Wirralie Gold Mine

Progressive Rehabilitation and Closure Plan

Solomons Gold Pty Ltd

29 April 2026

Revision: 3.0

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EA holder name	SOLOMONS GOLD PTY LTD
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1.0	5 January 2022	Initial PRCP submission
2.0	15 December 2023	Response to PRCP RFI
3.0	29 April 2026	Response to additional PRCP RFI

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1.0 Introduction

In accordance with the *Environmental Protection Act 1994* (EP Act), all mining activities approved through a site-specific Environmental Authority (EA) application must develop and submit a Progressive Rehabilitation and Closure Plan (PRCP) to the Department of Environment and Science (DES), now known as Department of Environment, Science, Tourism and Innovation (DETSI), for assessment and approval. The main purpose of the PRCP is for the holder of an EA to plan for how and where activities will be carried out on land in a way that maximises progressive rehabilitation to a stable condition (as per section 111A of the EP Act), and, to provide for the condition to which the holder must rehabilitate the land before the EA is surrendered.

This PRCP meets the legislative requirements in sections 126C and 126D of the EP Act and the statutory guideline: Progressive Rehabilitation and Closure Plans (ESR/2019/4964 Version 3.01, 16 SEP 2024).

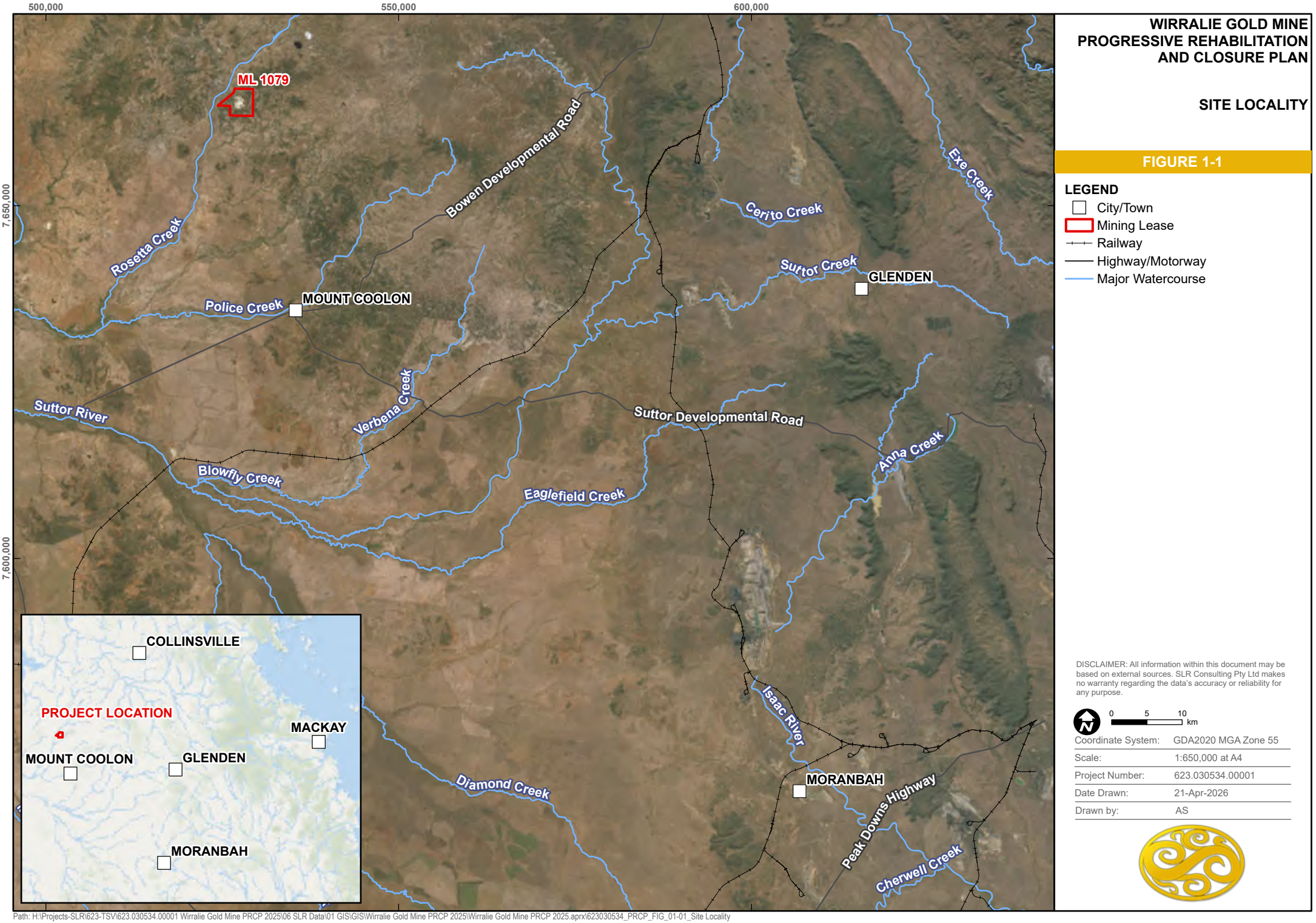
1.1 Project Overview and History

The Wirralie Gold Mine (WGM) is owned and operated by Solomons Gold Pty Ltd (Solomons) and approved under EA EPML00772413 (**Appendix A**). WGM is approximately 210 kilometres (km) south-southeast of Townsville and approximately 30 km north of Mt Coolon (**Figure 1-1**).

Solomons are the current owners of the WGM and operate the mine on mining lease (ML) 1079. The WGM ML1079 was granted in 1986 for exploration activities and further mining which commenced in 1987. The ML1079 has a total surface area of 1,301.04 hectares (ha).

