (Macrotis lagotis) and Mulgara (Brush-tailed Mulgara [Dasycercus blythi]) survey in September 2016 at the Karlawinda Project - after consultation with the DPaW had confirmed that a full vertebrate survey was not required, based on the species of conservation interest likely to be in the Survey Area and the amount of work already completed (360 Environmental 2016e). The Survey Area was 90 ha in size. No Bilbies, Mulgara or their signs (scats, tracks, scratchings or burrows) were recorded during the assessment. Hardpan was the most extensive broad

PRINCIPLE	ASSESSMENT
	habitat type (with this being based on substrate) in the Survey Area. Although not considered to be highly suitable habitat, it is considered to be suitable for Bilbies given that they would most likely be able to construct burrows and there are areas of suitable vegetation including hummock grassland and Acacia shrubland. However the Survey Area is on the edge of the Bilbies currently known distribution and there was only one record of the Bilby in the DPaW threatened fauna database and that was near Newman and undated (360 Environmental 2016e). Given this, the possibility of the Bilby occurring in the Survey Area is considered unlikely; the same is true for the Mulgara. Feral animals have been released into Savory Creek by a previous manager of Weelarrana Station for hunting purposes. Visits to the creek by Parks and Wildlife staff in the mid-late 90s during the Biological Survey of the South Western Little Sandy Desert noted some highly degraded areas along the creek, particularly in the vicinity of the abandoned Vermin Proof Fence (360 Environmental 2017a). Due to the limited fauna surveys undertaken in the vicinity of the Karlawinda project it is difficult to compare results. However, a level 1 fauna survey was undertaken in the surrounds of the Newman Townsite and the results are as follows: Newman Powerline Corridor (Eco Logical 2011) Five broad fauna habitat types were identified within the project area, with varying degrees of disturbance. One conservation significant species, the Rainbow Bee-eater (Merops ornatus), was recorded within the project area. No Priority species were recorded in the survey, however, the Blind Snake (Ramphotyphlops ganei), a (then) DEC listed Priority 1 species; and the Bush-stone Curlew (Burhinus grallarius), a (then) DEC listed Priority 4 species were most likely to occur in the area. A total of 52 native fauna species were recorded during the Level 1 fauna survey. Eight reptiles, 42 birds, and two mammals were identified within the project area. Additionally, four introduced species were recorded within the project area: dog (*Canis lupus familiaris), cat (*Felis catus), cattle (*Bos taurus), and the European rabbit (*Oryctolagus cuniculus). The results of this survey are similar to those recorded at Karlawinda, despite Karlawinda being

PRINCIPLE	ASSESSMENT
	a much larger survey area (5.6 ha vs. 8,860 ha, respectively). Given this, along with the limited diversity of fauna habitat and lack of relief, suggests that the clearing is unlikely to be at variance with this principle. Invertebrates: No recorded troglomorphic or stygofauna species or communities were recorded within the borefield or Bibra mine pit area. The results of the out of season preliminary SRE survey in 2016 were inconclusive due to the absence of rain combined with high temperatures immediately preceding the field survey, however, the SRE pilot survey undertaken in April 2017 had no constraints (Invertebrate Solutions 2017). Opportunistic sampling for SREs in March 2017 located seven large mygalomorph burrows with a single adult identified as Anidiops MYG286 which is a widespread species in the Pilbara. No other specimens recorded during the April 2017 survey are considered SRE species. Assessed Outcome: Results of surveys (and comparisons to other surveys in the area) have shown the Project area is unlikely to contain high levels of biodiversity. Consequently, the Project is unlikely to be at variance with Principle (a).
Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia	Five broad fauna habitat types were identified during the 2010 survey (360 Environmental 2010): **Habitat A:** Shrubs (e.g. *Eremophila* sp.) over spinifex; Includes vegetation communities Aa2AprTs and Aa2ChT **Habitat B:** Shrubs (e.g. *Eremophila* sp.) over gravelly ground of quartz with minimal spinifex Includes vegetation communities AaiAa2Ef and AaiApEf **Habitat C:** *Acacia* (Mulga) shrubland with minimal spinifex

PRINCIPLE	ASSESSMENT
	Includes vegetation communities Aa2AaiTep and AaiAa2 **Habitat D:** Rocky outcrop with occasional *Eremophila* sp. **Habitat E:** Patchy shrubs over patchy spinifex over gravelly ground Includes vegetation community AaaTsh **Vertebrates:** A likelihood of occurrence assessment determined that the following fauna species were possible or likely to occur in the Project area (360 Environmental 2016c): • Bilby (*Macrotis lagotis*) – Vulnerable (WC Act and EPBC Act); • Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) – Vulnerable (WC Act and EPBC Act); • Grey Falcon (*Falco hypoleucos*) – Vulnerable (WC Act); • Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Fauna (WC Act); and • Ghost Bat (*Macroderma giga*) – Vulnerable (WC Act and EPBC Act); and • Mulgara (Brush-tailed Mulgara [*Dasycercus blythi*]) – Priority 4 (360 Environmental 2016c). 35 bird species, four reptiles and two native mammals were recorded whilst no frogs were recorded during the 2010 survey (360 Environmental 2010). Of the species recorded, six bird species are listed under State and/or Australian Government environmental legislation including: • Pallid Cuckoo (*Cacomantis pallidus*) – Marine (EPBC Act); • Whistling Kite (*Haliastur sphenurus*) – Marine (EPBC Act); • Grey Falcon (*Falco hypoleucos*) – Vulnerable (WC Act);

PRINCIPLE	ASSESSMENT

- Australasian Pipit (*Anthus novaeseelandiae*) – Marine (EPBC Act).
- Black-faced Cuckoo-shrike (*Coracina novae-hollandiae*) – Marine (EPBC Act).
- Rainbow Bee-eater (*Merops ornatus*) – Migratory (WC Act) Marine (EPBC Act) (360 Environmental 2010).

A new desktop survey in 2023 (**Table 6**) found that the following fauna species were possible or likely to occur in the Project area:

Table 6: *Matters of National Environmental Significance (MNES) 10 km radial search from the project*

Listed Threatened Species				
Scientific Name	**Common Name**	**Class**	**WA listing**	**National listing**
Calidris ferruginea	Curlew Sandpiper	Bird	CR	CR & MI
Dasyurus hallucatus	Northern Quoll	Mammal	EN	EN
Pezoporus occidentalis	Night Parrot	Bird	CR	EN
Erythrotriorchis radiatus	Red Goshawk	Bird	VU	VU
Aphelocephala leucopsis	Southern Whiteface	Bird	VU	
Macrotis lagotis	Greater Bilby	Mammal	VU	VU
Falco hypoleucos	Grey Falcon	Bird	VU	
Macroderma gigas	Ghost Bat	Mammal	VU	VU
Liopholis kintorei	Great Desert Skink	Reptile	VU	VU

PRINCIPLE	ASSESSMENT

Polytelis alexandrae	Princess Parrot	Bird	Priority 4	VU
Listed Migratory Species				
Scientific Name	**Common Name**	**Class**	**WA listing**	**National listing**
Calidris melanotos	Pectoral Sandpiper	Bird	MI	MI
Motacilla cinerea	Grey Wagtail	Bird	MI	MI
Motacilla flava	Yellow Wagtail	Bird	MI	MI
Hirundo rustica	Barn Swallow	Bird	MI	MI
Apus pacificus	Fork-tailed Swift	Bird	MI	MI
Calidris ferruginea	Curlew Sandpiper	Bird	CR	CR & MI
Charadrius veredus	Oriental Plover	Bird	MI	MI
Actitis hypoleucos	Common Sandpiper	Bird	MI	MI
Calidris acuminata	Sharp-tailed	Bird	MI	MI

*CR: Critically endangered species, EN: Endangered species, VU: Vulnerable species, Priority 4: Rare, Near Threatened and other species in need of monitoring, MI: Migratory specie

The Grey Falcon frequents timbered lowland plains, particularly, Acacia shrublands that are crossed by tree-lined watercourses. It also hunts in treeless areas and frequents tussock grassland and open woodland, especially in winter (Garnett et al. 2011). Nesting has been recorded in River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*) trees up to 15 m above the ground (Johnstone & Storr 1998; Garnett et al. 2011).The recording of a Grey Falcon during

