

## Fielding's Gully Satellite Gold Project

### NVCP Application, Supplementary Information Report



Calidus Resources Limited

Fielding's Gully Satellite Gold Project

Native Vegetation Clearing Permit (NVCP), Supplementary Information Report

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This document has been prepared based on assumptions as reported throughout and upon information and data supplied by others.



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# 1 INTRODUCTION

## 1.1 PURPOSE AND SCOPE

Calidus Resources Limited (Calidus) is proposing to develop the Fielding’s Gully Satellite Gold Project, (Fieldings Gully) a gold mining operation approximately 20km south of Marble Bar in the Pilbara Region of Western Australia (WA) (Figure 1).

This document is to support a native vegetation clearing permit application for the Fielding’s Gully Project. The clearing permit area for Fielding’s Gully is represented by a 40.2 ha disturbance footprint within a 254.2 ha application area, comprising of two key elements:

- Construction of a new road and utility corridor
- Development of a small mine pit and associated infrastructure

## 1.2 ENVIRONMENTAL APPROVALS STATUS

This native vegetation clearing permit application is the first approval document to be submitted for the Fielding’s Gully Project.

Calidus is also operating the nearby Warrawoona Gold Project. Unlike Fielding’s Gully, the Warrawoona Gold Project is operating on a larger footprint and within conservation significant fauna habitat. As such the Warrawoona Gold project was referred to the Environmental Protection Authority (EPA) under Section 38 of the Environmental Protection Act 1986 (WA) (EP Act), with approval granted on the 20th August 2020 (Statement No. 1150). The Warrawoona Gold Project has also been granted environmental approval under Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), on 12 February 2021 (EPBC 2019/8584). The Fielding’s Gully Project will access groundwater and processing facilities associated with the Warrawoona Gold Project and as such will not require a Groundwater Licence or Works Approval / Operating Licence.

## 1.3 PROPONENT

Calidus is a company incorporated in Australia and has shares listed on the ASX (ABN 98 006 640 553). Calidus Resources is the holding company for Keras (Pilbara) Gold Pty Ltd, which holds the tenements associated with this application. Tenement summary reports are provided in Appendix 1.

All compliance and regulatory requirements regarding this assessment should be forwarded to the following address:

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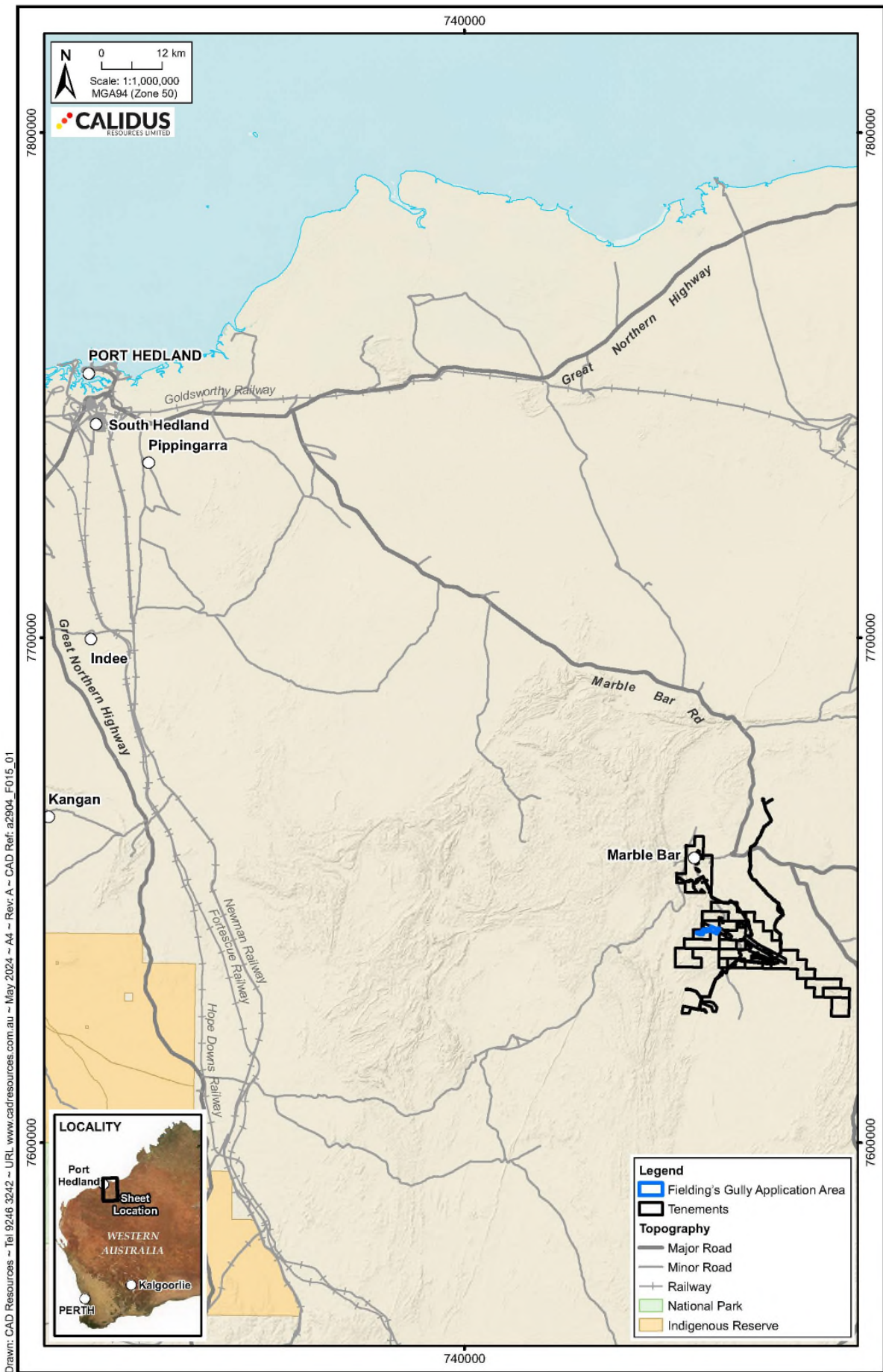


Figure 1 Regional location of Fielding's Gully

### 1.3.1 Environmental Record

Calidus is committed to the protection of the environment. The business objective is to plan and implement the Fielding’s Gully Project in a way that minimise the impact on the environment. To meet environmental objectives, Calidus are committed to the following actions and practices:

- Maintaining an environmental management standard.
- All staff and contractors will be made aware of the environmental policy and procedures with an appropriate level of training provided
- Act within the business towards reducing greenhouse gas emissions and environmental impact wherever possible
- Reduce and where possible, prevent pollution
- Facilitate recycling of materials and resources wherever possible
- Pursue a progressive rehabilitation program by returning disturbed areas where possible to pre-existing conditions
- Working to identify, assess and control environmental risks
- Encourage open dialogue with employees, regulators and the public on environmental issues and be responsive to their concerns
- Monitoring and review for continual improvement of the Company’s environmental performance

Calidus Executive and Management have held Statutory Positions at operating mine sites throughout Western Australia. No Calidus Director or Manager has previously been convicted, or paid a penalty, for an offence under a provision of the EPBC Act or the (WA) EP Act, or similar environmental protection or health-related legislation in Western Australia or elsewhere in Australia. Furthermore, Calidus Executive and Management have not had a licence or other authority suspended or revoked due to a breach of conditions or an offence under the EPBC Act or the (WA) EP Act or similar environmental protection or health-related legislation in Western Australia or elsewhere in Australia.

## 1.4 SUPPORTING STUDIES

The key environmental study for the Fielding’s Gully Project is:

- **Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024. Appendix 2.**
- **Groundwater Resource Management (GRS) (2023). Fielding’s Gully dewatering assessment and pit lake closure water balance. Appendix 3.**

For regional context, Calidus has also undertaken substantial investigations across a wide range of environmental factors at its the nearby Warrawoona Gold Project site, as summarised in Table 1. These nearby studies offer a clear understanding of habitat values in the area, and have provided Calidus with the context to determine the most appropriate approvals pathway for the Fielding’s Gully Project (i.e. NVCP).

**Table 1 Summary of studies completed by Calidus at the nearby Warrawoona Gold Project**

Investigation/Study	Reference
<b>Terrestrial fauna</b>	
Level 1 Vertebrate Fauna, Desktop SRE and Subterranean Assessment	(Biologic 2017b)
Monitoring bats of conservation significance near Marble Bar, Western Australia: November 2016	(Specialised Zoological 2017a)
Monitoring bats of conservation significance near Marble Bar, Western Australia: April 2017	(Specialised Zoological 2017b)
Targeted Bat Assessment, September 2017	(Biologic 2018a)
Targeted Bat Assessment, July 2018	(Biologic 2018b)

Investigation/Study	Reference
Targeted Bat Assessment, April 2019	(Biologic 2019a)
VHF Bat Foraging Studies 2018	(Biologic 2018c)
VHF Bat Foraging Studies 2019	(Biologic 2019b)
Habitat Assessment and Targeted Vertebrate Fauna Survey	(Biologic 2019c)
Significant Species Monitoring Survey Report (June 2019)	(Biologic 2019d)
<b>Invertebrate fauna</b>	
Short Range Endemic (SRE) Invertebrate Fauna Survey	(Biologic 2018d)
Subterranean Fauna Survey	(Biologic 2019g)
<b>Significant fauna impact assessment</b>	
Conservation Significant Bat Species Impact Assessment	(Biologic 2019e)
Conservation Significant Vertebrate Fauna Impact Assessment	(Biologic 2019h)
Assessment of Blasting at the Klondyke Queen for Pilbara Leaf-nosed Bat and Ghost Bat (including 2019 underground mining addendum)	(Blast It Global 2018)
Warrawoona Project – Klondyke Deposit Geotechnical Review of Blasting Report	(Peter O’Bryan and Associates 2019)
Environmental Noise Assessment: Warrawoona Gold Project, Marble Bar	(Lloyd George Acoustics 2019)
Assessment of Dust Emissions	(Environmental Technologies and Analytics 2019)
<b>Hydrology and Hydrogeology</b>	
Hydro-Meteorological and Surface Water Management Study	(GRM 2019a)
Hydrogeological Investigations	(GRM 2019b)
<b>Waste Characterisation and Management</b>	
Characterisation of Mine-Waste and Ore Samples: Implications for Mining-Stream Management	(GCA 2019a)
Characterisation of Mine-Tailings Slurry Sample and Implications for Mining-Stream Management	(GCA 2019b)
Tailings Storage Facility Design Report	(ATC Williams 2019)
<b>Soils and Landforms</b>	
Soils and landform assessment	(Mine Earth 2019)
<b>Flora and Vegetation</b>	
Warrawoona Gold Project Flora and Vegetation Survey	(Woodman Environmental 2019a)
<b>Aboriginal Culture and Heritage</b>	
2019 Calidus Warrawoona Gold Project Archaeological Site Avoidance Survey	(Sands CRM 2019)
2018 Calidus Warrawoona Gold Project Ethnographic Site Avoidance Survey	(Sands CRM 2018)



## 2 PROJECT DESCRIPTION

### 2.1 BACKGROUND

Fielding's Gully is located in the Pilbara region of Western Australia, approximately 20km south of Marble Bar (Figure 1). The resource is within the Warrawoona greenstone belt, which contains historic workings (mostly small shafts, stopes, and diggings) that have operated since the late 1800s. It comprises part of the Warrawoona Syncline, which accommodates several quartz lode gold deposits. The deposit is hosted within the Fielding's Find shear zones.

### 2.2 LAND TENURE

The application area is situated within tenements outlined in Table 2 and presented in Figure 2. Tenement summary reports are provided in Appendix 1. The application area is also almost entirely the Eginbah Pastoral Station.

**Table 2** Fielding's Gully tenements

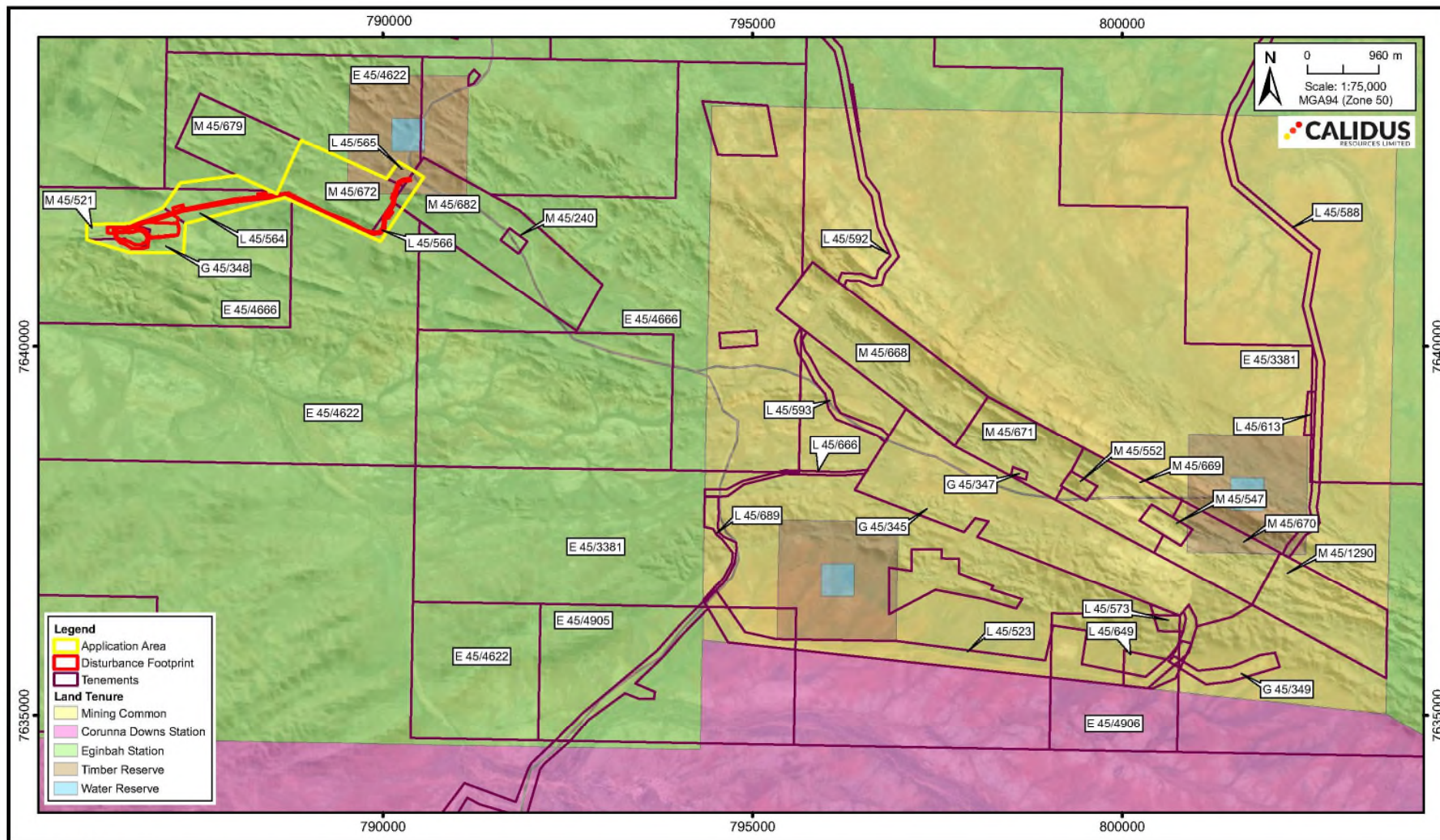
Tenement	Holder(s)	Status	End date
M45/521	Keras (Pilbara) Gold Pty Ltd	Live	10/03/2034
M45/672	Keras (Pilbara) Gold Pty Ltd	Live	01/08/2037
M45/682	Keras (Pilbara) Gold Pty Ltd	Live	17/04/2038
G45/348	Keras (Pilbara) Gold Pty Ltd	Live	21/02/2042
L45/564	Keras (Pilbara) Gold Pty Ltd	Live	24/11/2041
L45/566	Keras (Pilbara) Gold Pty Ltd	Live	24/11/2041
L45/565	Keras (Pilbara) Gold Pty Ltd	Live	25/11/2041
E45/4666	Keras (Pilbara) Gold Pty Ltd	Live	23/11/2026
E45/4622	Keras (Pilbara) Gold Pty Ltd	Live	04/05/2027

### 2.3 APPLICATION AREA

The indicative disturbance footprint is 40.2 ha (within an application area of 254.2 ha), as summarised in Table 3 and presented in Figure 3.