WGM was discovered in 1986 during exploration activities to identify the source to a regional stream sediment sampling anomaly. Mining began at the Project in 1987 and continued until 1993, when the processing plant was relocated to the Yandan mine site, 30 km west. An upgraded 1.5 million tonne per annum treatment plant was reinstated at Wirralie in 1999. The plant treated low-grade oxide and Deep Lead mineralisation until early 2002, when the site was placed in care and maintenance.

Solomons Gold acquired the Project in December 2013 and has since recommenced mining and processing operations.



WIRRALIE GOLD MINE
PROGRESSIVE REHABILITATION AND CLOSURE PLAN

SITE LOCALITY

FIGURE 1-1

LEGEND

- City/Town
- Mining Lease
- Railway
- Highway/Motorway
- Major Watercourse

0 5 10 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:650,000 at A4
Project Number:	623.030534.00001
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1.2 Relevant Legislation and Policies

1.2.1 Mined Land Rehabilitation Policy

The Mined Land Rehabilitation Policy is a joint departmental policy between DESI, the Department of Natural Resources and Mines and Queensland Treasury. The Policy presents Qld Government's position on mine rehabilitation and is the basis of the changes made through the *Mineral and Energy Resources (Financial Provisioning) Act 2018* (MERFP Act).

The Policy states that,

"*land disturbed by mining is considered to be rehabilitated when it can be demonstrated it is safe, stable, does not cause environmental harm, and is able to sustain the post-mining land use (PMLU) approved in the PRCP (referred to as 'stable condition'). An area of land that does not sustain a PMLU (referred to as a 'non-use management area') may be approved if best practice management can be demonstrated, and rehabilitating the area would cause greater environmental risk than not rehabilitating; or the environmental risks from the area are localised, and the cost of rehabilitation would be so excessive as to not be in the public interest.*"

1.2.2 Environmental Protection Act 1994

The amendments to the EP Act requiring mines with site-specific EAs to have a PRCP, came into effect on 1 November 2019. The EP Act states the legislative information requirements for the rehabilitation planning part (section 126C) and PRCP schedule (section 126D). The EP Act also details the assessment process for the approval of a proposed PRCP.