PRINCIPLE	ASSESSMENT
	the survey indicates that the Project areas does at least have suitable foraging habitat however, the Project area lacks large trees suitable for nesting. Therefore the species is likely to be an occasional visitor to the Project area. Due to the widespread distribution of the Pallid Cuckoo, Whistling Kite, Australasian Pipit, Black-faced Cuckoo-shrike and Rainbow Bee-eater and the extent of suitable habitat outside of the Project area, the impacts on these species from clearing associated with the Project is expected to be negligible (360 Environmental 2010). In the 2016 vertebrate fauna review outlined that listed marine bird species will have limited habitat within the project area since there is no permanent or natural water body present. Therefore the impacts to these species are not likely to be significant (360 Environmental 2016c). No Bilbies, Mulgara or their signs were recorded during the targeted Bilby and Mulgara survey assessment and subsequently possibility of the Bilby or Mulgara occurring in the Project area has been discounted (360 Environmental 2016e). The Project area contains limited suitable foraging habitat for the Ghost Bat and Pilbara Leaf-nosed Bat, and there are no nearby rocky hills where potential caves might occur (360 Environmental 2016c). The Ghost Bat and Pilbara Leaf-nosed Bat are not considered to be significantly impacted by the Project as the Project does not propose to disturb historic adits and the low-relief landscape is widespread. **Invertebrates:** The Project area contains potential habitat for subterranean fauna and SREs. Pilot surveys for subterranean and SRE fauna were undertaken by Invertebrate Solutions for Capricorn Metals NL on behalf of 360 Environmental. The first phase of the pilot survey was undertaken in November 2016 and a second round of stygofauna sampling and troglofauna trap retrieval were undertaken in March 2017. The SRE pilot survey was undertaken in April 2017, following the inconclusive out of season SRE survey undertaken in November 2016. Results of the surveys determined that:

PRINCIPLE	ASSESSMENT
	Opportunistic sampling for SREs in March 2017 located seven large mygalomorph burrows with a single adult identified as *Anidiops* MYG286 which is a widespread species in the Pilbara. No other specimens recorded during the April 2017 survey are considered SRE species; The troglofauna pilot survey recorded no troglomorphic species from the bore scraping of 10 bores within the pit area in November 2016. Nine troglofauna litter traps retrieved from the pit area in March 2017 also recorded no troglomorphic species. The results would therefore indicate that no troglofauna community is present within the pit area; No stygofauna were recorded from 11 bores within the Pit area during the pilot survey in November 2016 and hence there is expected to be no significant impacts to stygofauna from the development of the pit; and The stygofauna pilot survey undertaken within the Borefield area in March 2017 recorded no stygofauna species from six bores, and hence there is expected to be no significant stygofauna community present within the Borefield area (360 Environmental 2017). **Assessed Outcome:** Given the above, survey results suggest that habitat within the Project area is not necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia. The Project is unlikely to be at variance with Principle (b).
Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of rare flora.	Two Priority species as listed by DBCA were recorded during the surveys *Eremophila rigida* (Priority 3) and Rhagodia sp. Hamersley (M Trudgen 17794) (Priority 3). A total of five individuals of *E. rigida* and 16 individuals of *Rhagodia* sp Hamersley (M Trudgen 17794) were recorded in the mining area. The primary population of *E. rigida* recorded in the survey area is outside the clearing footprint (Figure 5). *Rhagodia* sp. Hamersley (M Trudgen 17794) (P3) was regularly recorded in low numbers in all the vegetation types across the Project area with the exception of vegetation type 2 (sandplains) where it was absent (360 Environmental 2016b).

PRINCIPLE	ASSESSMENT
	R. sp. Hamersley (M Trudgen 17794) is well known from the Pilbara bioregion where it has been recorded from all four subregions (WAH 2016). Records near the northern Gascoyne boundary appear to be the limit of its southern distribution (WAH 2016). Occurrences of this species within the Project area is likely to be part of a larger, widespread population and the clearing of up to 16 individuals is therefore not considered to cause a significant impact to the species. **Assessed Outcome:** The Project is unlikely to be at variance with Principle (c).
Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community (TEC).	A TEC database search revealed the closest TEC occurs 40 km from the Project area in the Pilbara, known as the 'Ethel Gorge Acquifer Stygobiotic Community' (Community 78) (DBCA 2016b). This site is known as one of the two most species rich sites in the world for subterranean amphipods occurring in WA, whereby the subterranean fauna occupy the calcretes at Ethel Gorge on the Fortescue River (Humphreys 2010). Impacts to the TEC are considered unlikely due to the separation distance between the clearing area and the TEC. None of the vegetation types recorded in the Project area are considered to represent a State or Federal Threatened Ecological Community in 360 Environmental 2016b and desktop survey 2023 (**Figure 11**). **Assessed Outcome:** The Project is unlikely to be at variance with Principle (d).
Principle (e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	Regional vegetation mapping indicates that vegetation within the Project area corresponds with: 29 – Sparse low woodland; Mulga, discontinuous in scattered groups; and 216 – Low woodland; Mulga (with Spinifex [*Triodia* spp.]) on rises (**Figure 12**; Shepherd et al. 2001). The current (2016) extent remaining of both vegetation types within the State and Gascoyne region is more than 99% (Government of Western Australia 2016). **Assessed Outcome:** The Project is unlikely to be at variance with Principle (e).

<table>
<tr><th>PRINCIPLE</th><th>ASSESSMENT</th></tr>
<tr><td>Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</td><td>The nearest watercourse occurring outside the clearing area is Savory Creek, located approximately eight kilometres from the mine pit. The mining tenement covers a small proportion of the overall Savory Creek catchment. Savory Creek is considered to be a major tributary of Lake Disappointment (Beard 2005) and is listed as a Wild River by the Commonwealth Department of the Environment and Energy (DEE).

Riparian vegetation will not be cleared under this NVCP.

Assessed Outcome: Clearing for the Project will not result in the clearing of riparian vegetation. The Project is unlikely to be at variance with Principle (f).</td></tr>
<tr><td>Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation</td><td>Land degradation may include the clearing of vegetation, decline in vegetation condition due to weeds and changes in natural fire regimes, and a decline in soil condition caused by wind and water erosion. Clearing of native vegetation has the potential to cause soil erosion. Table 7 outlines land systems occurring within the Project area and their susceptibility to erosion. The proportion of land systems occurring within the Project area is shown in Figure 13.

Table 7: Description of Land Systems Within the Project area (Van Vreeswyk et al. 2004)

<table>
<tr><th>Land system</th><th>Description</th><th>Susceptibility to erosion</th></tr>
<tr><td>Jamindie System</td><td>Stony hardpan plains and rises

supporting grooved mulga shrublands, occasionally with spinifex understorey</td><td>Some hardpan plains (unit 3) are slightly susceptible and other parts are inherently resistant</td></tr>
<tr><td>Cadgie System</td><td>Hardpan plains with thin sand cover and sandy banks supporting mulga shrublands with soft and hard spinifex</td><td>Nil susceptibility to erosion</td></tr>
</table>
</td></tr>
</table>

PRINCIPLE	ASSESSMENT
	Assessment of both the land systems within the Project area suggests that some parts of the Jamindie land system are slightly susceptible to erosion, while the remaining land systems have no susceptibility to erosion. For both the land systems, staged clearing will be undertaken to minimise any potential erosion. A total of four introduced taxa were recorded during the survey. None of the introduced taxa recorded are listed as Weeds of National Significance or Declared under the *Biosecurity and Agriculture Management Act 2007* (360 Environmental 2016b) and therefore are not likely to have significant impacts on native vegetation establishment. Weed hygiene measures will be implemented during operations, including vehicle/machinery inspections and wash-downs. **Assessed Outcome:** The Project is unlikely to be at variance with Principle (g).
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 Project area is not located within or adjacent to any conservation reserves. The closest DBCA managed conservation estate is Collier Range National Park, which is located approximately 85 km south west of the Project area (DPaW 2016). There are no ESAs within or adjacent to the Project area. The nearest ESA located 43 km northwest of the Project area and is associated with Ethel Gorge Aquifer Stygobiont TEC (DER 2016). **Assessed Outcome:** The Project is unlikely to be at variance with Principle (h).
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	The Project is located within the following *Rights in Water and Irrigation Act 1914* (RIWI Act) surface and groundwater areas: • Pilbara Surface Water Area; • East Murchison Groundwater Area; and • Meekatharra Groundwater Subarea (DoW 2015).

PRINCIPLE	ASSESSMENT
	The Project is not located in a Public Drinking Water Source Area (PDWSA). The nearest PDWSA is the Newman Water Reserve located approximately 55 km north west of the Project area. Given the distance separating the application area and the nearest water supply, clearing for the Project is not likely to impact on the water quality of the Newman Water Reserve. The groundwater within the Project area is considered fresh, with salinity ranging between 500 - 1,000 milligrams per litre of Total Dissolved Solids (TDS) (DoW 2010). Soil salinity in the Pilbara region is variable and is dependent on land unit location, however many deep clays tend to have weakly saline subsoils (Van Vreeswyk *et al*. 2004). If exposed through erosion, these subsoils may become scalded and sealed, with greatly reduced water infiltration rates and increased surface salinity. However none of the land systems occurring within the Project area are known to demonstrate these properties. Savory Creek is located approximately 8 km south of the Project area. The Project area experiences an average annual rainfall of approximately 330.1 millimetres (BoM 2016). The mean number of days where more than 1 mm of rain is received is not more than five days per month (BoM 2016) and annual evaporation is approximately 3,600 mm (BoM 2017). It is therefore unlikely that the clearing for the Project will impact upon the quality of surface water as any surface water within the application area will be short lived. **Assessed Outcome:** The Project is unlikely to be at variance with Principle (i).
Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to	The Project area experiences an average annual rainfall of approximately 330.1 millimetres (BoM 2016). The mean number of days where more than 1 mm of rain is received is not more than five days per month (BoM 2016) and annual evaporation is approximately 3,600 mm (BoM 2017).