**Table 3** Estimated land disturbance for key components of the Fielding's Gully

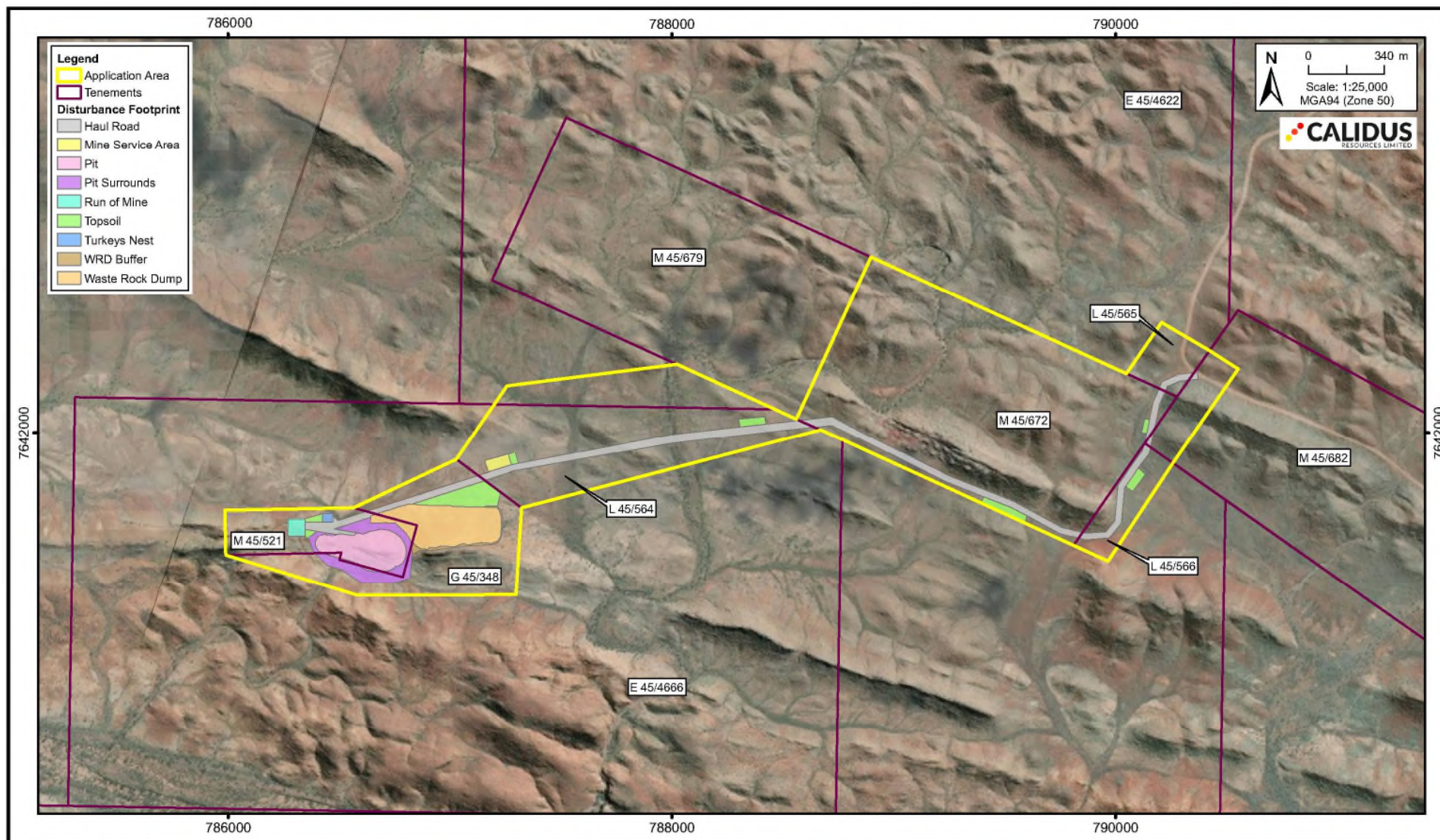
NVCP Application area components	Estimated Total Disturbance Area (ha)
Haul Road	15.4
Mine Service Area	0.6
Mine pit and surrounds	9.7
Run of Mine	0.6
Topsoil	4.8
Turkeys Nest	0.2
Waste Rock Dump	9.0
<b>Total</b>	<b>40.2 ha</b>



Source: DMIRS - Tenements  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_02, Rev: A

Figure 2 Warrawoona Gold Project tenements





Source: DMIRS - Tenements  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_03, Rev: A

**Figure 3 Native Vegetation Clearing Permit application area**

The location of each component considered the following factors:

- All known Heritage sites.
- Presence of conservation significant flora and fauna habitats.
- Locations of watercourses and associated flood zones.
- Potential mineralised areas.
- Landform and topography.
- Distances to other future project elements.
- Separation distances to protect human health.

### **2.3.1 Access Road**

Calidus proposes to construct approximately 5 km of an access road, to be used by light and heavy vehicles to haul ore to the Klondyke Processing Plant. The road will be approximately 20 m wide.

To minimise clearing, where possible, Calidus will upgrade existing exploration and pastoral tracks.

### **2.3.2 Borrow Pits**

Construction materials required will be sourced from borrow pits along the road corridor. The exact locations of borrow pits within the borrow envelope will be determined following geotechnical testing.

### **2.3.3 Topsoil Stockpiles**

Topsoil will be removed from areas of disturbance and stockpiled for future use during rehabilitation. Topsoil stockpiles will be situated within the indicative footprint of disturbance where possible. Topsoil stockpile areas have been designated throughout the Fielding's Gully area. The exact locations of topsoil stockpiles will be determined during project planning.

### **2.3.4 Construction Material Stockpiles**

Laydown and temporary stockpiles of materials may be required for construction. No specific clearing is required for laydown or temporary stockpiles as they will be temporarily located on areas cleared for other purposes (i.e. camp or borrow pit footprints).

### **2.3.5 Mobile Crushing and Screening**

Mobile crushing and screening may be required for construction materials. These activities will be undertaken within the indicative disturbance footprint and no additional clearing will be required.

### **2.3.6 Power**

Power will be generated via diesel generators. Diesel fuel will be stored within dual lined, self-bunded tanks as per Australian Standards.

### **2.3.7 Construction Water Supply and Storage Infrastructure**

Development of construction water supply infrastructure may be required at Fielding's Gully. It is anticipated that water supply will be sourced from local existing bore fields. A onsite turkeys nest will be constructed to store water.

Groundwater Resource Management Pty Ltd (GRM) have undertaken a dewatering assessment and pit lake closure water balance for mining of the Fielding's Gully deposit to assist with the relevant mining approvals.

### **2.3.8 Surface Water management**

Development of a surface water plan has been completed with a number of design options to manage a small tributary that leads into the proposed pit area. The surface water diversion will be assessed by DEMIRS in the Mining Proposal.

## 2.4 CLOSURE AND REHABILITATION

The nearby Warrawoona Gold Project is subject to a Mine Closure Plan (MCP), prepared in accordance with the *Guidelines for Preparing Mine Closure Plans* (DMIRS 2020). The Warrawoona Mine Closure Plan will be used as the foundation for the mine closure and rehabilitation at Fielding's Gully, and will include :

- Closure specific obligations and commitments;
- Key closure issues and management;
- Stakeholder consultation;
- Site-specific closure implementation plan including closure related tasks, materials required and allows for planned and unplanned scenarios;
- Post-mining land use and closure objectives;
- Site-specific and measurable completion criteria and monitoring program; and
- Financial costs associated with closure and rehabilitation.



## 3 EXISTING ENVIRONMENT

### 3.1 PHYSICAL ENVIRONMENT

#### 3.1.1 Climate

The Pilbara climate is variable, dominated by tropical cyclones or severe drought conditions. Marble Bar has a desert climate, with mean maximum daily temperatures ranging from 38°C - 42°C in summer and 27°C - 36°C in winter.

Precipitation in the Marble Bar area occurs mainly in the summer months with the peak of the wet season between December and March. Most of the rainfall results from thunderstorms and occasional tropical cyclones that cross the coast intermittently. The average monthly rainfall varies from 0.5 mm to 104 mm, with the mean long-term annual precipitation for the Marble Bar area about 386 mm.

An assessment of cyclones in the vicinity of the project area showed that over the last 48-year recording period, 22 cyclones crossed within 100km (approximately one every two or three years) and ten cyclones passed within 50km of the project area (approximately one every five years). In the majority of cases, cyclones bring heavy rainfall, causing runoff to occur in local watercourses (Groundwater Resource Management 2019a).

#### 3.1.2 Geology

The Pilbara region is formed of a basement of Archaean granite and volcanics, overlain by massive deposits of Proterozoic sediments and volcanics (Beard 1990). The Klondyke deposit lies within the Warrawoona Greenstone Belt of the East Pilbara Terrane. The rocks in the project area are assigned to the Warrawoona Group and comprise high-magnesium with lesser tholeiitic basalt, ultramafics and chert metamorphosed to greenschist facies. Locally, the Warrawoona Group rocks have been intruded between the Mt Edgar Granitoid Complex to the north and the Corunna Downs Granitoid Complex to the south.

#### 3.1.3 Landforms and Soils

The region is generally mountainous, rising to 1250m (metres), with hard alkaline red soils on plains and pediments, and shallow and skeletal soils on ranges.

The Abydos Plain is alluvial in origin near the coast, and of Archaean granite origin further inland. It is divided into a number of isolated sections by the Gorge Ranges. The main soils are hard alkaline red soils, some areas with coarse textured A-horizons to 45 cm thick, while other areas have shallow stony A-horizons in addition to patches of calcrete. On the eastern part of the plain near the De Grey River, the soils are chiefly neutral and acidic red earths, while on the inland plains behind the Gorge Ranges the chief soils are earthy loams and coarse sands overlying granite within 90 cm of the soil surface.

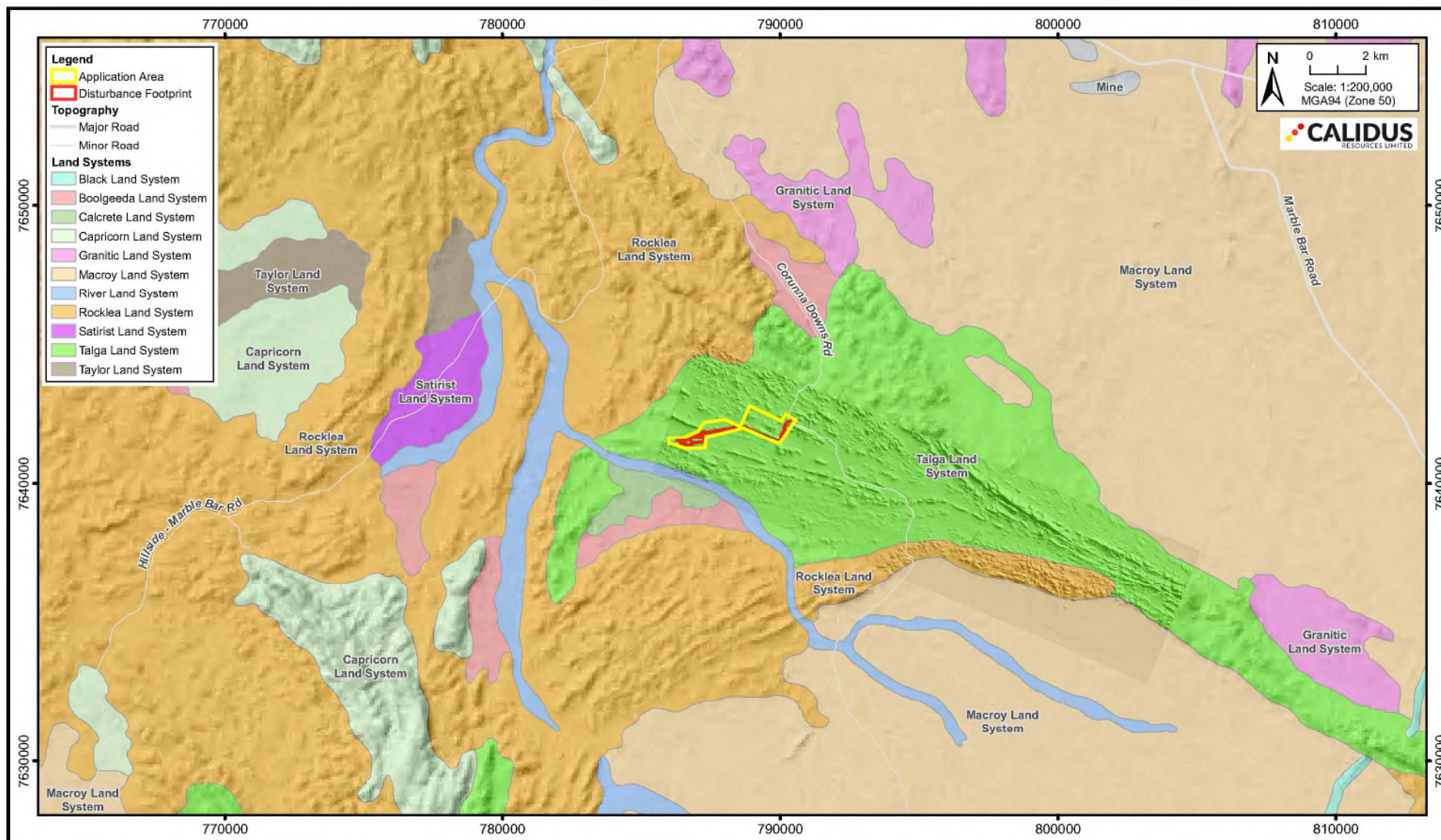
The Gorge Ranges are a rough, steep and abrupt range dissected by a number of rivers through narrow gorges. These ranges consist of Archaean and Lower Proterozoic rocks of sedimentary and volcanic origin, with basic lavas along with dolomites, tuff, banded-iron formations and dolerite dykes, with some narrow valley-plains and high-level gently undulating areas of limited extent. The soils are generally shallow and stony, with large areas without soil cover. Chief soils are brown loams with significant areas of earthy loams soils, with hard alkaline red soils occurring on lower slopes, and cracking and non-cracking clays on valley floors (Beard 1975).