The EP Act contains transitional provisions relating to existing site-specific mines. During the three-year transition period, DETSI will issue notices to existing mines requiring them to develop and submit a proposed PRCP by a specific date (no less than six months from issuing the notice). The transitional provisions also state that existing approvals may be translated into the proposed PRCP without additional assessment or public notification. Any post mining land outcomes identified in a Land Outcome Document (LOD) can be transitioned into the PRCP.

1.2.3 Environmental Protection Regulation 2019

The Environmental Protection Regulation 2019 (EP Regulation) includes PRCP objectives and performance outcomes (schedule 8A) the administering authority must consider when approving a PRCP. The EP Regulation also contains additional requirements for deciding the extent of a floodplain (0.1 % Annual Exceedance Probability (AEP)) of 4th order stream of greater.

1.2.4 PRCP Guideline

The PRCP Guideline (ESR/2019/4964 Version 3.01, 16 September 2024) (is a statutory guideline made under section 550 of the EP Act and includes additional information requirements the administering authority deems necessary or desirable within a PRCP.

The PRCP Guideline provides information about the assessment process for a PRCP, information requirements for the PRCP, relevant post-approval processes and transitional provisions. The PRCP Guideline stipulates the detailed technical information that is expected to be included in a proposed PRCP.

1.2.5 PRCP Application Form

The PRCP must be submitted in accordance with the Application Form: *Submission of a Progressive Rehabilitation and Closure Plan* (ESR/2019/4957 Version 4.05, 03 July 2025). This PRCP has been submitted in accordance with the requirements of the Application Form.

1.2.6 Mineral Resources Act 1989

The *Mineral Resources Act 1989* (MR Act) authorises the undertaking of mining activities with consideration to utilisation of mineral resources and land management. Mining Leases are provisioned under the MR Act and can include conditions holders must comply with.

1.2.7 Other Legislation

Other legislation that is related to the PRC Plan includes:

- *Mineral and Energy Resources Act 2018* (Qld)—outline requirements under Environmental Protection Act 1994 (EP Act) for the progressive rehabilitation and closure of mined land.
- *Vegetation Management Act 1999* (Qld)—regulates and manages the process and impacts of native vegetation clearing. The objectives include conservation of remnant regional ecosystems, prevention of the loss of biodiversity, maintenance of ecological processes, conservation of vegetation in areas of high value or lands vulnerable degradation, and the preservation of high-value regrowth areas.
- *Environmental Offsets Act 2014* (Qld)—establishes a framework for environmental offsets in Queensland to counterbalance any potential significant residual impacts of activities on prescribed environmental matters through the use of environmental offsets.
- *Water Act 2000* (Qld)—provides for delivery of sustainable water planned, allocation management and supply processes to provide for the improved security of water resources in Queensland.
- *Land Act 1994* (Qld)—prescribes the framework for the allocation of non-freehold land tenure and regulates the management of State land in Queensland.
- *Planning Act 2016* (Qld)—this is the overarching policy for land use planning for the State.
- *Aboriginal Cultural Heritage Act 2003* (Qld)—the purpose of the Act is to provide effective recognition, protection and conservation of Aboriginal cultural heritage. This is defined as objects and areas in Queensland that are of particular significance to Aboriginal people because of Aboriginal tradition or history or have evidence of archaeologically or historically significance of occupational.
- *Native Title Act 1993* (Cth)—this establishes a framework for the protection and recognition of native title, including by conferring on Indigenous People who hold (or claim to hold) native title rights and interests in respect of any land or waters. This included the right to be consulted on, and in some cases to participate in, decisions about activities proposed to be undertaken on land (or in waters).
- *Mining and Quarrying Safety and Health Act 1999* (Qld)—regulates the operation of mines to protect the safety and health of persons at mines and persons who may be affected by operations. The Act requires that the risk of injury or illness to any person resulting from operations is at an acceptable level.