PRINCIPLE	ASSESSMENT
cause, or exacerbate, the incidence of flooding	It is therefore unlikely that the clearing for the Project will impact upon the quality of surface water as any surface water within the application area will be short lived. **Assessed Outcome:** The Project is unlikely to be at variance with Principle (j).

5 Summary of Assessment and Conclusion

In summary and following various desktop and field surveys of the environmental values of the Project area, it is considered that the Project is unlikely to be at variance with any of the ten clearing Principles. The key impacts associated with vegetation clearing are as follows:

- Clearing of up to 500 ha of native vegetation; and
- Clearing of up to 16 individuals of Rhagodia sp. Hamersley (M Trudgen 17794).

Capricorn Metals will undertake the following actions to ensure that clearing of native vegetation is avoided, minimised and reduced:

- Utilise existing access tracks where possible;
- Priority Flora locations will be retained where possible and clearly marked on site;
- Vehicles and equipment shall not be driven over, or parked on, vegetation and/or tree roots as far as practicable;
- Undertake staged clearing where possible;
- Locate support infrastructure on cleared land (e.g. stockpiles) where possible;
- No clearing beyond disturbance boundary;
- Undertake progressive rehabilitation during life of mine; and
- Induct and educate personnel on environmental requirements of the Project.

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FIGURES

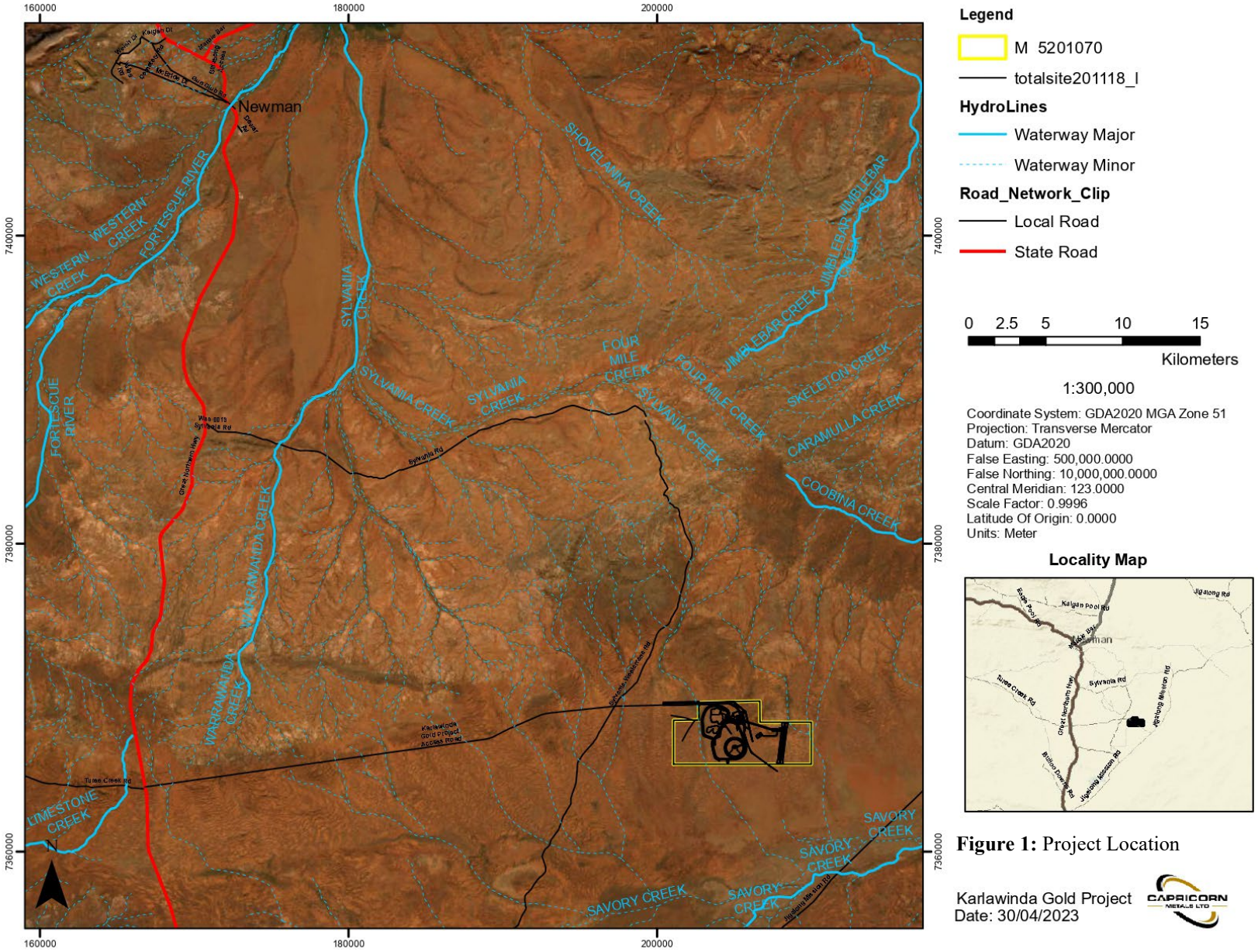

Figure 1: Project Location

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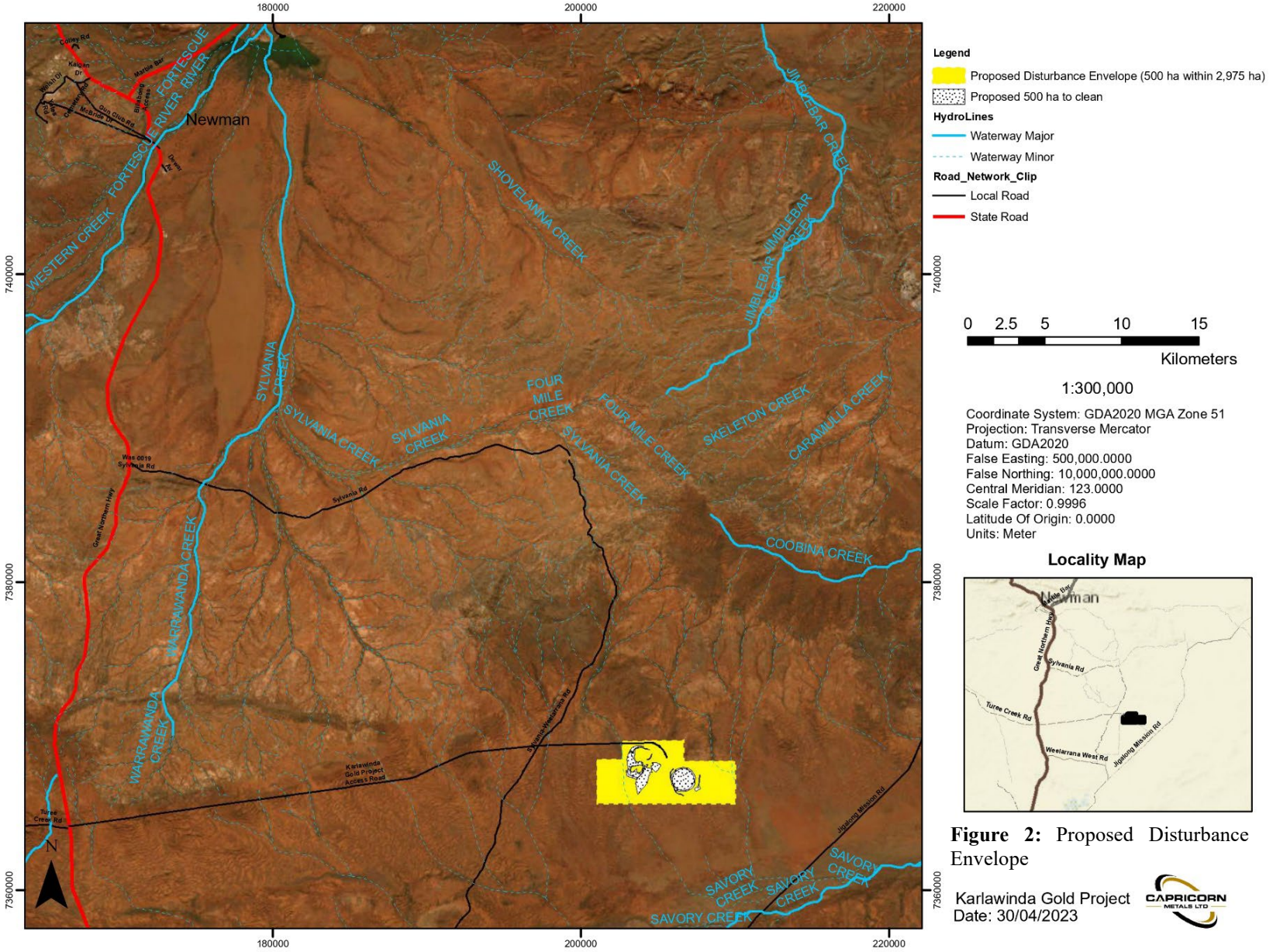