#### 3.1.4 Land systems

The land systems of the Pilbara region are classified according to similarities in landform, soil, vegetation, geology and geomorphology, following van Vreeswyk et al. (2004). One land system (Talga) is mapped across entire application area (Table 4 and Figure 4). The Talga land system is described as hills and ridges of greenstone and chert, stony plains of hard and soft spinifex grasslands.

**Table 4 Talga Land system intersecting the project area (van Vreeswyk et al. 2004)**

Land System	Total Area Extent (ha)	Application Area (% of total extent)	Footprint (% of total extent)
Talga (280TI)	162233.4	254.2 ha (0.2%)	40.2 ha (0.02%)



Source: DMIRS - Tenements  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_04, Rev: A

Figure 4 Land systems of the Fielding's Gully application area

### 3.1.5 Topography

The nearby Warrawoona Ridge provides ~80 metres relief with ground elevation of ~250mAHD on the plains on either side of the ridge to about 330mAHD at the highest point. The topography across the survey area varies, showing a north-west to south-east alignment, clearly visible in the mountain ranges forming the landscape. The application area is situated on the plains between the mountain ranges and ridge lines.

### 3.1.6 Groundwater

Groundwater recharge in the area is episodic, and mostly as a result of summer storms or cyclone events. Recharge will be by direct infiltration through exposed outcrop, with secondary infiltration through the base of the local creek systems during runoff events.

Fractured rock aquifers are the most significant aquifers of the project area, along with smaller alluvial aquifers at the base of the main creek drainages and along the Coongan River, providing sufficiently thick alluvium sequences are developed.

Fractured rock aquifers generally develop around structural features such as faults and shears, especially where they intersect notable cross cutting structures. Secondary porosity from weathering of less resistive units can also enhance aquifer development. The fractured rock aquifers can have moderate to high permeability, although storage can be variable depending on the size of individual structures and fracture zones, and the degree of hydraulic connection between them.

The groundwater quality in the area is fresh to slightly brackish, and slightly alkaline. Dissolved metals concentrations in the groundwater were generally low, apart from arsenic and iron (GRM 2019b)

### 3.1.7 Surface Water

Fielding's Gully falls within the De Grey River basin, within the Coongan River catchment. The northwest striking Warrawoona Range forms a local surface water and groundwater divide. Runoff from the range proceeds to the Brockman Creek catchment to the north, which discharges to the Talga River or alternatively to the Coongan River catchment, approximately 4.4 kilometres north-west.

The Coongan River discharges into the Camel Creek in a southerly direction, with this creek located approximately 1 kilometre south of the western end of survey area, (Groundwater Resource Management 2019b). The flowlines proximal to the survey area are tributaries of the Coongan River. One unnamed tributary of the Camel Creek intersects the survey area twice as it winds its way in and out of its boundaries, as shown in Figure 5.

## 3.2 BIOLOGICAL ENVIRONMENT

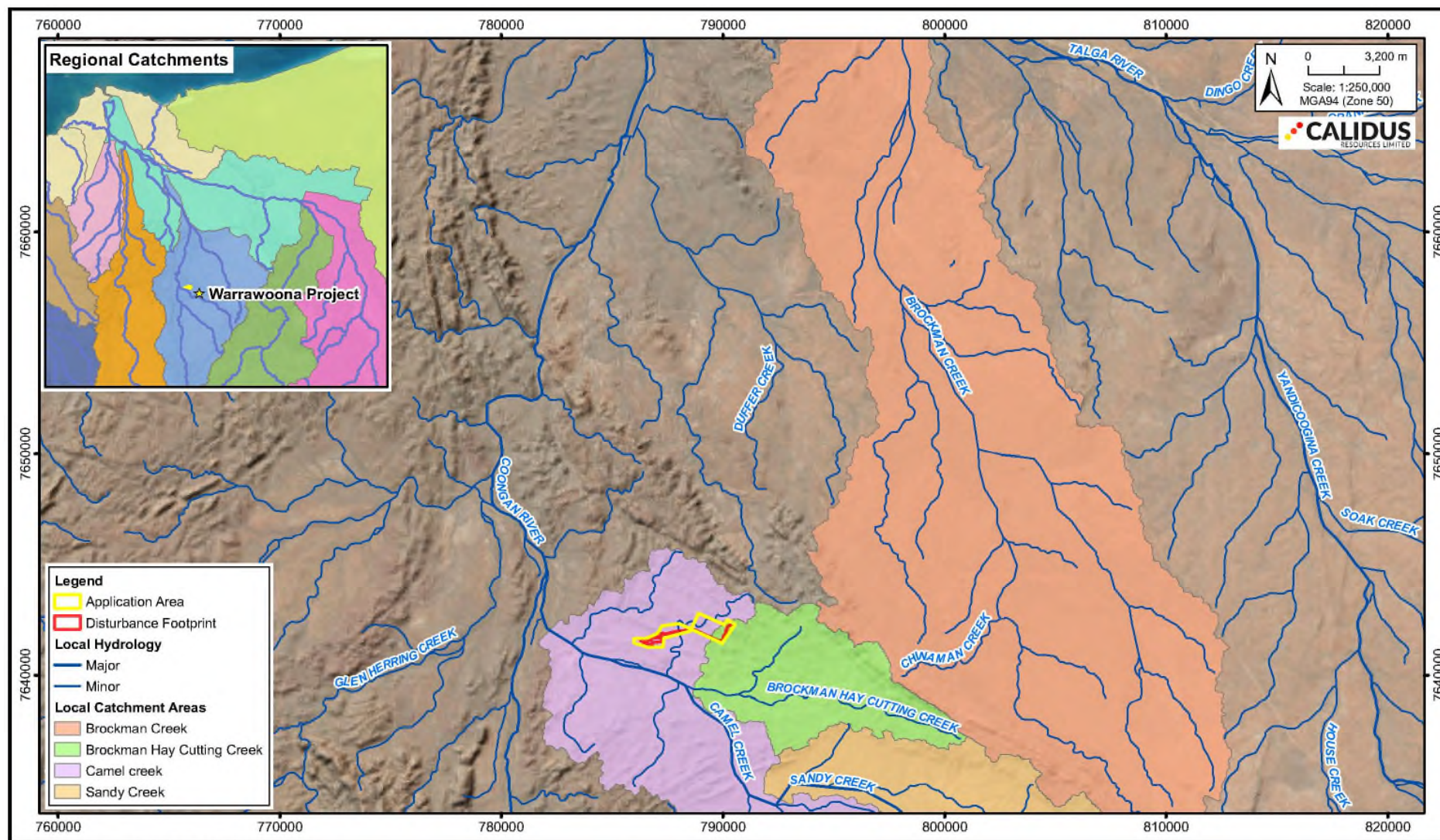
### 3.2.1 Biogeographic region

The bioregions of Australia are described in the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway & Cresswell 1995). Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features and plant and animal communities. The latest version, IBRA7, classifies Australia's landscapes into 89 large geographically distinct bioregions and 419 subregions (DoE 2012).

The application area is located within the Pilbara bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA). The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges (Thackway & Cresswell 1995). Vegetation is predominantly mulga low woodlands or snappy gum over bunch and hummock grasses (Bastin 2008).

The application area is located within the Chichester (PIL 1) IBRA subregion, comprised of undulating archaic granite and basalt plains with areas of basaltic ranges (Kendrick & McKenzie 2001). The plains support a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur through the ranges (Kendrick & McKenzie 2001).





Source: Geoscience Aust. - Hydrology, DWER - Catchments  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_05, Rev: A

Figure 5 Regional catchments of the Fielding's Gully application area

### 3.2.2 Regional Vegetation

Fielding’s Gully is situated in the Pilbara Botanical District in the Eremaean Botanical Province of Western Australia (Beard 1975).

Digital maps (spatial data) of pre-European vegetation communities, based on state-wide mapping by J.S. Beard at 1:250,000 scale, are published by the Department of Primary Industries and Regional Development (DPIRD) (Beard 2018). Fielding’s Gully is situated entirely within ‘association 82’ of the George Ranges vegetation system Figure 6. However, it is situated immediately adjacent to the border of the Abydos Plain 92 system-association, and elements of this are visible throughout the survey area as well.

The Gorge Ranges consist of tree steppe on the high rocky parts, often with only a sparse occurrence of trees, dominated by *Eucalyptus leucophloia* (formerly *E. brevifolia*) and hummock grasses of *Triodia epactia* and *T. brizoides*. The lower slopes are generally comprised of shrub steppe of *Acacia bivenosa* and *T. epactia*, while the valleys contain *A. pyriformis* (Beard 1975).

The Abydos Plain is characterised by four broad associations: Shrub steppe, Dwarf-shrub steppe, Grass plains and the Coastal Complex. Of these, shrub steppe is the only association relevant to the project area. Shrub steppe is the main community of the granite plain, which is dominated by the *Acacia pyriformis-Triodia epactia* (formerly *T. pungens*) association, with hummock grasses dotted with widely-spaced shrubs. The plain is broken by stony rises and hills with small ranges, with *T. epactia* usually replaced by *T. wiseana*, *T. longiceps* or *T. angusta*, with scattered shrubs. Larger ranges tend to possess mainly *Triodia*, with only a few scattered shrubs and trees. Major creeks and rivers are wooded with *Eucalyptus camaldulensis* and *Melaleuca argentea* (formerly *M. leucadendron*) (Beard 1975).

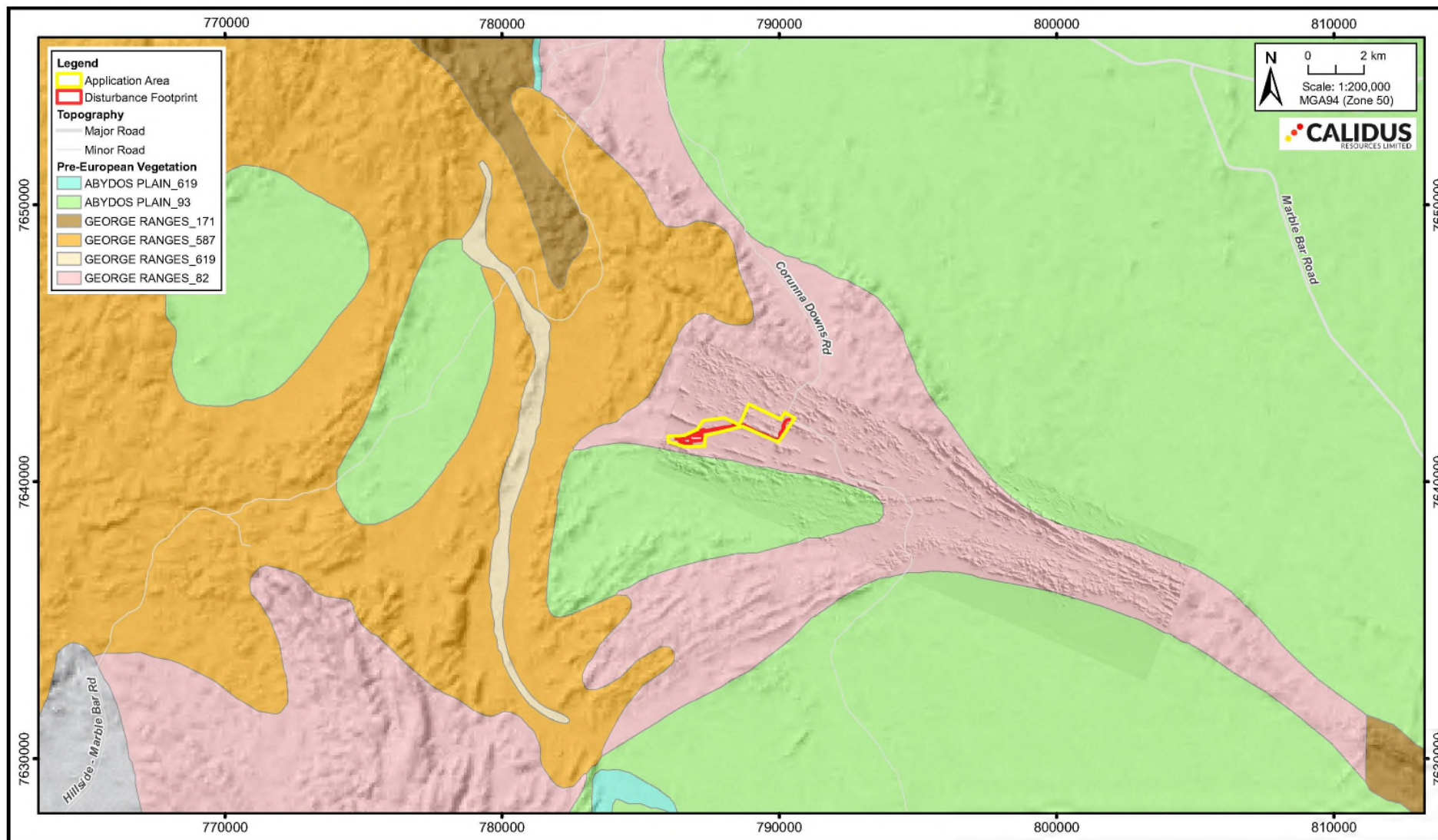
### 3.2.3 Local Vegetation

Detailed vegetation surveys recorded five vegetation types of Fielding’s Gully, based on PATN analysis of vegetation data, supported by landform and soil (Rapallo Environmental 2024) (Table 5 and Figure 7). Parts of the Fielding’s Gully survey area had been cleared or heavily disturbed in the past, but recorded some native vegetation regrowth. These areas are mapped as per the original native vegetation which had started to come back. Approximately 3.4 ha of the survey area comprised unsealed roads, and these are mapped as cleared.