2.0 Project Planning

2.1 Project Description

WGM is approximately 210 kilometres (km) south-southeast of Townsville and approximately 30 km north of Mt Coolon (**Figure 1-1**). The region is administered by the Whitsunday Regional Council and is located in a primarily rural zone. The main access route to the Project is via Rutherford Road and the Bowen or Suttor Developmental Roads.

WGM was discovered in 1986 during exploration activities to identify the source to a regional stream sediment sampling anomaly. Mining began at WGM in 1987 and continued until 1993, when the processing plant was relocated to the Yandan mine site, 30 km west. An upgraded 1.5 million tonne per annum (mtpa) treatment plant was reinstated at Wirralie in 1999. The plant treated low-grade oxide and Deep Lead mineralisation until early 2002, when the site was placed in care and maintenance.

Solomons Gold acquired WGM in December 2013 and since recommenced mining and processing operations.

2.1.1 Type of Operations

WGM uses conventional haul truck and excavation operations in an open cut pit (Pit B), supported by traditional drill and blast activities. Mined ore is graded and stored as either low or high grade on the run-of-mine (ROM) pad. Ore is selected and blended prior to entering the crushing circuit. Following primary crushing, the material is screened and either placed on the heap leach or enters the Carbon In Leach (CIL) circuit, depending on the size fraction.

WGM utilises in-pit waste rock disposal to minimise the overall surface disturbance for the Project. Waste material extracted as part of the mining process is currently disposed into Deep Lead Pit. Existing waste rock dumps have previously been rehabilitated with varying success by previous mine operators.

3.1.3. Duration Of Operation

Mining is expected to continue until the oxide resource is depleted, currently anticipated in 2037. A production rate of up to 400,000 tonnes per annum (tpa) is expected whilst future development options are investigated.

The primary mine features and infrastructure is described below:

- Open cut pit areas:
  - Blinky Pit (historical);
  - Pit A;
  - Pit B
  - North Pit; and
  - Deep Lead Pit.
- Overburden dumps and piles:
  - ROM Stockpile;
  - Topsoil Stockpile;
  - Waste Rock Dump (WRD) 1;

  - WRD2;
  - WRD3; and
  - Rehabilitated former WRDs.
- Mine infrastructure areas:
  - Access roads and tracks;
  - Mine haul road;
  - Laydown yards;
  - Processing Plant; and
  - Camps/ administration/former camp;
- Water Storages:
  - Raw water pond; and
  - Run-off dam.
- Tailings Storage Facility (TSF) / Heap Leach Pad; and
- Exploration tracks.

2.2 Mining Tenements

WGM is located on a single mining lease, ML1079, which covers an area of approximately 1,301 ha, as detailed in **Table 2-1**.

Table 2-1 WGM Mining Tenements

Description	ML Details
ML	ML1079
Name	Wirralie
Property	Wirralie Station
Landholder	M and S Meyer
Minerals	BI, CO, CU, MN, NI, PB, SN, W, ZN, AG, AU
Purpose	Mining gold ore and other mining ancillary activities
Area	1,301 ha

2.3 Baseline Information

2.3.1 Climate

Rainfall, Temperature and Evaporation

The nearest Bureau of Meteorology (BoM) weather station is at the Collinsville Post Office (Station ID: 033013), approximately 85 km north-east of WGM. Climate statistics are available from 1939 to 2022 (rainfall) and 1955 to 2022 (temperature) (**Figure 2-1**). The mean maximum temperature for the summer period (December to February) is 33.5°C, and the mean minimum monthly temperature for the same period is 21.7°C. The mean maximum monthly temperature for the winter period (June to August) is 25.7°C, and the mean minimum monthly temperature for the same period is 10.1°C. Mean annual rainfall for Collinsville is 701.9 mm with 83 days of rainfall ≤ 1 mm.