Figure 2: Proposed Disturbance Envelope

Karlawinda Gold Project
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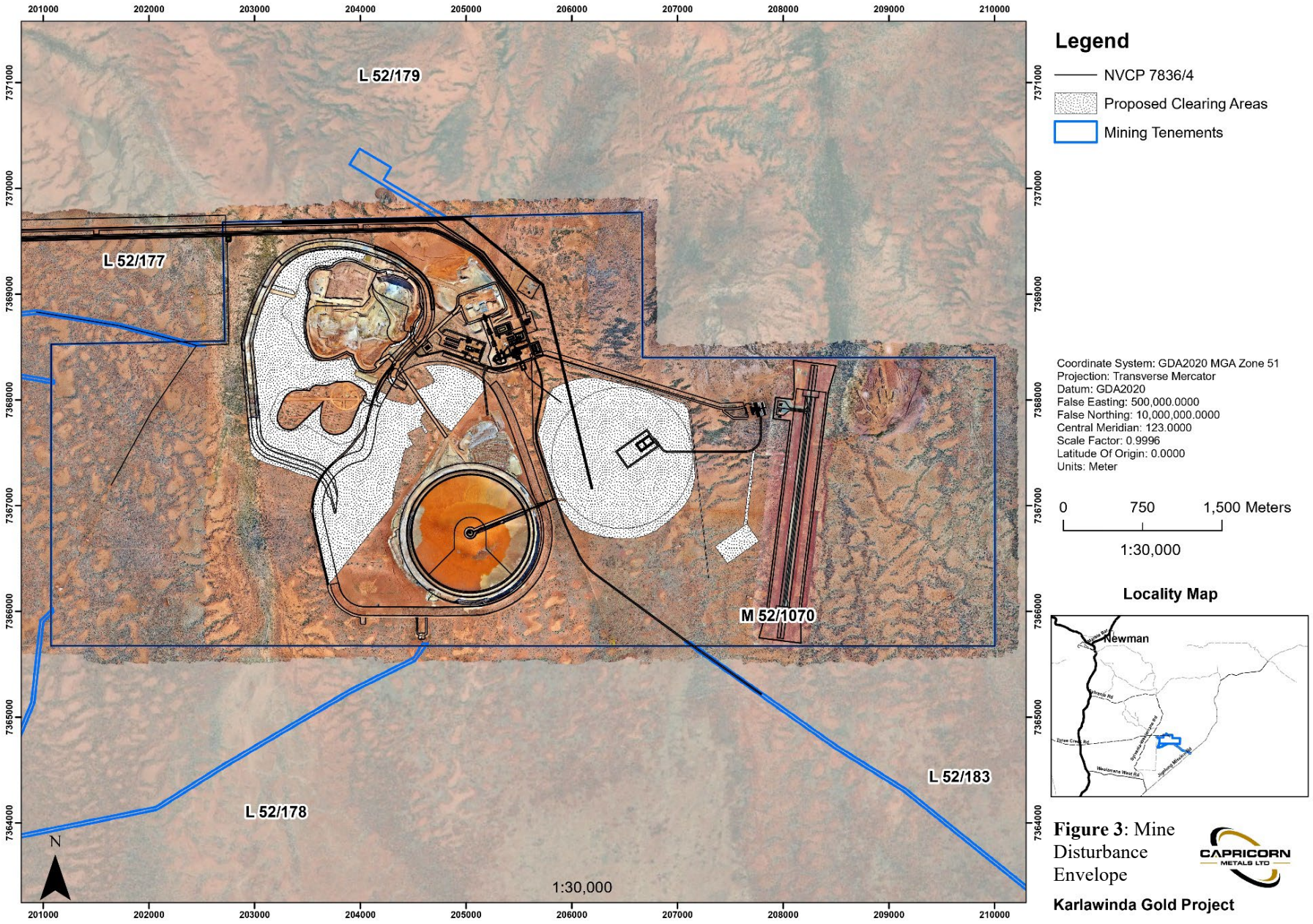
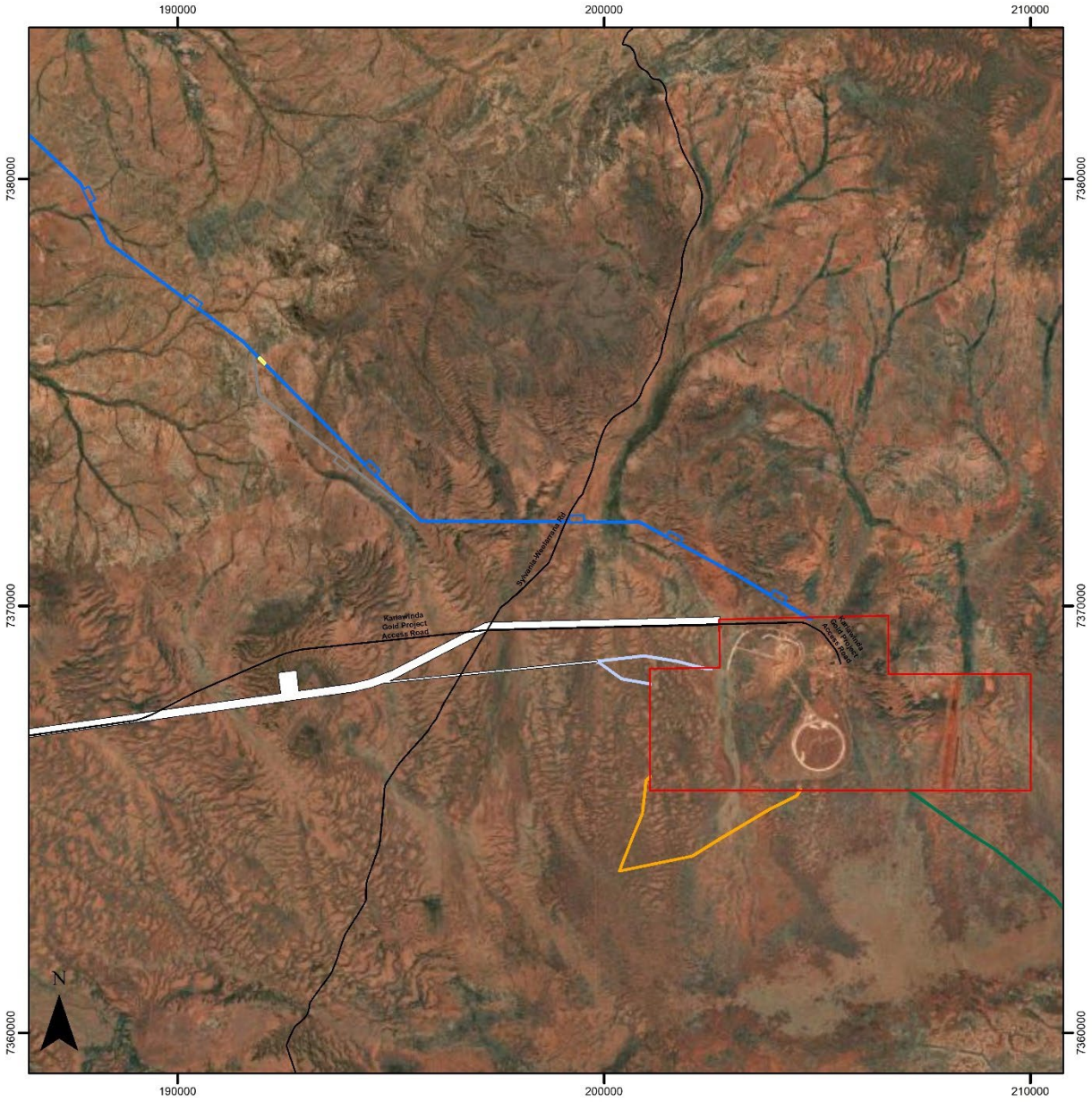


Figure 3: Mine Disturbance Envelope

Karlawinda Gold Project



Legend

- M 5201070
- L 5200174
- L 5200177
- L 5200178
- L 5200179
- L 5200181
- L 5200183
- L 5200189

Road Network

- Local Road
- State Road

0 1 2 4 6

Kilometers

1:125,000

Coordinate System: GDA2020 MGA Zone 51
Projection: Transverse Mercator
Datum: GDA2020
False Easting: 500,000.0000
False Northing: 10,000,000.0000
Central Meridian: 123.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Locality Map