**Table 5 Vegetation Types of Fielding’s Gully**

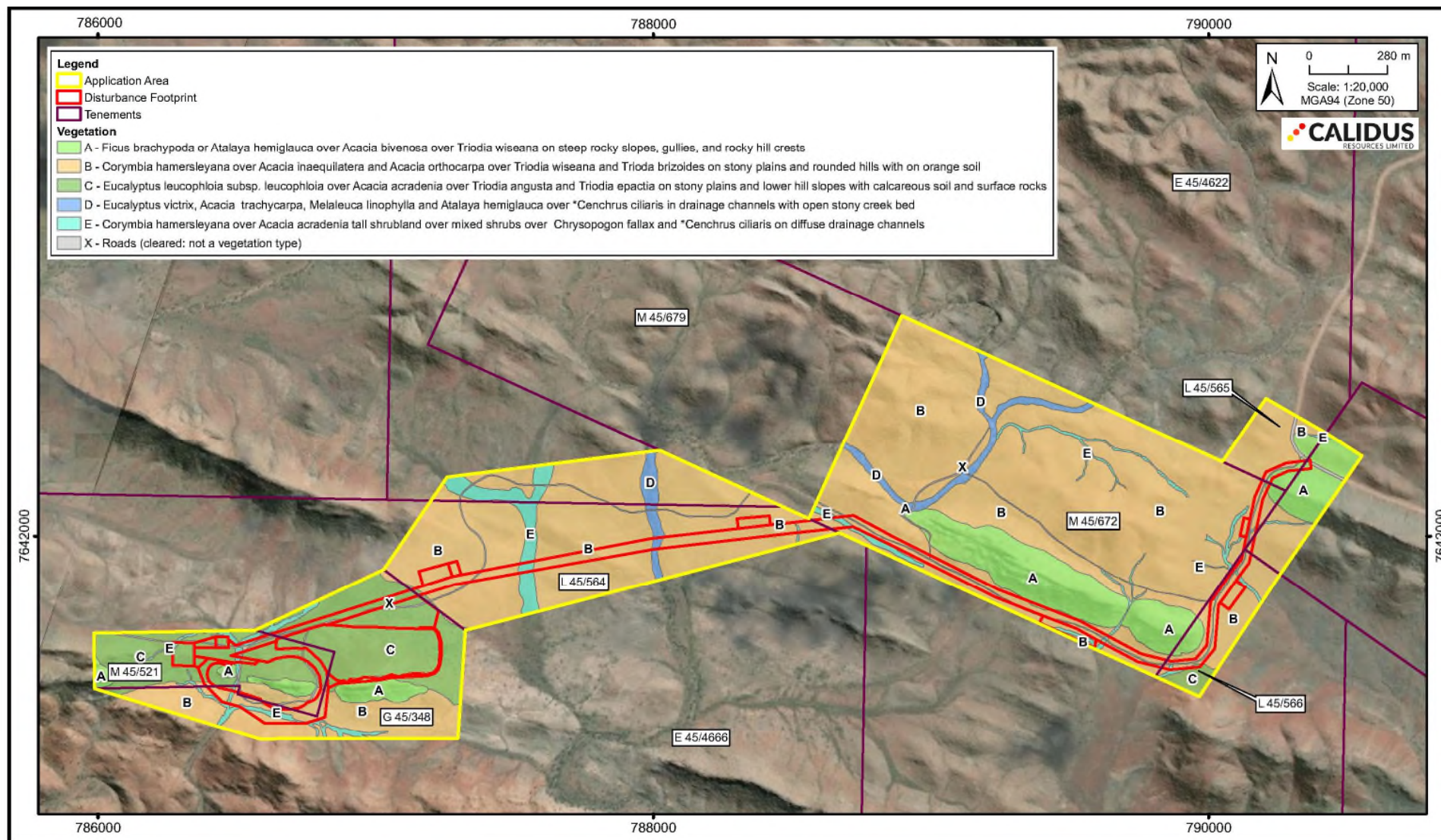
Total Area Extent (ha)	Application Area (% of total extent)	Footprint Area (% of total extent)
A - <i>Ficus brachypoda</i> or <i>Atalaya hemiglauca</i> over <i>Acacia bivenosa</i> over <i>Triodia wiseana</i> on steep rocky slopes, gullies, and rocky hill crests	26.9 ha (10.6%)	1.8 ha (4.5%)
B - <i>Corymbia hamersleyana</i> over <i>Acacia inaequilatera</i> and <i>Acacia orthocarpa</i> over <i>Triodia wiseana</i> and <i>Triodia brizoides</i> on stony plains and rounded hills with orange soil	176.0 ha (69.2%)	16.4 ha (40.7%)
C - <i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over <i>Acacia acradenia</i> over <i>Triodia angusta</i> and <i>Triodia epactia</i> on stony plains and lower hill slopes with calcareous soil and surface rocks	32.5 ha (12.8%)	18.8 ha (46.8%)
D - <i>Eucalyptus victrix</i> , <i>Acacia trachycarpa</i> , <i>Melaleuca linophylla</i> and <i>Atalaya hemiglauca</i> over <i>*Cenchrus ciliaris</i> in drainage channels with open stony creek bed	5.2 ha (2.0%)	0.1 ha (0.3%)
E - <i>Corymbia hamersleyana</i> over <i>Acacia acradenia</i> tall shrubland over mixed shrubs over <i>Chrysopogon fallax</i> and <i>*Cenchrus ciliaris</i> on diffuse drainage channels	10.2 ha (4.0%)	1.4 ha (3.5%)
X - Roads (not a vegetation type)	3.4 ha (1.4%)	1.7 ha (4.1%)





Source: DMIRS - Tenements  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_06, Rev: A

**Figure 6** Vegetation associations of the Fielding's Gully application area



Source: DMIRS - Tenements  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_07, Rev: A

Figure 7 Vegetation types of the Fielding's Gully application area



### 3.2.4 Local Flora

A flora survey of Fielding’s Gully (Rapallo Environmental 2024) recorded 137 flora taxa from 34 families. These included 134 native taxa and three introduced taxa (weeds). The most species-rich families recorded were the Fabaceae (wattles and peas) with 31 taxa, Malvaceae with 19 taxa, and Poaceae (grasses) with 16 taxa.

No conservation significant flora taxa were recorded.

The survey recorded five taxa which can be associated with groundwater dependent vegetation: *Eucalyptus camaldulensis/victrix*, *Melaleuca linophylla*, *Atalaya hemiglauca*, *Acacia coriacea* subsp. *pendens*, and *Cyperus vaginatus*. These taxa were recorded in vegetation type D, which comprised wide drainage channels flanked by tall river gums. Note, these five taxa are all considered to be facultative phreatophytes, which means they are also able to occur in areas without access to permanent groundwater. No obligate phreatophytes were recorded during the survey.

The three weeds recorded were \**Aerva javanica*, \**Calotropis procera*, and \**Cenchrus ciliaris*. Of these, \**Calotropis procera* (rubber bush) is a Declared Pest – s22(2), while the other two weed are listed Permitted – s11. \**Calotropis procera* was recorded from two locations.

### 3.2.5 Fauna Habitats

Four broad fauna habitat types were recorded at Fielding’s Gully (Table 6 and Figure 8), classified and identified based on topography, landforms, broad vegetation, soil type and surface substrate. Using topographical mapping and aerial photography, these habitats all appear to extend well beyond the application area.

**Table 6 Fauna habitats of Fielding’s Gully**

Broad fauna habitat	Application Area	Footprint Area (% of total extent)
Hillcrest/hillslope	195.8	24.1 ha (12.3%)
Stony plain	39.6	13 ha (32.8%)
Medium drainage	5.2	0.1 ha (2.4%)
Minor drainage	10.2	1.4 ha (13.7%)
Cleared, Roads (not habitat)	3.4	1.7 ha (48.5%)

### 3.2.6 Fauna Assemblages

A total of 294 vertebrate fauna species were identified as having the potential to occur within Fielding’s Gully (Rapallo Environmental 2024). These comprised 34 native and 4 introduced mammal species, 172 bird species, 75 reptile species, 7 amphibian species and 2 fish (note, not all species will occur due to a lack of permanent water bodies).

During field surveys, 42 species of vertebrate fauna were recorded (Rapallo Environmental 2024), including 26 species of birds, 13 mammal taxa (two of which are introduced species) and 3 reptile taxa. The majority of these were recorded as opportunistic sightings, while eight species of bat were recorded on SM4-U ultrasonic recorders, including the listed Pilbara Leaf-nosed bat (*Rhinioncteris aurantia* (Pilbara form)).

### 3.2.7 Introduced (feral) vertebrate fauna

The desktop study identified four species of introduced (feral) fauna which have been recorded previously within 100 km of the survey area all of which are mammals, the dromedary camel (*Camelus dromedarius*), cat (*Felix catus*), house mouse (*Mus musculus*) and cow (*Bos taurus*).

Evidence of two species of introduced fauna, cow (*Bos taurus*) and fox (*Vulpes vulpes*), was recorded during the fauna survey.

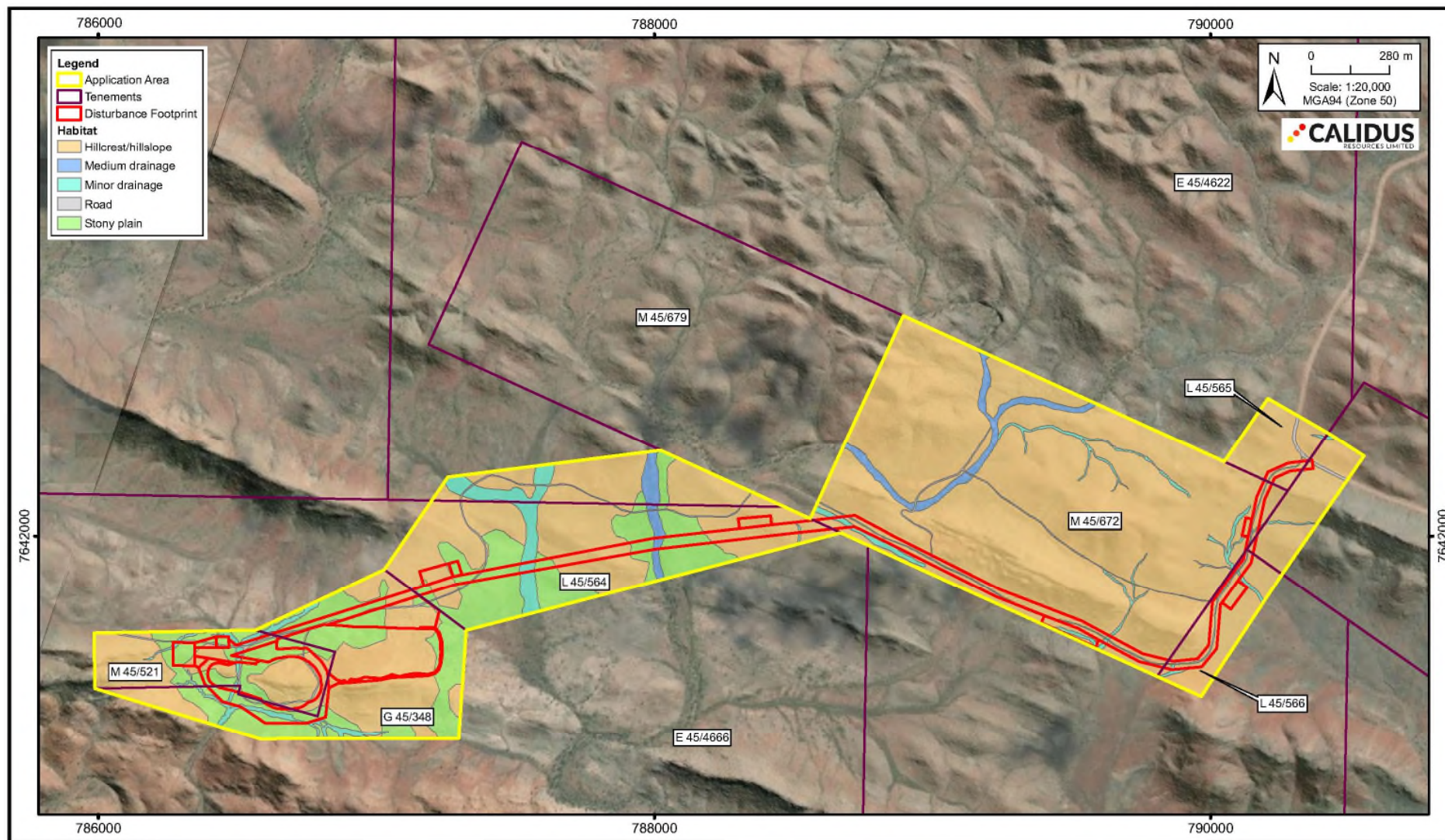


Figure 8 Fauna habitat types of the Fielding's Gully application area

### 3.2.8 Conservation significant fauna

Based on the likelihood assessment, 21 species of conservation significant fauna were assessed as confirmed, highly likely, likely, or possible to occur in the survey area. Of the species that are considered most likely to occur:

- The Pilbara leaf-nosed bat (*Rhinonictis aurantia* (Pilbara form)) was confirmed to occur in the survey area, with recordings captured during the survey at low numbers. This species occurs in roosts close to Warrawoona (Klondyke Queen and Bow Bells South historical workings). No known bat roosts or core roosting habitat occurs within the Fielding’s Gully application area
- The grey falcon (*Falco hypoleucos*) was confirmed to occur in the survey area, with one sighting of this species in active foraging flight.
- The northern quoll (*Dasyurus hallucatus*) and western pebble-mound mouse (*Pseudomys chapmani*) were ranked as highly likely to occur on the survey area.
- Ghost bat (*Macroderma gigas*), Pilbara olive python (*Liasis olivaceus barroni*), peregrine falcon (*Falco peregrinus*), long-tailed dunnart (*Antechinomys longicaudata*) and spectacled hare-wallaby (*Lagorchestes conspicillatus leichhardti*), were ranked as likely to occur on the survey area. No known bat roosts or core roosting habitat occurs within the Fielding’s Gully application area.