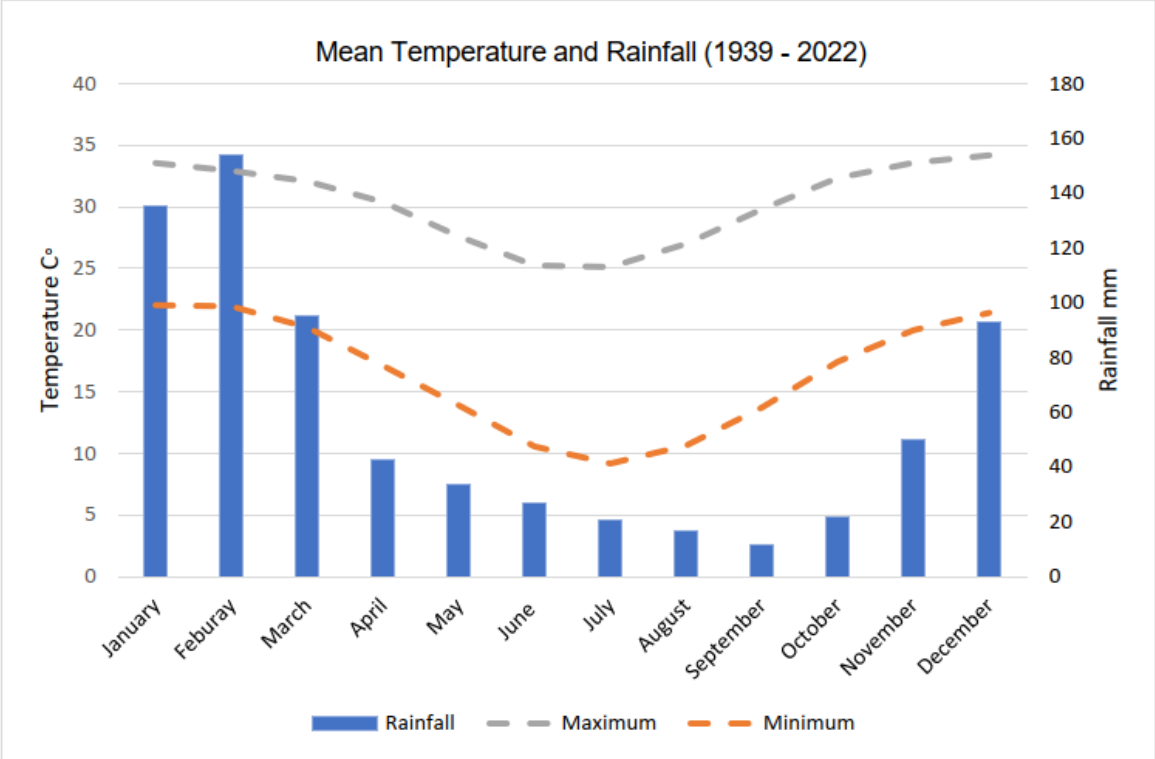


Figure 2-1: Mean temperature and rainfall at Collinsville Post Office (BoM, 2023)

Wind

The region tends to have winds of low velocity (less than 10 km/hr) with the prevailing wind direction predominantly from the east and southeast. Wind rose for the morning (9 am) and afternoon period (3 pm) are displayed in **Figure 2-2** and **Figure 2-3** respectively.