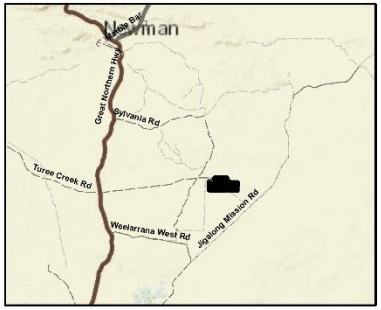


Figure 4: Access Roads, Powerline Corridor and Borefield Disturbance

Karlawinda Gold Project
Date: 30/04/2023

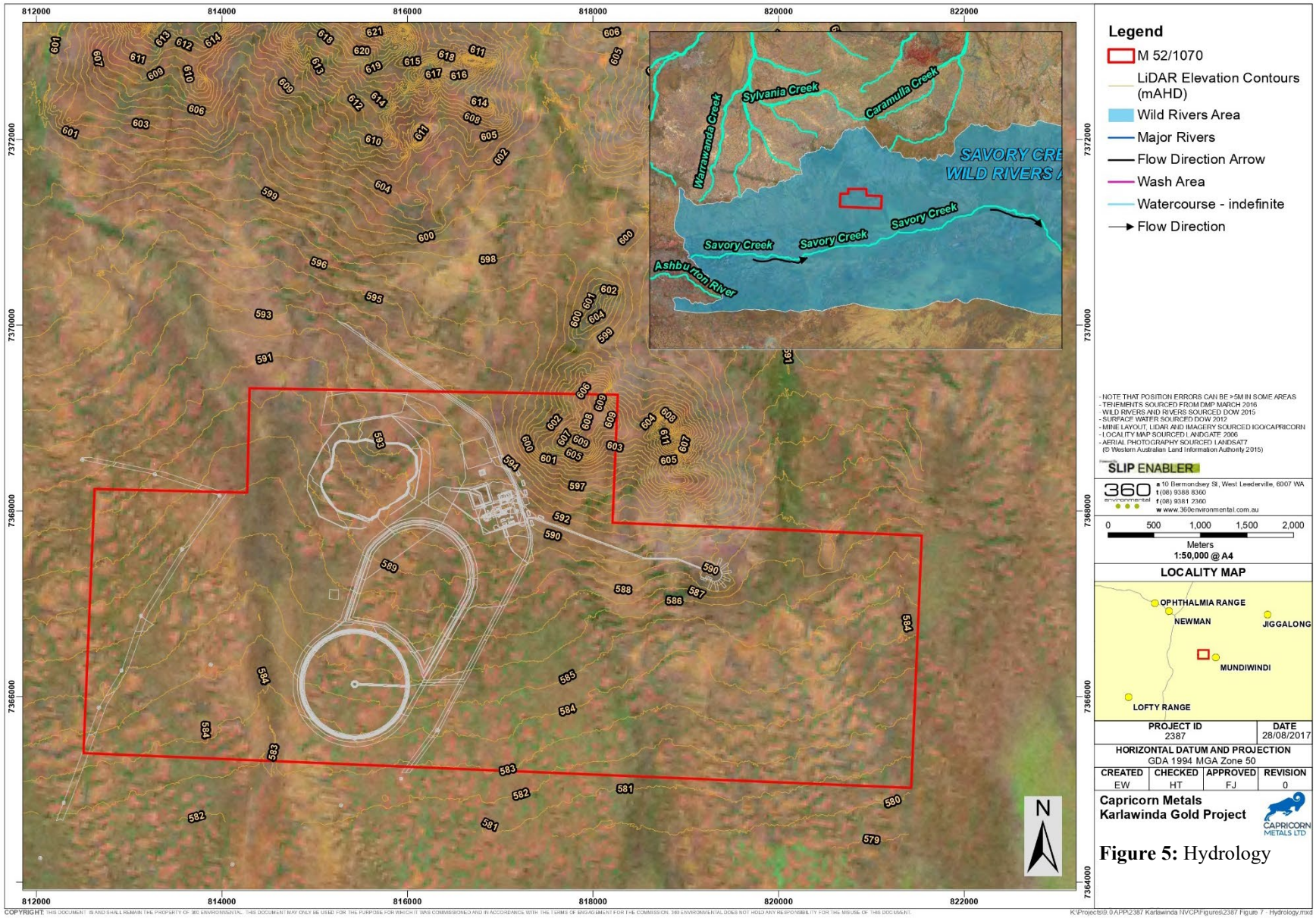


Figure 5: Hydrology

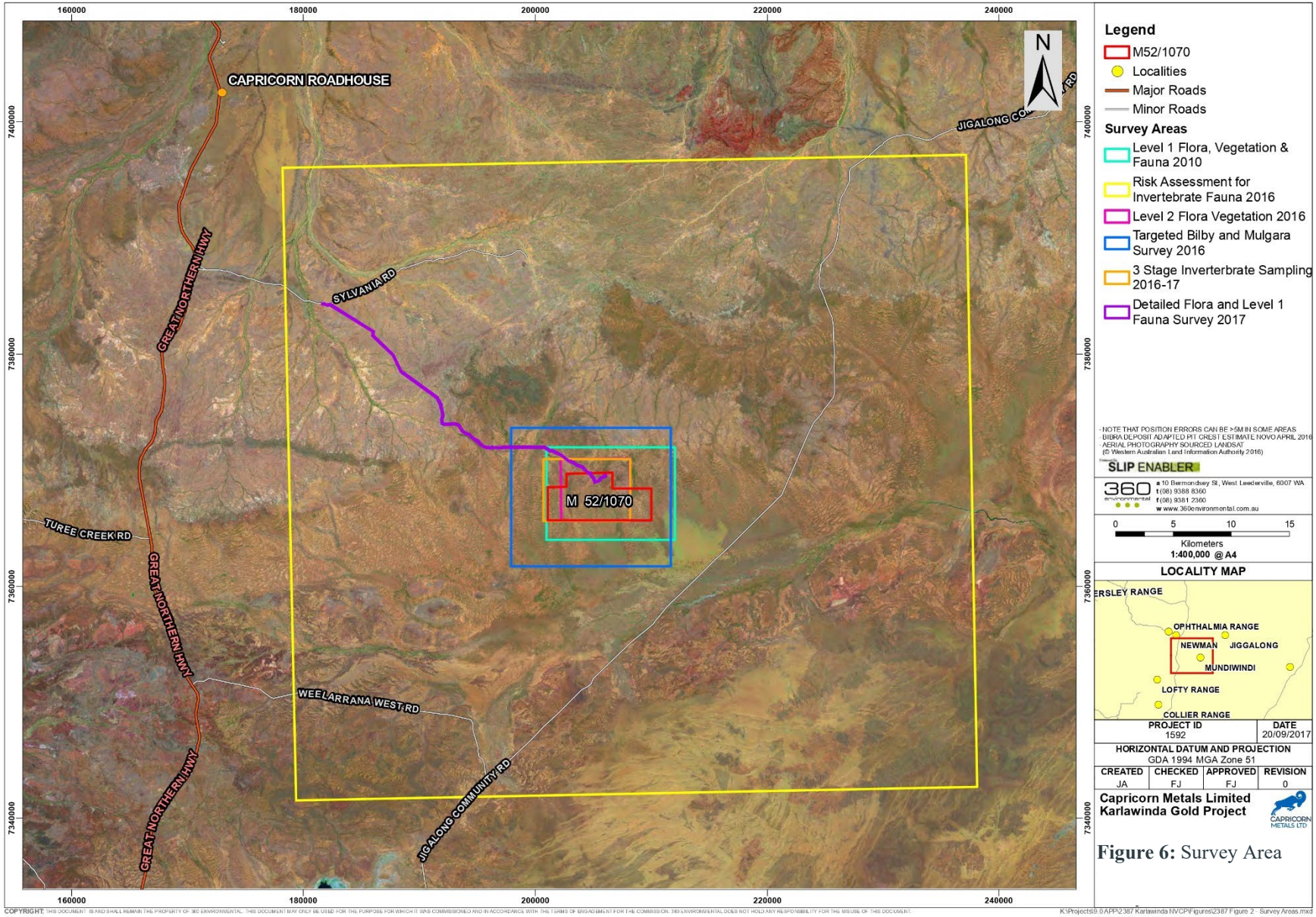


Figure 6: Survey Area