## 3.3 SOCIAL ENVIRONMENT

### 3.3.1 Current land use

Land use in the local area is generally mineral exploration and low-intensity cattle grazing.

### 3.3.2 Indigenous cultural heritage

The Nyamal Aboriginal Corporation RNTBC, and Palyku-Jartayi Aboriginal Corporation RNTBC are the registered Native Title claimant group of the project area (Determination Reference WCD2024/001).

No registered sites occur within the application area, however registered sites are known to occur within 20km of the project area (Table 7 and Figure 9).

**Table 7 Aboriginal Cultural Heritage Sites (DPLH-008) known to occur within 20km of Fielding’s Gully**

Cultural Heritage Identifier	Name	Place Status	Type
ACH-00011082	MARBLE BAR AREA	Register	Engraving
ACH-00007217	MARBLE BAR POOL	Register	Engraving; Grinding areas / Grooves
ACH-00007264	COODABINYA	Register	Artefacts/Scatter; Ritual/ Ceremonial; Grinding areas / Grooves
ACH-00007128	PIPUNYA SPRINGS BURIAL	Register	Burial
ACH-00011093	LIMESTONE STATION	Register	Engraving
ACH-00011091	SANDY CREEK JUNCTION	Register	Engraving
ACH-00011092	CORUNNA DOWNS: RADAR HILL	Register	Engraving
ACH-00011088	CORUNNA HOMESTEAD	Register	Engraving
ACH-00011095	CORUNNA HILL HOMESTEAD	Register	Artefacts / Scatter; Engraving
ACH-00011088	CORUNNA HOMESTEAD: HILL F	Register	Engraving
ACH-00039170	CRD-71-20	Lodged	Artefacts / Scatter; Ritual / Ceremonial; Historical; Landscape / Seascape Feature
ACH-00011957	DJUGUBUNYA MUNDA	Register	Creation / Dreaming Narrative



Cultural Heritage Identifier	Name	Place Status	Type
ACH-00011081	TEN PIN POOL	Register	Engraving

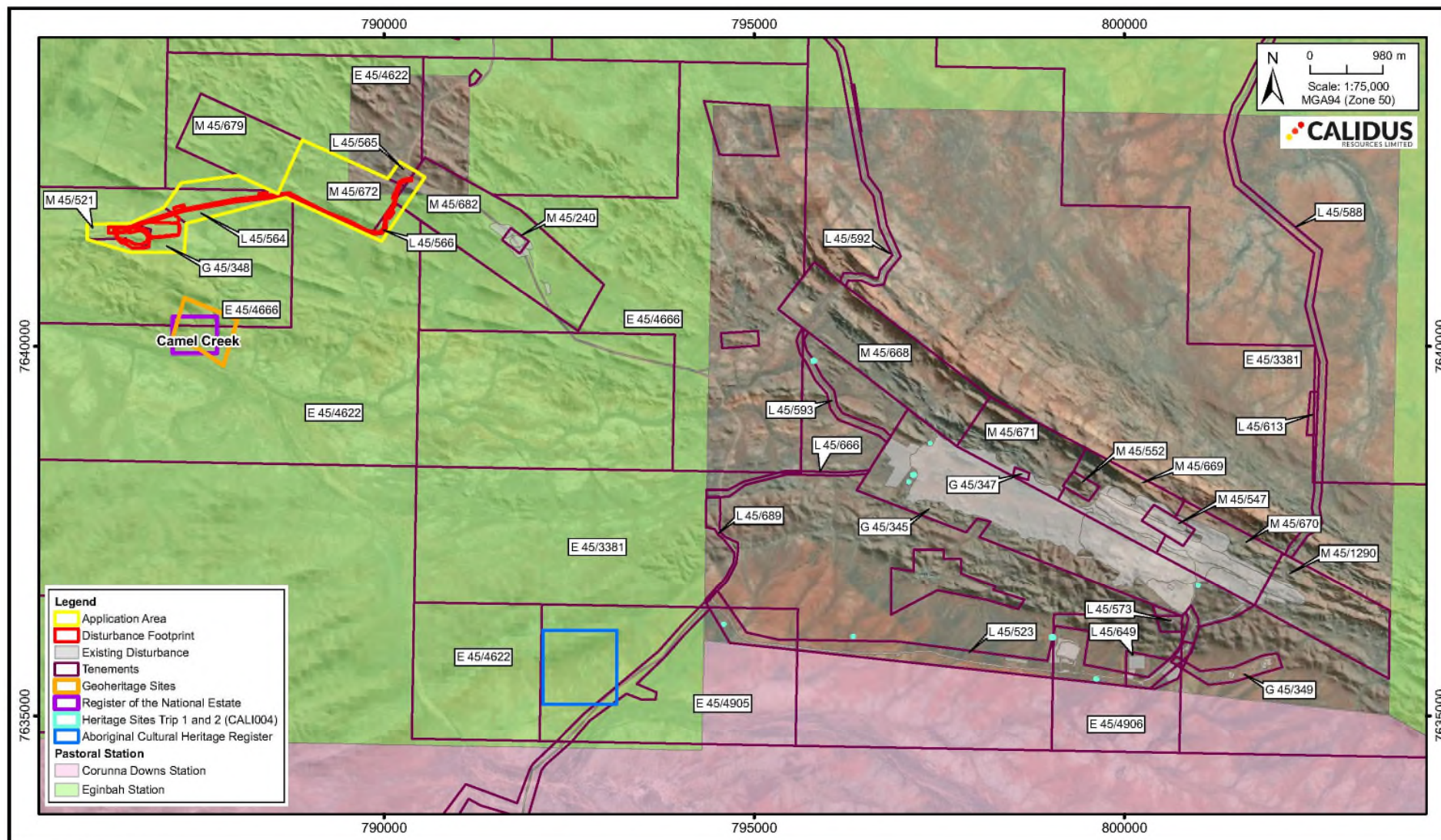
### 3.3.3 Non-indigenous and natural heritage

Databases, including National Heritage List; Register of the National Estate; Commonwealth Heritage List; World Heritage List; and Western Australian State Heritage Register all revealed no sites within the application area. There are known sites broader afield – particularly associated with the town of Marble Bar, as summarised in Table 8.

Fielding’s Gully is not situated within, or in close proximity to any Nature Reserves, Nationally Important Wetlands, Environmentally Sensitive Areas, or other protected areas.

**Table 8 Heritage Council WA Survey Sites (DPLH-008) known to occur within 20km of Fielding’s Gully**

Place No.	Place Name	Location
4,443	Marble Bar & Chinaman's Pool	3.5km west from the town of Marble Bar, Marble Bar
14,210	Marble Bar Old Cemetery	General St, Marble Bar
14,209	State Battery, Marble Bar	Halse Rd, Marble Bar
14,208	Machine Gun Nest	Cnr McCleod Cl & General St, Marble Bar
814	Government Buildings	26 Station St, Marble Bar
17,554	Marble Bar General Store	Lot 14B Francis St, Marble Bar
17,554	Marble Bar General Store	Lot 14B Francis St, Marble Bar
14,211	Memorial to Lonely Graves	Francis St, Marble Bar
14,209	State Battery, Marble Bar	Halse Rd, Marble Bar



Source: DMIRS - Tenements  
 Drawn: CAD Resources (08 9246 3242), Date: May 2024, CAD Ref: a2904\_F015\_09, Rev: A

Figure 9 Social values of the Fielding's Gully application area

## 4 ASSESSMENT AGAINST CLEARING PRINCIPLES

The proposed clearing of 40.2 ha has been assessed against the ten clearing principles, as provided in Schedule 5 of the EP Act. This assessment is presented in Table 9.

**Table 9 Assessment against the EP Act's Ten Clearing Principles**

Principle (a) Native vegetation should not be cleared if it comprises a high level of biological diversity																													
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>Woodman Environmental (2019) Detailed Flora and Vegetation Survey (formally Level 2) for the Warrawoona Gold Project.</li> </ul>																												
<b>Assessment</b>	<p>The proposed clearing footprint comprises approximately 40.2 ha of native vegetation, including areas already cleared, or regrowth from historically disturbed areas.</p> <p><b>Flora</b></p> <p>No conservation significant flora taxa were recorded within Fielding's Gully.</p> <p>A species accumulation curve, presented in Rapallo Environmental (2024), plots the number of flora taxa against the number of quadrats surveyed.</p> <p><b>Vegetation</b></p> <p>None of the vegetation types of the survey area matched any known TEC or PEC. The vegetation types of the survey area were considered typical for the region, and extended outside the boundaries of the survey area based on both aerial photography and existing biogeology mapping, and on earlier flora surveys completed for the nearby Warrawoona project.</p> <p>Of the five vegetation types mapped across the Fielding's Gully area, three (A, B, D, E) will all be removing less than 15% of the local surveyed extent (table below). Type C (Eucalyptus and Acacia over Triodia on stony plains) will be removing approximately 50% (18.8 ha) of the local mapped extent. None of the species within this vegetation type are of conservation significant, with the species composition and vegetation type widely distributed throughout the Pilbara.</p> <table border="1"> <thead> <tr> <th>Veg Type</th> <th>Description</th> <th>Mapped extent*</th> <th>Footprint (% of mapped extent)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td><i>Ficus brachypoda</i> or <i>Atalaya hemiglauca</i> over <i>Acacia bivenosa</i> over <i>Triodia wiseana</i> on steep rocky slopes, gullies, and rocky hill crests</td> <td>26.9 ha</td> <td>1.8 ha (6.8%)</td> </tr> <tr> <td>B</td> <td><i>Corymbia hamersleyana</i> over <i>Acacia inaequilatera</i> and <i>Acacia orthocarpa</i> over <i>Triodia wiseana</i> and <i>Triodia brizoides</i> on stony plains and rounded hills with orange soil</td> <td>176.0 ha</td> <td>16.4 ha (9.3%)</td> </tr> <tr> <td>C</td> <td><i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over <i>Acacia acradenia</i> over <i>Triodia angusta</i> and <i>Triodia epactia</i> on stony plains and lower hill slopes with calcareous soil and surface rocks</td> <td>32.5 ha</td> <td>18.8 ha (57.9%)</td> </tr> <tr> <td>D</td> <td><i>Eucalyptus victrix</i>, <i>Acacia trachycarpa</i>, <i>Melaleuca linophylla</i> and <i>Atalaya hemiglauca</i> over <i>*Cenchrus ciliaris</i> in drainage channels with open stony creek bed</td> <td>5.2 ha</td> <td>0.1 ha (2.4%)</td> </tr> <tr> <td>E</td> <td><i>Corymbia hamersleyana</i> over <i>Acacia acradenia</i> tall shrubland over mixed shrubs over <i>Chrysopogon fallax</i> and <i>*Cenchrus ciliaris</i> on diffuse drainage channels</td> <td>10.2 ha</td> <td>1.4 ha (13.7%)</td> </tr> <tr> <td>X</td> <td>Cleared, roads</td> <td>3.4 ha</td> <td>1.7 ha (48%)</td> </tr> </tbody> </table> <p>*Rapallo Environmental (2024) survey</p>	Veg Type	Description	Mapped extent*	Footprint (% of mapped extent)	A	<i>Ficus brachypoda</i> or <i>Atalaya hemiglauca</i> over <i>Acacia bivenosa</i> over <i>Triodia wiseana</i> on steep rocky slopes, gullies, and rocky hill crests	26.9 ha	1.8 ha (6.8%)	B	<i>Corymbia hamersleyana</i> over <i>Acacia inaequilatera</i> and <i>Acacia orthocarpa</i> over <i>Triodia wiseana</i> and <i>Triodia brizoides</i> on stony plains and rounded hills with orange soil	176.0 ha	16.4 ha (9.3%)	C	<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> over <i>Acacia acradenia</i> over <i>Triodia angusta</i> and <i>Triodia epactia</i> on stony plains and lower hill slopes with calcareous soil and surface rocks	32.5 ha	18.8 ha (57.9%)	D	<i>Eucalyptus victrix</i> , <i>Acacia trachycarpa</i> , <i>Melaleuca linophylla</i> and <i>Atalaya hemiglauca</i> over <i>*Cenchrus ciliaris</i> in drainage channels with open stony creek bed	5.2 ha	0.1 ha (2.4%)	E	<i>Corymbia hamersleyana</i> over <i>Acacia acradenia</i> tall shrubland over mixed shrubs over <i>Chrysopogon fallax</i> and <i>*Cenchrus ciliaris</i> on diffuse drainage channels	10.2 ha	1.4 ha (13.7%)	X	Cleared, roads	3.4 ha	1.7 ha (48%)
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X	Cleared, roads	3.4 ha	1.7 ha (48%)																										