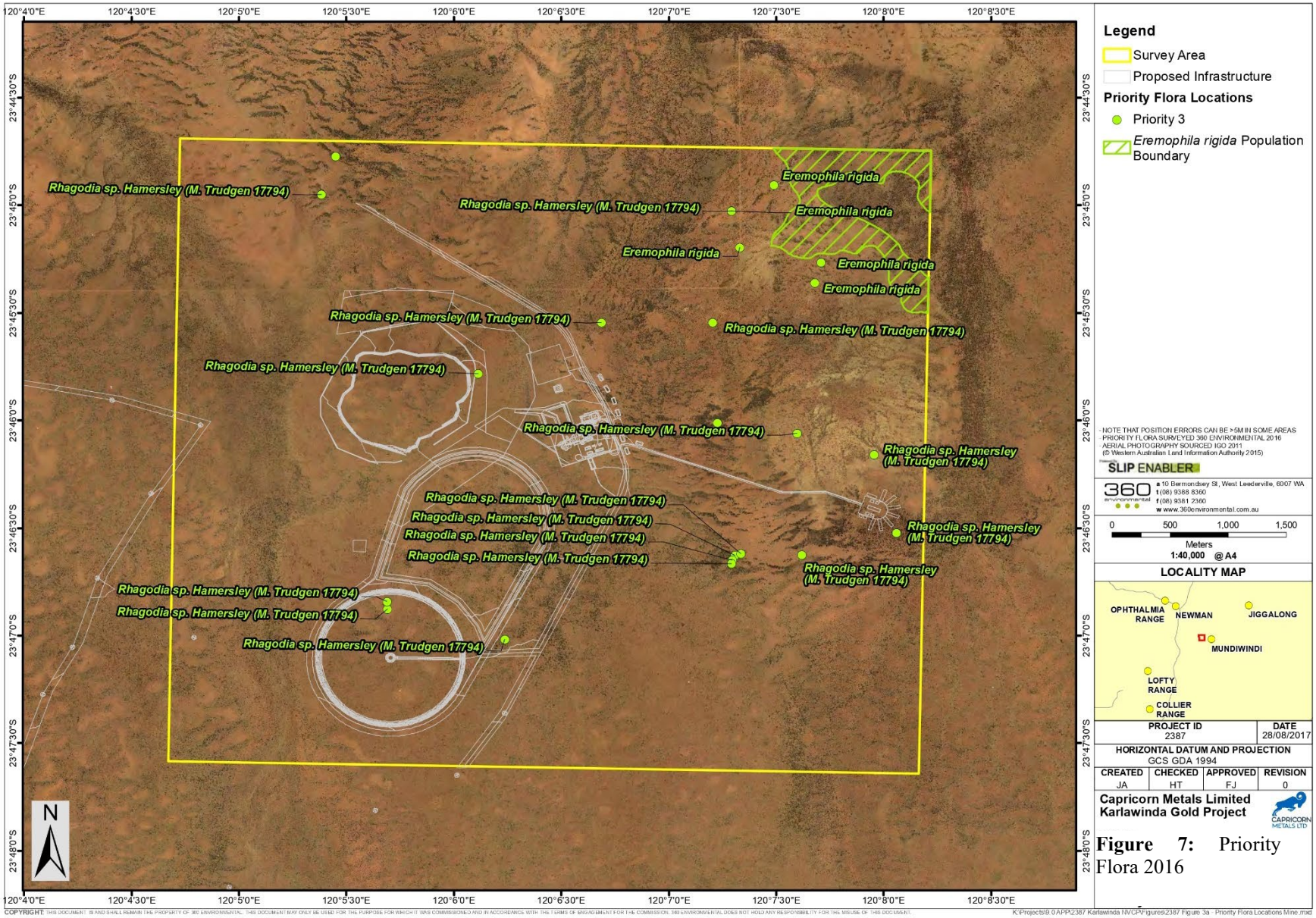


Figure 7: Priority Flora 2016

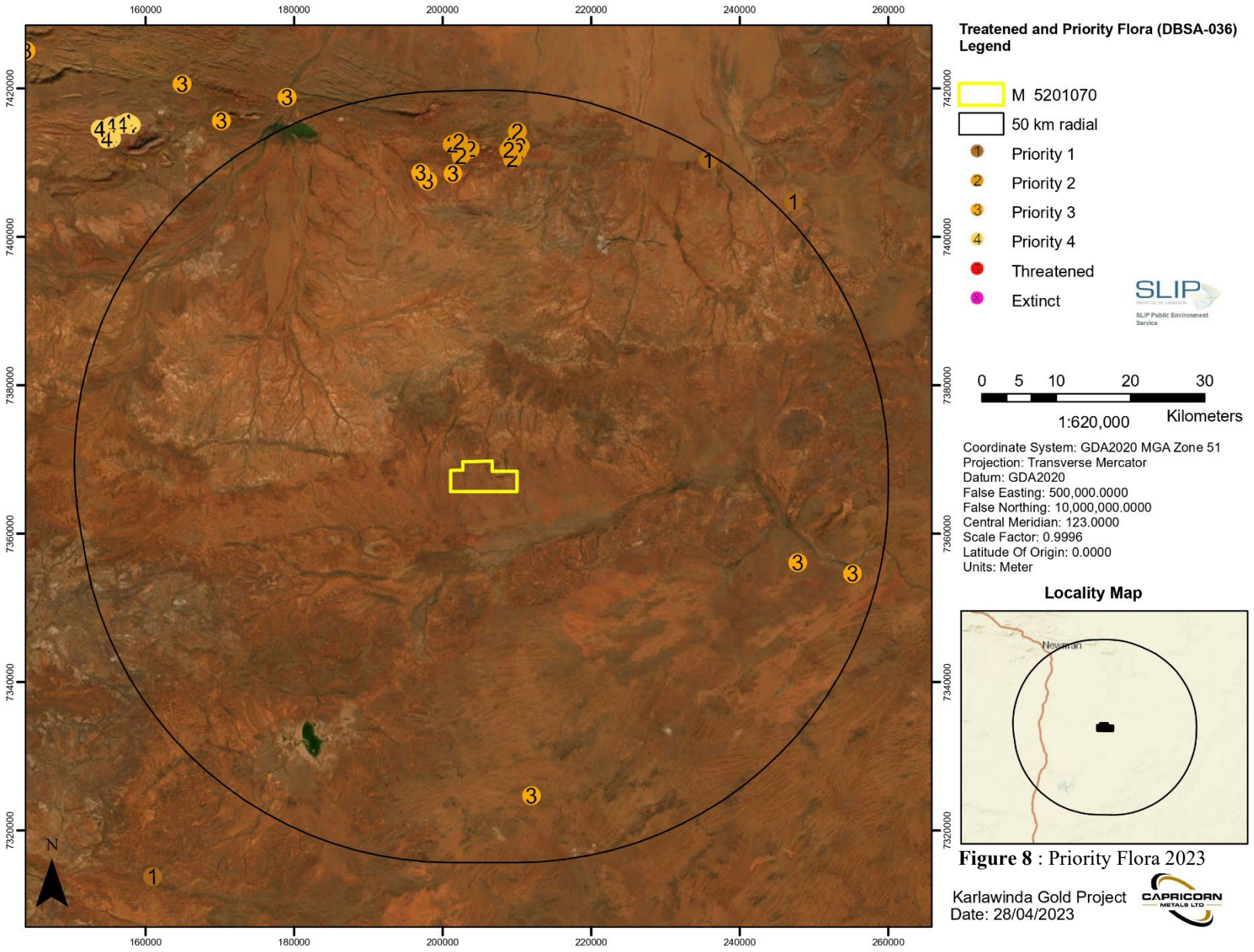


Figure 8 : Priority Flora 2023

Karlawinda Gold Project
Date: 28/04/2023

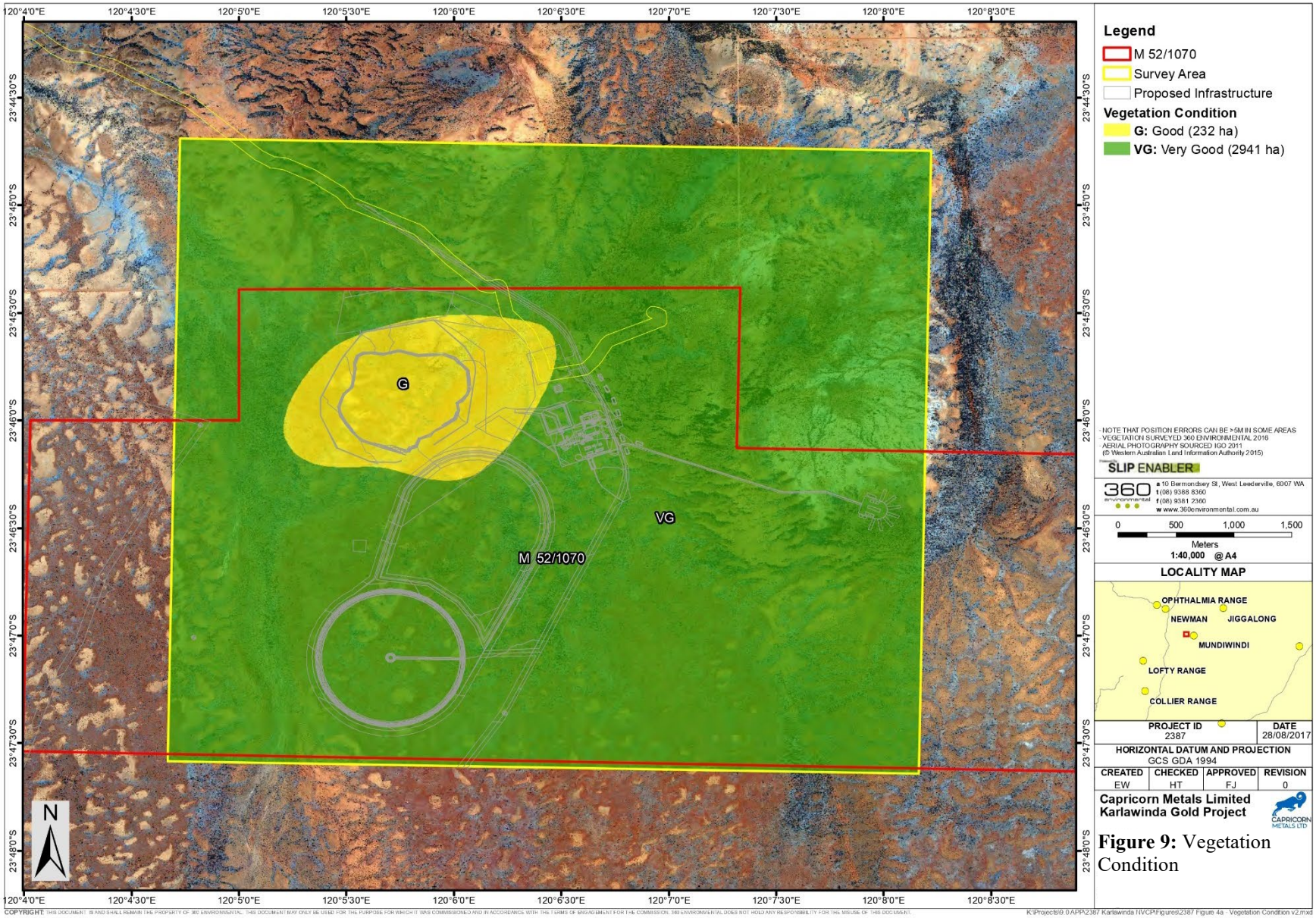


Figure 9: Vegetation Condition

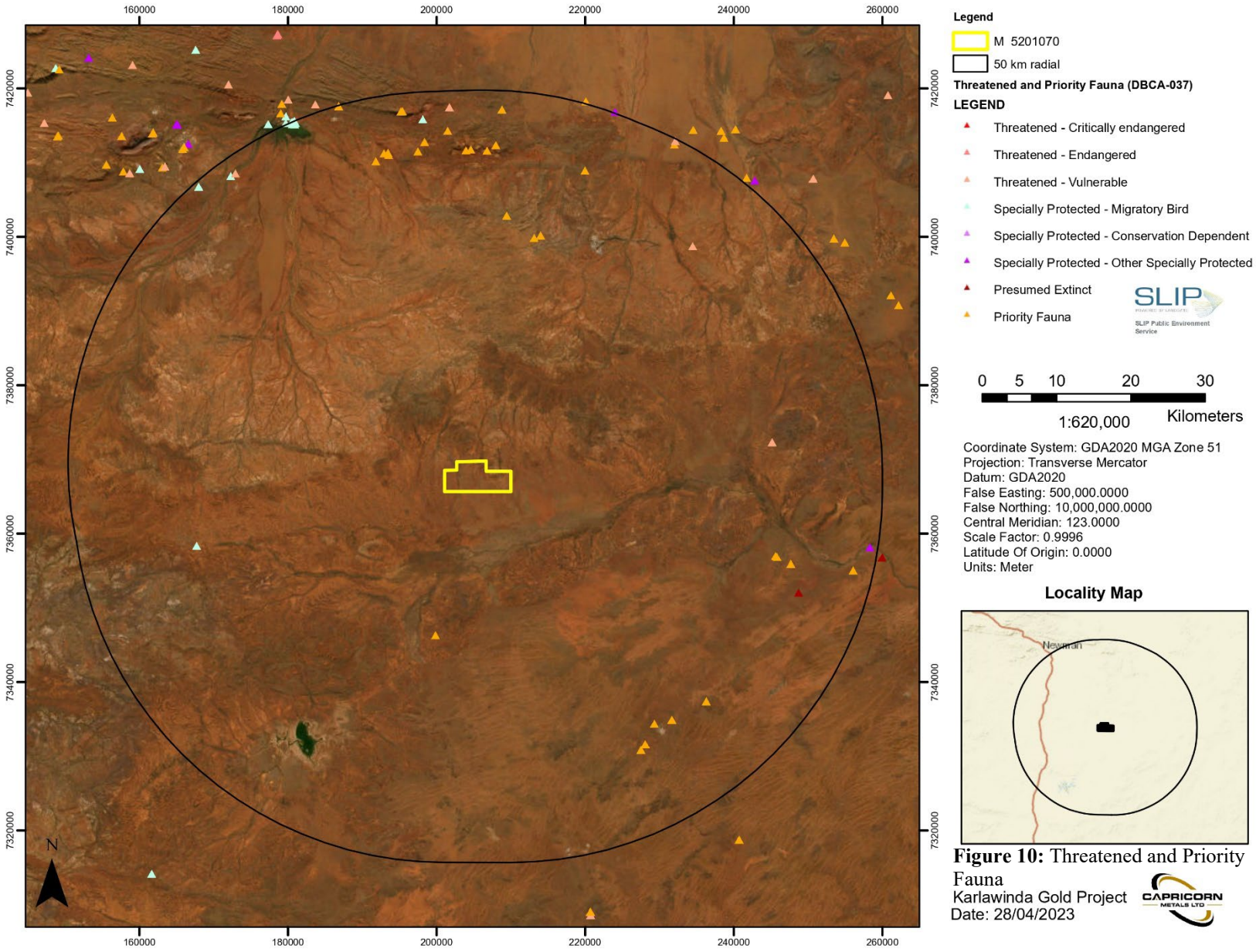