	Clearing 40.2 ha of ubiquitous Pilbara vegetation within the application area is unlikely to impact biological diversity in the surrounding area as it does not represent an area of high biodiversity.																		
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.																		
<b>Principle (b)</b>	<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</b>																		
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>• Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>• Woodman Environmental (2019) Detailed Flora and Vegetation Survey (formally Level 2) for the Warrawoona Gold Project.</li> <li>• Biologic (2018d) Warrawoona Gold Project. SRE Invertebrate Fauna Survey. Calidus Resources Limited.</li> <li>• Biologic (2018e) Warrawoona Level 1 Fauna Assessment. Report prepared for Calidus Resources Limited. February 2018.</li> <li>• Biologic (2019a) Warrawoona Targeted Bat Assessment - April 2019. Report prepared for Calidus Resources Limited. May 2019.</li> <li>• Biologic (2019b) Warrawoona Gold Project: VHF Bat Foraging Studies. Report prepared for Calidus Resources Limited. March 2019.</li> <li>• Biologic (2019c) Warrawoona Gold Project: Habitat Assessment and Targeted Vertebrate Fauna Survey. Report prepared for Calidus Resources Limited, 22 February 2019.</li> <li>• Biologic (2019d) Warrawoona Gold Project: 2019 Significant Species Survey. June 2019. Prepared for Calidus.</li> <li>• Biologic (2019e) Warrawoona Gold Project: Conservation Significant Bat Species Impact Assessment (Impact assessment Report).</li> <li>• Biologic (2019f) Warrawoona Gold Project. Conservation Significant Vertebrate Fauna Impact Assessment.</li> </ul>																		
<b>Assessment</b>	<p>Clearing for the development of the Fielding’s Gully satellite deposit, will result in the removal of approximately 40.2 ha of native vegetation and fauna habitat.</p> <p>The proposed clearing footprint includes a relatively small proportion of the local mapped extent for each habitat type (table below).</p> <table border="1" data-bbox="379 1473 1225 1720"> <thead> <tr> <th>Fauna Habitat</th> <th>Total Mapped extent*</th> <th>Footprint (% of mapped extent)</th> </tr> </thead> <tbody> <tr> <td>Hillcrest/hillslope</td> <td>195.8 ha</td> <td>24.1 ha (12.3%)</td> </tr> <tr> <td>Medium drainage</td> <td>5.2 ha</td> <td>0.1 ha (2.4%)</td> </tr> <tr> <td>Minor drainage</td> <td>10.2 ha</td> <td>1.4 ha (13.7%)</td> </tr> <tr> <td>Stony plain</td> <td>39.6 ha</td> <td>13.0 ha (32.8%)</td> </tr> <tr> <td>Cleared, Road</td> <td>3.4 ha</td> <td>1.7 ha (48.5%)</td> </tr> </tbody> </table> <p>Habitat preferred by key fauna of the region, and its resence within the Fieldings Gully area, is described in detailed below.</p> <p><b>Northern quoll (no record on site)</b></p> <p>Drainage habitats are known foraging and dispersal pathways for Northern quoll. Hillcrest/hillslope habitat can be utilised by foraging or dispersing quolls, however, these habitats are unlikely to support the species if they are not adjacent to or in close proximity to denning habitat.</p>	Fauna Habitat	Total Mapped extent*	Footprint (% of mapped extent)	Hillcrest/hillslope	195.8 ha	24.1 ha (12.3%)	Medium drainage	5.2 ha	0.1 ha (2.4%)	Minor drainage	10.2 ha	1.4 ha (13.7%)	Stony plain	39.6 ha	13.0 ha (32.8%)	Cleared, Road	3.4 ha	1.7 ha (48.5%)
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**Night parrot (no record on site)**

The survey area does contain some maturing *Triodia* habitat at some less frequently burnt localities (>40cm high), which a preference for the night parrot. However key aspects of mature *Triodia* habitat are not found at Fielding’s Gully, such as mosaics with samphire and chenopod shrublands or salt-lake margin, or areas that would not burn during a large fire resulting in patches of big, old *Triodia*, protected via bare soil, the edge of a salt lake and/ or nearby rocky country.

**Ghost bat (no record on site)**

The Ghost bat will often forage more broadly across habitats, often utilising drainage lines and other habitats where prey species are likely to be most abundant (Richards et al. 2008, Tidemann et al. 1985). In the Pilbara, ghost bats have been found to prefer to forage on productive plain areas with thin mature woodland over patchy or clumped tussock or hummock grass (*Triodia* spp.) on sand or stony ground.

No caves or old workings were recorded at Fieldings Gully, as such ghost bat habitat within the area is potential foraging only (drainage, stony plain, hillcrest/hillslope).

**Pilbara Leaf-nosed Bat (recorded on site)**

The Pilbara leaf-nosed bat requires deep caves with high levels of humidity and stable temperatures (Churchill 2008). The species has a very limited ability to conserve heat and water and requires very hot (28-32°C) and humid (96-100%) roost sites in caves and/or abandoned mines (Armstrong 2001).

The Fielding’s Gully area does not contain habitat that could provide caves for roosting but contains foraging habitat. Bat Call WA confirmed that the timing of the recorded calls at Fielding’s Gully is consistent with individuals originating from the known roosts located proximal to the Warrawoona Gold Project (6-10 km to the southeast), rather than originating from Fielding’s Gully.

**Greater bilby (no record on site)**

Within the Pilbara region, the species is often sparsely distributed and occurs in relatively low abundance, making detection difficult (Southgate et al. 2018).

No evidence of Greater bilby was recorded at Fielding’s Gully; nor was the species detected via targeted searches for the Warrawoona Gold Project (Biologic 2019c). Habitat within the survey area is largely unsuitable for the species to burrow.

**Grey falcon (recorded on site)**

One grey falcon was observed within the survey area hunting in drainage lines. Grey falcon commonly nests in timbered areas, particularly tall trees along watercourses, and forages in open or more sparsely vegetated habitats (Garnett et al. 2011). Medium drainage habitats are likely to provide suitable nesting habitat for the species. Grey falcon is likely to forage more broadly across all habitats within the survey area particularly stony plain and minor drainage habitats.

**Pilbara olive python (no record on site)**

Within inland Pilbara the species is most often encountered near permanent waterholes in rocky ranges or among riverine vegetation (Pearson 1993). Habitat suitable for the species within the survey area includes the hillcrest/hillslope and habitat drainage habitats used for foraging and dispersal.

The nearest record of Pilbara olive python is located within the Klondyke Queen historic underground proximal to the Warrawoona Gold Project (Biologic 2019c). Additional records are approximately 20 km north-west of the Warrawoona Gold Project (DBCA 2023a. ) and the species was recorded from within the Corunna Downs project area (MWH, Australia 2016).



	<p><b>Northern brushtail possum</b></p> <p>The species is most often recorded from major drainage lines that contain large hollow-bearing eucalypts and rocky habitats (i.e. gorge/ gully habitat) where suitable shelter sites are present throughout its arid distribution (Kerle et al. 1992; Van Dyck &amp; Strahan 2008).</p> <p><b>Peregrine falcon, Falco peregrinus</b></p> <p>In arid areas, the Peregrine falcon is most often encountered along cliffs above rivers, ranges and wooded watercourses where it hunts birds (Johnstone &amp; Storr 1998). It typically nests on rocky ledges occurring on tall, vertical cliff faces between 25 m and 50 m high (Olsen &amp; Olsen 1989). The Peregrine falcon is considered rare over much of its range (Johnstone &amp; Storr 1998).</p> <p>The Peregrine falcon was recorded in 2001, ca. 1.5 kilometres to the southwest of the survey area on Camel Creek (DBCA 2023a). The drainage habitats and open hillcrest/hillslope and stony plain are likely to provide suitable foraging habitat for the species that may nest on vertical cliff faces of the Warrawoona Range.</p> <p>Although the habitat of the application area is of moderate significance, the proposed clearing footprint is not considered to represent habitat critical for fauna species, therefore the nature and scale of vegetation to be cleared is not considered to be significant at a local or regional scale.</p>																																								
<b>Outcome</b>	The proposed clearing is unlikely to be at variance with this Principle.																																								
<b>Principle (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora</b>																																									
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>Woodman Environmental (2019a) Detailed Flora and Vegetation Survey (formally Level 2)</li> </ul>																																								
<b>Assessment</b>	<p>A total of 25 flora quadrats (50 by 50 metres) and 9 relevés were sampled throughout the survey area with approximately 620 flora specimens collected for identification.</p> <p>The desktop search identified 53 conservation significant taxa. These were assessed for likelihood to occur in the Fielding Gully area, as summarised in the table below.</p> <table border="1" data-bbox="379 1368 1374 1619"> <thead> <tr> <th rowspan="2">Likelihood</th> <th colspan="5">Conservation Significance</th> <th rowspan="2">Total</th> </tr> <tr> <th>Endangered</th> <th>Priority 1</th> <th>Priority 2</th> <th>Priority 3</th> <th>Priority 4</th> </tr> </thead> <tbody> <tr> <td>Likely</td> <td></td> <td>1</td> <td></td> <td></td> <td>1</td> <td>2</td> </tr> <tr> <td>Possible</td> <td></td> <td>6</td> <td></td> <td>10</td> <td></td> <td>16</td> </tr> <tr> <td>Unlikely</td> <td>1</td> <td>13</td> <td>4</td> <td>14</td> <td>3</td> <td>35</td> </tr> <tr> <td>Total</td> <td>1</td> <td>20</td> <td>4</td> <td>24</td> <td>4</td> <td>53</td> </tr> </tbody> </table> <p>Out of the 53 taxa identified from the desktop search, only one was considered likely to occur, and 15 were considered possible to occur.</p> <p>The survey recorded 137 flora taxa from 34 families. These included 134 native taxa and three introduced taxa (weeds). The most species-rich families recorded were the Fabaceae (wattles and peas) with 31 taxa, Malvaceae with 19 taxa, and Poaceae (grasses) with 16 taxa.</p> <p>No conservation significant flora taxa were recorded.</p>	Likelihood	Conservation Significance					Total	Endangered	Priority 1	Priority 2	Priority 3	Priority 4	Likely		1			1	2	Possible		6		10		16	Unlikely	1	13	4	14	3	35	Total	1	20	4	24	4	53
Likelihood	Conservation Significance					Total																																			
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Possible		6		10		16																																			
Unlikely	1	13	4	14	3	35																																			
Total	1	20	4	24	4	53																																			
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.																																								

<b>Principle (d)</b> 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											
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>Woodman Environmental (2019a) Detailed Flora and Vegetation Survey (formally Level 2)</li> </ul>										
<b>Assessment</b>	<p>No TECs, listed under the EPBC Act or BC Act are found within the application area. The search of the Commonwealth Protected Matters database with regard to MNES listed under the EPBC Act did not return any TECs as likely or known to occur within the application area (AWE 2020).</p> <p>No DBCA listed PECs are found within the application area. Search results of the DBCA Threatened and Priority Ecological Communities (TEC-PEC) database did not yield any known TEC or PEC within the area boundaries, nor within 50 kilometres of the application area.</p> <p>Five vegetation types were recorded within the application area, none of which were considered to be of regional significance.</p> <p>The proposed clearing is not expected to result in a significant impact at the local or regional scale due to the relatively small scale of clearing.</p>										
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.										
<b>Principle (e)</b> Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared											
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>Woodman Environmental (2019a) Detailed Flora and Vegetation Survey (formally Level 2)</li> </ul>										
<b>Assessment</b>	<p>The application area is represented by one vegetation association (George Ranges 82) and one land system (Talga) (Van Vreeswyk et al. 2004).</p> <p>The current extent of the George Ranges vegetation association of the application area is summarised below, and has been subject to very limited clearing (less than 1 %) since European settlement.</p> <p><b>Vegetation System Associations Intersecting Fielding’s Gully (Government of WA 2018)</b></p> <table border="1" data-bbox="373 1420 1433 1599"> <thead> <tr> <th>Vegetation System Association</th> <th>Description</th> <th>Current Extent (ha)</th> <th>% of Pre-European Extent Remaining</th> <th>% of Current Extent Protected for Conservation</th> </tr> </thead> <tbody> <tr> <td>George Ranges 82</td> <td>Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i></td> <td>316,855.1 ha</td> <td>99.9 %</td> <td>0 %</td> </tr> </tbody> </table> <p>The proposed clearing footprint occurs within a large contiguous of remnant vegetation. Clearing 40.2 ha within the application area is not a significant impact to the native vegetation of the region .</p>	Vegetation System Association	Description	Current Extent (ha)	% of Pre-European Extent Remaining	% of Current Extent Protected for Conservation	George Ranges 82	Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>	316,855.1 ha	99.9 %	0 %
Vegetation System Association	Description	Current Extent (ha)	% of Pre-European Extent Remaining	% of Current Extent Protected for Conservation							
George Ranges 82	Hummock grasslands, low tree steppe; snappy gum over <i>Triodia wiseana</i>	316,855.1 ha	99.9 %	0 %							
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.										
<b>Principle (f)</b> Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland											
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>Woodman Environmental (2019a) Detailed Flora and Vegetation Survey (formally Level 2)</li> </ul>										

	<ul style="list-style-type: none"> <li>• Groundwater Resource Management (2023) Fielding’s Gully Dewatering Assessment and Pit Lake Closure Water Balance. Prepared for Calidus Resources Ltd.</li> <li>• Groundwater Resource Management (2019a) Hydro-Meteorological and Surface Water Management Study. Warrawoona Gold Project. Pre-Feasibility Study. Prepared for Calidus Resources Ltd.</li> <li>• Groundwater Resource Management (2019b) Warrawoona Gold Project Pre-Feasibility Hydrogeological Investigations Report. Prepared for Calidus Resources Limited.</li> </ul>
<b>Assessment</b>	<p>There are no Nationally Important Wetlands or RAMSAR wetlands located within the application area, with the closest National Important Wetland, the De Grey River, located approximately 70km to the north of the application area (DoEE 2018).</p> <p>There are no permanent pools in the vicinity, with the closest known ephemeral pools located approximately 5 km from the application area.</p> <p>There are some minor ephemeral outwash plains and drainage lines within the application area, running periductular to the proposed access road:</p> <ul style="list-style-type: none"> <li>• Vegetation type D, <i>Eucalyptus victrix</i>, <i>Acacia trachycarpa</i>, <i>Melaleuca linophylla</i> and <i>Atalaya hemiglauca</i> over <i>*Cenchrus ciliaris</i> in drainage channels with open stony creek bed (and corresponds with the ‘Medium Drainage’ habitat type), is within only 0.1 ha of the proposed disturbance footprint.</li> <li>• Vegetation type E, <i>Corymbia hamersleyana</i> over <i>Acacia acradenia</i> tall shrubland over mixed shrubs over <i>Chrysopogon fallax</i> and <i>*Cenchrus ciliaris</i> on diffuse drainage channels (and corresponds with the ‘Minor Drainage’ habitat type), is within only 1.4 ha of the proposed disturbance footprint.</li> </ul> <p>The survey recorded five taxa of facultative phreatophytes, all within vegetation type D which comprised the wider drainage channels of the survey area. Since these taxa are all facultative phreatophytes, vegetation type D does not appear to be groundwater dependent.</p> <p>The main phreatophytic taxa in the Pilbara are <i>Melaleuca argentea</i> and <i>Sesbania formosa</i> (Woodman 2020b), neither of which were recorded from Fielding’s Gully, during the current survey, nor during a reconnaissance visit by Rapallo in 2020 (unpublished data), nor by Woodman (2020b) as part of the Warrawoona flora survey.</p> <p>The Bureau of Meteorology (2024) Groundwater Dependent Ecosystems Atlas mapped the Fielding’s Gully survey area as Low potential GDE. A recent groundwater study was completed at for the Warrawoona project by Groundwater Resource Management (GRM 2023), including five resource holes at Fielding’s Gully. Measurements of water level showed that the groundwater at Fielding’s Gully sits between 19.4 to 27.2 metres below ground level.</p> <p>This result further indicates that it is very unlikely that local Eucalypts and Melaleucas of the area are groundwater dependent, given that groundwater needed to be within 10 metres of the surface, for vegetation to be depended on groundwater (Woodman 2020b).</p>
<b>Outcome</b>	The proposed clearing is unlikely to be at variance with this Principle.
<b>Principle (g)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation</b>
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>• Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>• Mine Earth (2019) Warrawoona Gold Project: Soils and landform assessment.</li> <li>• Groundwater Resource Management (2019a) Hydro-Meteorological and Surface Water Management Study. Warrawoona Gold Project. Pre-Feasibility Study. Prepared for Calidus Resources Ltd.</li> </ul>

<b>Assessment</b>	<p>The proposed clearing footprint is unlikely to give rise to soil erosion, waterlogging or flooding. The application area is generally underlain by highly permeable sandy loams and sandy clay loams. Water infiltration in this area is typically very effective and efficient with no evidence of flooding (and erosion).</p> <p>Soils of the area may have a risk of wind erosion following clearing; however this will be managed by ensuring that clearing is undertaken immediately prior to the commencement of construction. Any potential dust issues following clearing and construction will also be managed in best practice management where required.</p> <p>Clearing is not likely to cause land degradation due to:</p> <ul style="list-style-type: none"> <li>• the small area of clearing</li> <li>• the large extent of vegetation remaining within the local and regional areas</li> <li>• cleared areas will either be stabilised through immediate development or rehabilitation.</li> <li>• the implementation of best practice engineering to stabilise the road and manage surface water flow into and from the surrounding environment.</li> </ul>
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.
<b>Principle (h)</b>	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
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>• Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> </ul>
<b>Assessment</b>	<p>The application area is not situated within, or in close proximity to any Nature Reserves, Nationally Important Wetlands, Environmentally Sensitive Areas, or other protected areas. The nearest DBCA legislated lands include:</p> <ul style="list-style-type: none"> <li>• Mungaroon Range Nature Reserve, 150km west of the application area</li> <li>• Karijini National Park, 160km south west of application area</li> <li>• Karlamilyi National Park, 200km south east of the application area</li> </ul> <p>The activities associated with Fielding’s Gully will only impact the vegetation within the clearing footprint and is unlikely to impact the conservation value of regional conservation areas, with the spread of weeds to such areas from poor vehicle hygiene the only possible (albeit very unlikely) threat.</p> <p>Best practice management will be implemented (including but not limited to vehicle hygiene) to ensure the risk of spread of weeds from the application area is further reduced during clearing works and operations.</p>
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.
<b>Principle (i)</b>	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
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>• Rapallo Environmental (2024). Detailed flora survey and basic fauna survey of Fielding Gully. Prepared for Calidus Resources Limited. May 2024.</li> <li>• Woodman Environmental (2019a) Detailed Flora and Vegetation Survey (formally Level 2)</li> <li>• Groundwater Resource Management (2019a) Hydro-Meteorological and Surface Water Management Study. Warrawoona Gold Project. Pre-Feasibility Study. Prepared for Calidus Resources Ltd.</li> </ul>

	<ul style="list-style-type: none"> <li>Groundwater Resource Management (2019b) Warrawoona Gold Project Pre-Feasibility Hydrogeological Investigations Report. Prepared for Calidus Resources Limited.</li> </ul>
<b>Assessment</b>	<p><b>Surface water</b></p> <p>The application area is located centrally within the Coongan River catchment, which itself is situated centrally within the much larger De Grey basin catchment. Based on soil, habitat and vegetation mapping within the application area, approximately 1.5 ha of the footprint (15.4 ha within the application area) is represented by either minor or medium drainage lines or outwash plains, within the 7,080km<sup>2</sup> Coongan River Catchment.</p> <p>No permanent pools are evident within the local catchments, and no permanent pools have been located within the application area or the broader Warrawoona Gold Project area, despite searches during extensive flora and fauna surveys and discussions with local pastoralists/land managers. Some ephemeral pools develop in creek beds following rain; however, these are not permanent and are not found in the vicinity of the application area. The closest known ephemeral pools are located between 5 and 15km from the application area.</p> <p>Given the relatively small clearing area (40.2ha), the limited surface water features in the disturbance footprint (1.5 ha) of the application area and the considerable distance from nearby surface water features and wetlands (70km), it is not likely the clearing would cause deterioration in the quality of surface water.</p> <p><b>Groundwater</b></p> <p>The groundwater quality in the area is fresh to slightly brackish, and slightly alkaline. Dissolved metals concentrations in the groundwater were generally low, apart from arsenic and iron (GRM 2023)</p> <p>The results show that the groundwater at Fielding’s Gully is fresh, neutral to slightly alkaline and of the sodium chloride type with a high hardness. All dissolved metals results were within the ADWG limits for potable water quality except for arsenic. The arsenic concentration in the four groundwater samples ranged from 17 to 60ug/L, which exceeded the potable limit guideline for arsenic (10 ug/L). The presence of arsenic in the local groundwater in low levels is considered to be naturally occurring, with baseline concentrations of arsenic in the groundwater around Warrawoona found in previous investigations at Copenhagen and Klondyke (GRM 2023, GRM 2019b).</p> <p>A Groundwater Monitoring Procedure (CRL-ENV-PRO-021-19), will be implemented and will incorporate groundwater levels and water quality monitoring.</p> <p>Groundwater will be monitored and managed in accordance with RIWI Act licence conditions as well as internal groundwater monitoring procedures.</p> <p>It is not likely that vegetation clearing would cause deterioration in the quality of groundwater.</p>
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.
<b>Principle (j)</b>	<b>Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding</b>
<b>Supporting Studies</b>	<ul style="list-style-type: none"> <li>Woodman Environmental (2019a) Detailed Flora and Vegetation Survey (formally Level 2).</li> <li>Groundwater Resource Management (2019a) Hydro-Meteorological and Surface Water Management Study. Warrawoona Gold Project. Pre-Feasibility Study. Prepared for Calidus Resources Ltd.</li> <li>Groundwater Resource Management (2019b) Warrawoona Gold Project Pre-Feasibility Hydrogeological Investigations Report. Prepared for Calidus Resources Limited.</li> </ul>
<b>Assessment</b>	The climate of the Pilbara region is highly variable, both spatially and temporally, with droughts and floods known to occur in the same area within short periods of time



	<p>Although situated in a semi-arid region with mean annual rainfalls in the order of 360 mm, significant short duration rainfall events can occur during the summer months when Tropical cyclones and related low-pressure systems cross the Pilbara coast, which can deliver daily rainfall totals in excess of 330 mm locally.</p> <p>Tropical cyclones bring heavy rains to the Pilbara region and although erratic in nature, occur relatively frequently and are therefore considered in the design of infrastructure and surface water management measures.</p> <p>There are several relatively minor ephemeral watercourses, outwash plains and drainage lines that cross the application area, which align in a roughly northeast to southwest direction.</p> <p>The application area is located within the Coongan River Catchment (7,080km<sup>2</sup>). The total area of disturbance (40.2 ha) within the application area (254.2 ha), which represents 0.005% and 0.04% of the total Coongan River Catchment area respectively.</p> <p>Furthermore, based on soil, habitat and vegetation mapping within the application area, approximately 1.5ha of the disturbance footprint is represented by either minor or medium drainage lines or outwash plains, within the 7,080km<sup>2</sup> Coongan River Catchment.</p> <p>Given that the application area is in the upper catchment, the area upstream of the application area is very limited and impacts on the hydrological regime downstream are expected to be negligible.</p>
<b>Outcome</b>	The proposed clearing is not at variance with this Principle.

# 5 RISK ASSESSMENT

## 5.1 APPROACH

A risk assessment of the application area has been undertaken of the potential environmental impacts within the application area. The risk assessment approach is based on guidance developed by the Department of Environment Regulation’s (DER) *Risk Assessments Part V Division 3 EP Act (DER 2017)*, which uses a consequence and likelihood rating system to determine the most appropriate risk rating for each impact. Details of the risk assessment approach are discussed below.

### 5.1.1 Consequence

Consequence refers to an environmental outcome or impact arising from a risk event occurring. An assessment of consequence will indicate the seriousness of a risk event, which may be expressed in terms of environmental implications (Table 10).

**Table 10 Consequence Risk Criteria**

Consequence levels	Potential consequences/impacts
Severe	<ul style="list-style-type: none"> <li>on-site impacts: catastrophic</li> <li>off-site impacts local scale: high level or above</li> <li>off-site impacts wider scale: mid-level or above</li> <li>Mid to long term or permanent impact to an area of high conservation value or special significance</li> <li>Specific Consequence Criteria (for environment) are significantly exceeded</li> </ul>
Major	<ul style="list-style-type: none"> <li>on-site impacts: high level</li> <li>off-site impacts local scale: mid-level</li> <li>off-site impacts wider scale: low level</li> <li>Short term impact to an area of high conservation value or special significance<sup>^</sup></li> <li>Specific Consequence Criteria (for environment) are exceeded</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>on-site impacts: mid-level</li> <li>off-site impacts local scale: low level</li> <li>off-site impacts wider scale: minimal</li> <li>Specific Consequence Criteria (for environment) are at risk of not being met</li> </ul>
Minor	<ul style="list-style-type: none"> <li>on-site impacts: low level</li> <li>off-site impacts local scale: minimal</li> <li>off-site impacts wider scale: not detectable</li> <li>Specific Consequence Criteria (for environment) likely to be met</li> </ul>
Slight	<ul style="list-style-type: none"> <li>on-site impact: minimal</li> <li>Specific Consequence Criteria (for environment) met</li> </ul>

Source: DER (2017)

### 5.1.2 Likelihood

Likelihood refers to the probability of an environmental risk event occurring. Risks that have a higher likelihood (i.e. frequent occurrences) have a greater chance of an environmental impact occurring (Table 11).

**Table 11 Likelihood rankings**

Likelihood levels	Frequency of risk events
Almost certain	The risk event is expected to occur in most circumstances
Likely	The risk event will probably occur in most circumstances
Possible	The risk event could occur at some time
Unlikely	The risk event will probably not occur in most circumstances
Rare	The risk event may only occur in exceptional circumstances

Source: DER (2017)

### 5.1.3 Risk rating determination

The risk rating is determined for a particular risk by combining the consequence level with the likelihood level (Table 12). The results of the risk evaluation process are summarised in a risk matrix table (Table 12), noting that the main feature is to divide the matrix table into four ratings of risk classifications are:

- Extreme risks: Unacceptable. Risk event will not be tolerated. DER may refuse application
- High risks: May be acceptable. Subject to multiple regulatory controls. Risk event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
- Medium risk: Acceptable, generally subject to regulatory controls. Risk event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
- Low risk: Acceptable, generally not controlled. Risk event is acceptable and will generally not be subject to regulatory controls.

**Table 12 Risk rating matrix**

		Consequence				
		Slight	Minor	Moderate	Major	Severe
Likelihood	Almost certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	Extreme
	Unlikely	Low	Medium	Medium	Medium	High
	Rare	Low	Low	Medium	Medium	High

Source: DER (2017)

## 5.2 POTENTIAL IMPACTS

Potential environmental impacts have been identified based on the proposed activities at Fielding’s Gully and the potential environmental factors that may be at risk from these activities. Potential direct and indirect impacts for each relevant environmental factor is summarised in Table 13.

**Table 13 Potential impacts**

Impact type	Potential Impact	Description/ causing factor
<b>Terrestrial Fauna</b>		
Direct	Habitat loss	Direct loss of fauna habitat due to land clearing

Impact type	Potential Impact	Description/ causing factor
Indirect	Habitat fragmentation	Habitat fragmentation from the establishment of infrastructure such as roads and utility corridors can restrict animal movements.
	Death or injury to individuals	Death or injury to individuals as a result of interactions with vehicles, infrastructure, machinery and the workforce.
	Reduced habitat quality	Habitat modification and reduced habitat quality resulting from an increase in weeds may degrade the condition and resilience of local vegetation.
	Increased predation and competition	Increased predation and competition from introduced species as a result of new road corridors, and generation of food/water resources.
	Altered behaviour	Altered behaviour of native populations and/or individuals may occur as a result of dust emissions, artificial light or water storage facilities
	Altered fire regimes	Altered fire regimes (e.g. increased frequency, intensity, extent) through uncontrolled or unintentional fires as a result of increased human activity in the area, has the potential to modify, degrade or remove fauna habitat or individuals.
<b>Flora and vegetation</b>		
Direct impacts	Loss of native flora.	Direct loss of conservation significant native flora.
	Vegetation removal	Direct loss of conservation significant vegetation or ecological communities
Indirect impacts	Downstream disturbance	Downstream disturbance/impact to wetlands and/or watercourses
	Reduction in remnant extent	Reduction in overall remnant vegetation extent
	Land degradation	Land degradation and reduction in environmental value of the local area
<b>Inland waters</b>		
Indirect	Loss of catchment area	Loss of catchment area
	Altered water flow	Altered surface water flow downstream
	Contamination	Groundwater and surface water contamination

### 5.3 RISK ASSESSMENT AND RATING

Overall, the risk assessment process identified 15 potential impacts, one of which rated as a “High”, 13 rated as Medium and one rated as Low (Table 14). No extreme risks were identified.

The “High” risk rating was given for the direct loss of habitat associated with conservation significant fauna. This was rated High because the application area will remove approximately 11ha of high significance Sandplain habitat, which is known to support Brush-tailed Mulgara, and potentially Night Parrot and Greater Bilby (not confirmed from site). The consequence was ranked as “Minor”, given that the Sandplain habitat is widespread in the local and regional area, with just 8.1% of locally mapped Sandplain habitat to be disturbed, however the likelihood is “Almost Certain”, which elevates the overall risk rating. Given the consequence of this impact (Minor), this impact is considered acceptable, subject to regulatory controls.

The remaining risks, ranked from Low to Medium, are all considered acceptable, with some level of regulatory control depending on the potential impact.