Figure 10: Threatened and Priority Fauna
Karlawinda Gold Project
Date: 28/04/2023

Threatened and Priority Fauna

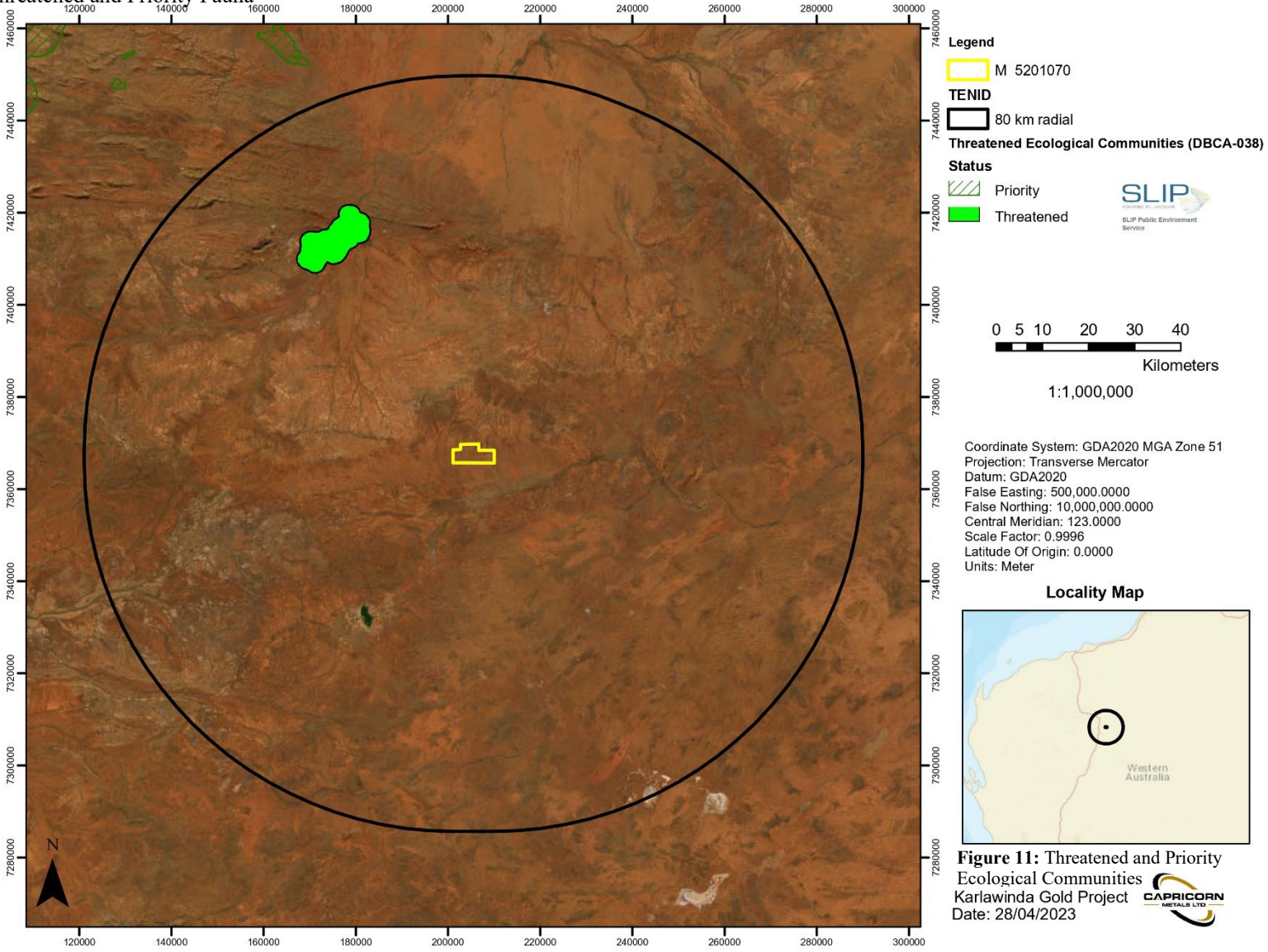


Figure 11: Threatened and Priority Ecological Communities
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Date: 28/04/2023