**Table 14 Risk assessment and rating**

Ref	Potential Impact	Assessment, mitigation and comments	Consequence	Likelihood	Risk rating
<b>Terrestrial Fauna</b>					
1	Direct loss of habitat for conservation significant fauna species	<p>Approximately 1.5 ha of moderate significance habitat, including:</p> <ul style="list-style-type: none"> <li>• Medium Drainage line (dispersal and foraging habitat for the Northern Quoll, Pilbara Olive Python, Ghost Bat, and Pilbara Leaf-nosed Bat. Represents 0.1 ha of the disturbance footprint.</li> <li>• Minor Drainage line (dispersal and foraging habitat for the Northern Quoll, Pilbara Olive Python, Ghost Bat, and Pilbara Leaf-nosed Bat. Represents 1.4 ha (of the disturbance footprint.</li> </ul>	Minor	Almost certain	High
2	Habitat fragmentation from the establishment of infrastructure such as roads and utility corridors can restrict animal movements.	<p>Fielding’s Gully plans to establish approximately 5 km of road and utility corridor, the majority of which is within the moderate value hillcrest and stony plains habitat types (87.5%). A 5 km road corridor is a very minor disturbance footprint, particularly for the Pilbara region</p> <p>Most species assessed are known to cross roads and corridors to access habitat.</p> <p>Road corridor does not intersect or lie between core habitat, such as gorges and rocky ridge, and so movement between habitats on either side of the corridor may be limited.</p>	Minor	Possible	Medium
3	Death or injury to individuals as a result of interactions with vehicles, infrastructure, machinery and the workforce.	<p>Construction activities will occur during daylight hours and vehicle movement on access roads at night will be limited.</p> <p>Many of the species assessed are known to be comfortable crossing roads and corridors. Some species are more susceptible (i.e. Pilbara Olive Python is known to lay still in response to vehicle vibration) than others (i.e. small rodents).</p> <p>Individual deaths can affect some very small local populations (i.e. Bilby – although not confirmed from local surveys it may potentially occur), however other species have high fecundity and boom-bust life modes and can easily recover from individual deaths (i.e. Western Pebble-mound Mouse).</p> <p>The road corridor does not intersect (or lie between) core habitat for conservation significant species and so movement between habitats and via road crossings may be limited.</p> <p>Speed restrictions and hours of operation will apply. Site personnel will be made aware of this issue through inductions and fauna management procedures.</p>	Moderate	Possible	Medium
4	Habitat modification and reduced habitat quality resulting from	Cleared areas will not be left undeveloped for long periods, rather, areas will be developed (road or camp construction) soon after clearing.	Minor	Unlikely	Medium

Ref	Potential Impact	Assessment, mitigation and comments	Consequence	Likelihood	Risk rating
	an increase in weeds may degrade the condition and resilience of local vegetation.	Botanic surveys conducted in the project area by Rapallo Environmental (2023) and locally by Woodman Environmental (2019a and 2019b), found no introduced taxa listed as Weeds of National Significance (as listed under AWC 2019), with one Declared Pest ( <i>Calotropis procera</i> ) (as listed under DPIRD 2019) and two other (Permitted s11, BAM Act) introduced taxa. Hygiene management and weed control procedures will be implemented			
5	Increased predation and competition from introduced species as a result of new road corridors, and generation of food/water resources.	Feral predators have already been recorded on site, in part due to existing (historic) mining tracks and disturbance workings across the local area. Site personnel will be made aware of feral animals and be required to avoid and report any interactions via inductions and fauna management procedures. Feral animal control measures will be implemented opportunistically.	Moderate	Possible	Medium
6	Altered behaviour of native populations and/or individuals may occur as a result of dust emissions, artificial light or water/waste storage facilities	Some native animals are known to reside in infrastructure if resources (i.e. water, waste food, shelter etc) are available to them. Dust impacts will be limited as small clearing areas will be developed immediately and dust management procedures will be implemented. Light design will consider light impacts towards the Warrawoona Range (for potential light impacts on bats). Limited activities will occur during night hours and so prolonged and intense lighting will not be required. Site personnel will be made aware of animal interaction issues via fauna management procedures and inductions.	Minor	Possible	Medium
7	Altered fire regimes through uncontrolled or unintentional fires as a result of increased human activity.	Fire is a regular occurrence in the Pilbara, predominantly as a result planned controlled burning activities or unplanned events such as lightning storms. Site personnel will be inducted in fire management procedures to prevent fires from starting within the application area and to control and contain unplanned and unintentional fires in and around the application area to avoid fire spread.	Moderate	Unlikely	Medium
<b>Vegetation and Flora</b>					
8	Direct loss of conservation	No Threatened or Priority flora, listed under the EPBC Act or BC Act, will be impacted in the application area	Minor	Likely	Medium

Ref	Potential Impact	Assessment, mitigation and comments	Consequence	Likelihood	Risk rating
	significant native flora.				
9	Direct loss of conservation significant vegetation or ecological communities	<p>The proposed clearing footprint comprises approximately 40.2 ha of native vegetation.</p> <p>No State or Commonwealth listed Threatened Ecological Communities (TECs) occur within the Fielding's Gully area.</p> <p>No DBCA listed priority Ecological Communities (PECs) were inferred locally by Rapallo Environmental (2023) or more broadly by Woodman Environmental (2019a and 2019b).</p> <p>Five vegetation types occur within the applications area, all of which are widespread throughout the Pilbara region. A description and the area (ha) of each vegetation type within the application area is summarised below (note, there is a small portion previously cleared vegetation (3.4 ha) within the application area).</p>	Minor	Likely	Medium
10	Downstream disturbance/impact to wetlands and/or watercourses	<p>There are no Nationally Important Wetlands or RAMSAR wetlands located within the application area, with the closest National Important Wetland, the De Grey River, located approximately 70km to the north of the application area (DoEE 2018).</p> <p>There are no permanent pools in the vicinity, with the closest ephemeral pools located over 5km from the application area.</p> <p>There are some minor ephemeral outwash plains and drainage lines within the application area, running periductular to the proposed access road.</p>	Moderate	Unlikely	Medium
11	Reduction in overall remnant vegetation extent	<p>Disturbance will occur over a very small footprint (~40ha).</p> <p>The proposed clearing footprint occurs within a large contiguous of remnant vegetation.</p> <p>The application is represented by one vegetation association (George Ranges 82), which occurs over very large area of the Pilbara (317,396 ha) and has been subject to very limited clearing (less than 1 %) since European settlement.</p>	Moderate	Unlikely	Medium
12	Land degradation and reduction in environmental value of the local area	<p>Cleared areas will not be left undeveloped for long, rather, areas will be developed (road or camp construction) soon after clearing.</p> <p>Dust management and topsoil stockpile management procedures will be implemented.</p> <p>Infrastructure will be engineered to manage surface water flows and consider and implement water erosion measures in all surface water design.</p> <p>Botanic surveys found no introduced taxa listed as Weeds of National Significance (as listed under AWC 2019), and only one Declared Pest (<i>Calotropis procera</i>) (as listed under DPIRD 2019).</p>	Minor	Unlikely	Medium

Ref	Potential Impact	Assessment, mitigation and comments	Consequence	Likelihood	Risk rating
		Hygiene management and weed control procedures will be implemented			
<b>Inland Waters</b>					
13	Loss of catchment area	<p>The majority of activity is located within the Camel Creek Catchment, which in turn is located within the broader Coongan River Catchment (7,080km<sup>2</sup>).</p> <p>Based on soil, habitat and vegetation mapping within the application area, approximately 1.5ha of the disturbance footprint is represented by either minor or medium drainage lines or outwash plains, within the 7,080km<sup>2</sup> Coongan River Catchment.</p>	Slight	Possible	Low
14	Altered surface water flow downstream	<p>The road corridor crosses over a number of outwash plains and minor drainage lines, but the camp footprint is positioned to avoid any of these surface water flow features.</p> <p>Fielding's Gully is primarily located within the Camel Creek Catchment, which in turn is located within the broader Coongan River Catchment (7,080km<sup>2</sup>).</p> <p>Tropical cyclones in the Pilbara occur relatively frequently and are therefore considered in the design of infrastructure and surface water management measures throughout all developments in the region.</p> <p>Calidus will implement best practice road engineering design that considers surface water flow under tropical rainfall and flooding events.</p>	Minor	Unlikely	Medium
15	Groundwater and surface water contamination	Best practice Hydrocarbon management and handling procedures will be implemented.	Minor	Unlikely	Medium



## 6 ENVIRONMENTAL MANAGEMENT

### 6.1 MANAGEMENT APPROACH

Calidus has commenced development of a series of procedures to help manage and mitigate potential impacts from the broader Warrawoona Gold Project. Procedures most relevant to managing impacts resulting from the proposed Fielding’s Gully project are summarised in Table 15 and key actions from these procedures is further provided in the following section (Section 6.2, Key Management Actions).

**Table 15 Key environmental management documentation relevant to terrestrial fauna**

Environmental Management Document	Calidus Reference
Environmental Management	
Environmental Management Standard	CRL-ENV-STA-001-19
Fauna Management	
Significant Species Management Plan	CRL-ENV-PLN-006-19
Fauna Management Procedure	CRL-ENV-PRO-007-19
Introduced Fauna Control Procedure	CRL-ENV-PRO-009-19
Ground Disturbance Permit Procedure	CRL-ENV-PRO-002-19
Water Management	
Surface Water Monitoring Procedure	CRL-ENV-PRO-020-19
Groundwater Monitoring Procedure	CRL-ENV-PRO-021-19

### 6.2 KEY MANAGEMENT ACTIONS

#### 6.2.1 Avoid harm to individuals through fauna protection measures

- Include fauna protection specifications in all construction related contracts and sub-contracts, including no barbed wire fencing at the project area and measures to prevent accidental entrapment of fauna such as the Northern Quoll
- Induct workforce on fauna identification and encounter (including physical interaction, littering, feeding, approaching and unexpected encounters) and educate the mine site personnel about the fauna of conservation significance within the project area.
- During construction, any trenches that remain open overnight must follow trench management procedures, including a provision for ramps to assist trapped fauna and to relocate trapped fauna unable to escape (using trained fauna handlers).

#### 6.2.2 Adaptive monitoring and management measures

- Implement the Significant Species Management Plan (CRL-ENV-PLN-006-19), which contains specific management and monitoring targets for fauna of conservation significance, to be reviewed on a regular basis. Key monitoring components of the Significant Species Management Plan include:
  - Significant bats. Bat monitoring will include: 1) prior to project implementation, ongoing surveys at significant roosts; 2) prior to project implementation, bat activity at the existing Copenhagen mine pit lake across all seasons; 3) during operations, monitoring bat activity at impact and non-impact (control) sites, including the mining exclusion zone; 4) during operations, activity levels near night infrastructure (i.e. plant

site), as well as bat activity during key project development milestones (e.g. blasting for the first time, blasting at significantly closer locations, first outflow of TSF or when pooling starts etc).

- Other conservation significant species (Northern Quoll, Pilbara Olive Python, Bilby). Monitoring will include pre clearance surveys for key species using approved DBCA methodology, targeted surveys of suitable habitat adjacent the mine areas and monitor population changes over time.
- Monitor groundwater levels and quality and adjust modelling accordingly.

### **6.2.3 Measures to reduce impacts from habitat removal, fragmentation and modification**

- Implement Ground Disturbance Permitting Procedure (CRL-ENV-PRO-002-19) to ensure disturbance remains within authorised boundaries.
- Prevent unauthorised access to habitats of conservation significance, including the mining exclusion zone.
- Develop and implement rehabilitation and mine closure principles and procedures that include aims to rehabilitate self-sustaining fauna habitat.
- Maintain natural drainage flows where practicable and prevent ponding of water.

### **6.2.4 Measures to reduce impacts from light and general operational noise/vibration**

- During both construction and operation stages, design artificial lighting to illuminate work areas and limit illumination of the surrounding landscape, such as water sources and substantial rocky outcrops. Directing lights inwards towards work activities will minimise lighting effects on fauna in adjacent areas.
- Implement best available technology to minimise noise emissions from mining operations.
- Reduce traffic and equipment usage at night to minimise noise disruption.
- Mine and infrastructure planning has considered the location and position of the accommodation village, to minimise artificial lighting of the bat roost entrances.

### **6.2.5 Measures to reduce impacts from vehicle strike**

- Investigate strategies to reduce impacts on fauna from all construction traffic, especially for nocturnal species or those prone to vehicle collisions, including speed limits, signage, fences or barriers.
- Prevent unauthorised off-track driving.
- Report and record any incident that results in the injury or death of a fauna species from vehicle strike.

### **6.2.6 Measures to reduce impacts from introduced species**

- Conduct opportunistic monitoring and control of feral animals and implement measures to reduce the abundance of feral species in the project area
- Employ housekeeping measures such as covering up landfill and bin management.
- Implement quarantine and hygiene controls to prevent the inadvertent introduction of Cane Toads and other introduced species (including weeds).

### **6.2.7 Measures to reduce impacts from dust**

- Prepare and implement dust management procedures to reduce the effects of dust on nearby vegetation and fauna habitats, including management of vehicle speed on unsealed roads, dust suppression measures (spray trucks) and proximity of habitats to blasting and excavation.
- Implement standard dust suppression measures across Fielding's Gully during construction and operation

### **6.2.8 Measures to reduce impacts from changed fire regimes**

- Prepare and implement best practice fire control strategies to manage unplanned fires, including educating and training staff on equipment and procedures.
- Control and manage weeds as they contribute to an increased fuel load and fire risk.

## 7 CONCLUSION

Baseline studies since 2016 have contributed significantly to the scientific understanding of environmental significance of the broader Warrawoona area and allowed Calidus to design the Fielding's Gully project in a way that identifies, prevents and minimises adverse environmental impacts.

The investigations have relied on the technical skills and experience of over 25 specialised consultants, and covered a range of environmental factors and aspects relevant to the project, including terrestrial and subterranean fauna; flora and vegetation; air quality (dust); noise; vibration/blasting; geotechnical and geochemical analysis of soils and waste; hydrogeology and hydrology; and ethnographic and archaeological investigations.

The results of these investigations, consultations and risk assessments have all been considered in developing the project and the Fielding's Gully project.

As part of an adaptive management approach, Calidus will continue to work closely with technical experts across a range of environmental factors (i.e. bat and other fauna specialists, hydrologists, botanists) to better understand the issues and to refine/adapt management measures accordingly.

By avoiding core habitat for many of the conservation significant species, implementing adaptive management that responds to ongoing monitoring, adopting measures detailed in the management and monitoring procedures developed by Calidus, and through provisions under other (WA State) regulatory mechanisms (such as the EP Act, RIWI Act, *Mining Act 1978* (Mining Act), *Aboriginal Heritage Act 1972* (AH Act)), Calidus is of the view that the Fielding's Gully project can be implemented without material risk the environmental values of the area.

An assessment of the impacts of the Fielding's Gully project against the ten clearing principles has determined that the clearing is not at variance or is unlikely to be at variance with these principles.



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# 9 APPENDICES

## 9.1 APPENDIX 1 – TENEMENT SUMMARY REPORTS

## 9.2 APPENDIX 2 – RAPALLO ENVIRONMENTAL (2024)



## **9.3 APPENDIX 3 – GROUNDWATER RESOURCES MANAGEMENT (GRM) (2023)**