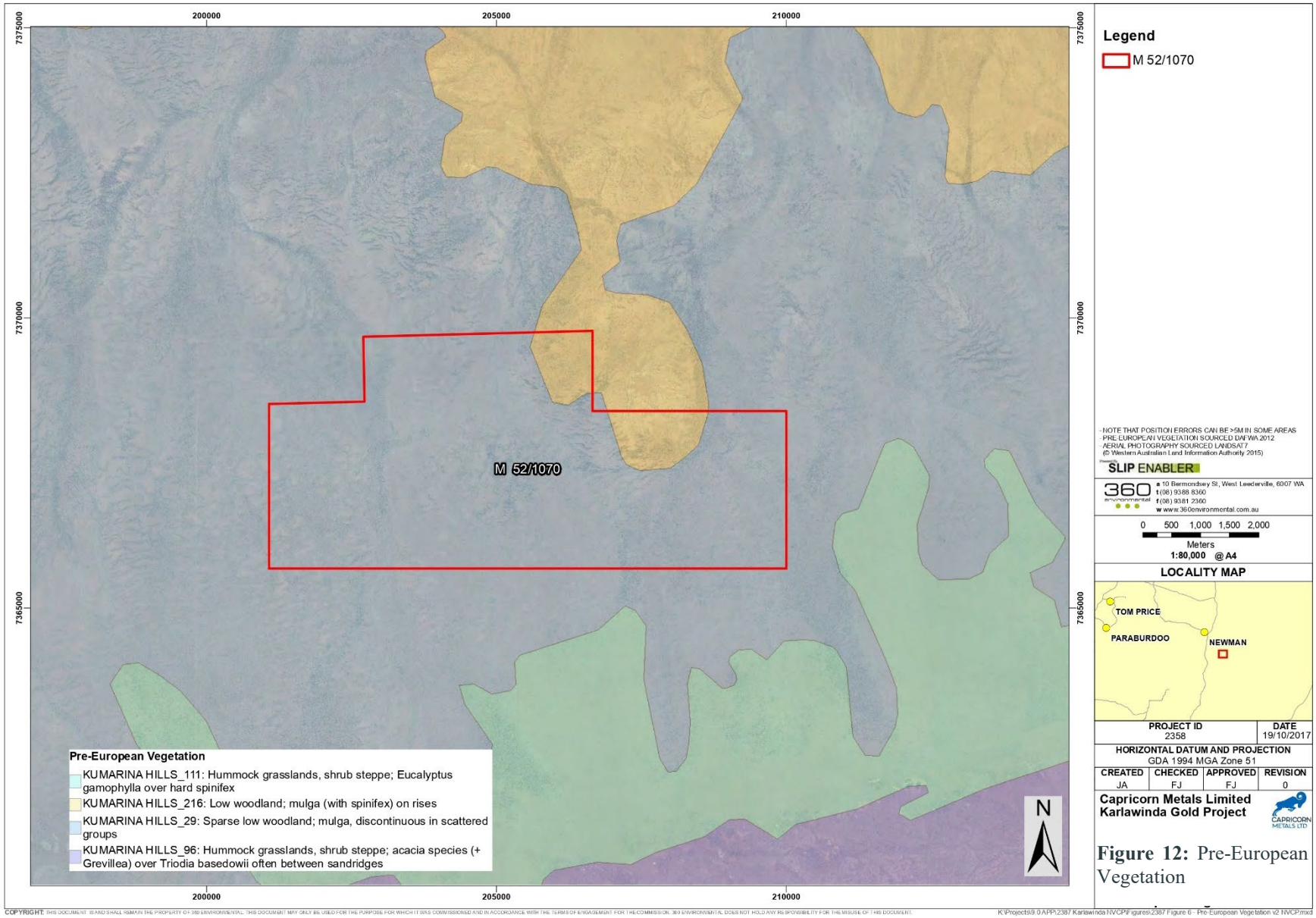

Figure 12: Pre-European Vegetation

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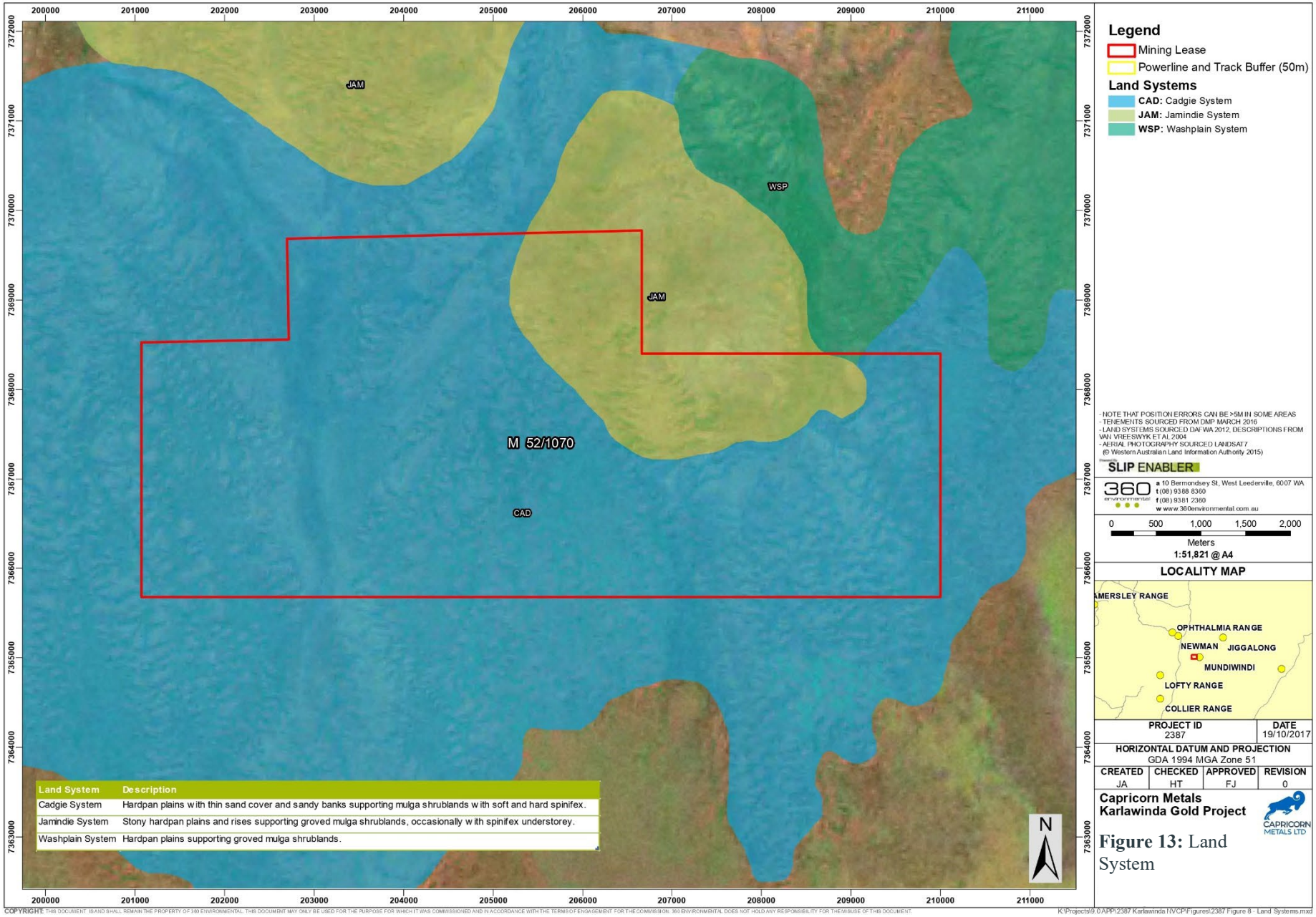

Figure 13: Land System

K:\Projects\9.0 APP\2387 Karlawinda NVCP\Figures\2387 Figure 8 - Land Systems.mxd

APPENDIX A Karlawinda Flora and Vegetation Assessment (2016)

APPENDIX B
Karlawinda Flora and Fauna Report (2010)

APPENDIX C
Vertebrate Fauna Review (2016)*

APPENDIX D
Desktop Risk Assessment for Subterranean Fauna and Short Range Endemics (2016)

APPENDIX E Targeted Bilby and Mulgara Survey (2016)

APPENDIX F
Pilot survey for subterranean and SRE fauna (2017)