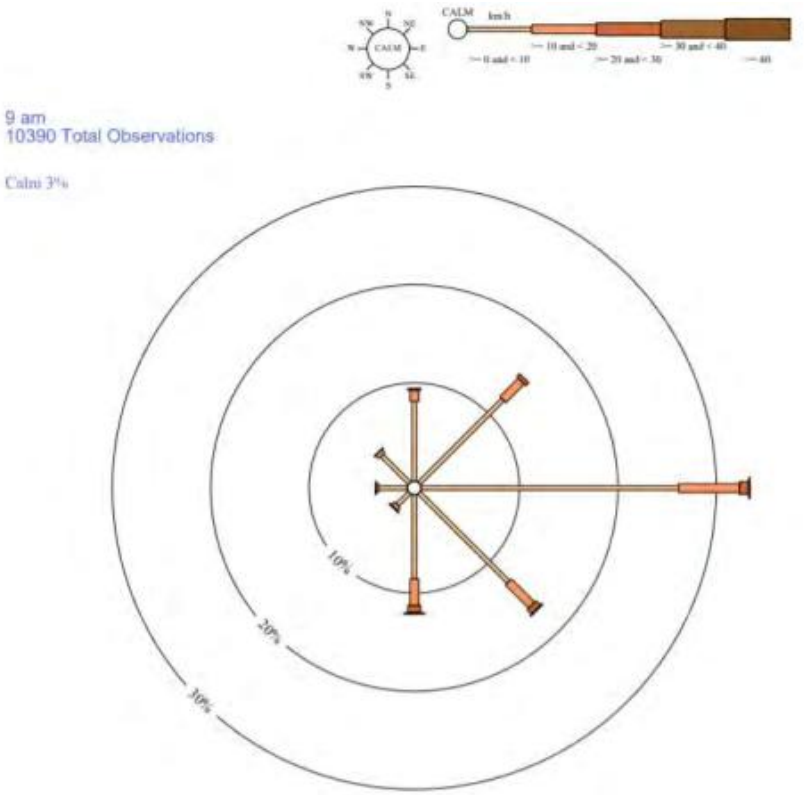


Figure 2-2: Rose of Wind direction versus Wind speed at 9am (034084) (BoM, 2021)

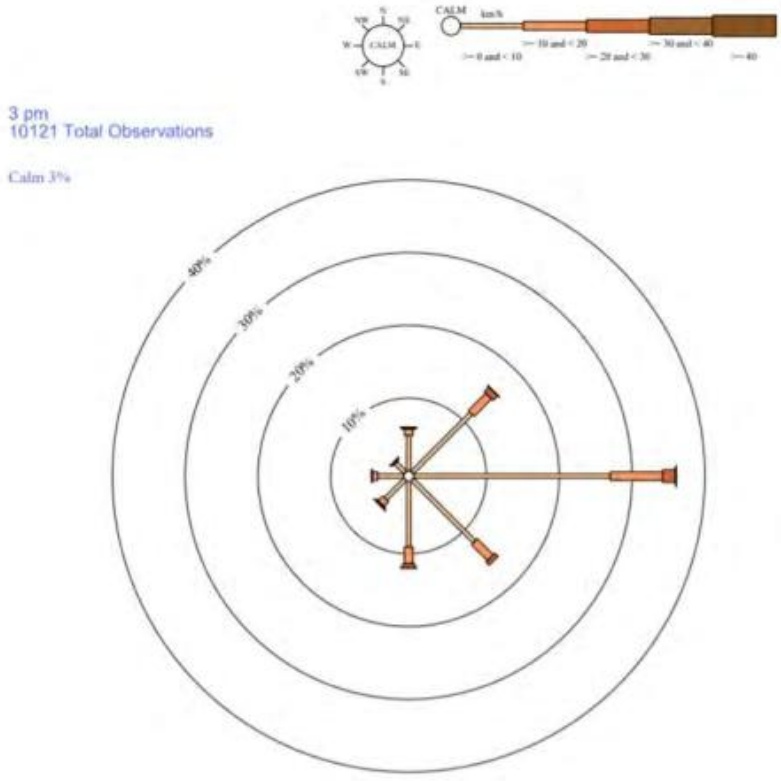


Figure 2-3: Rose of Wind direction versus Wind speed at 3pm (034084) (BoM, 2021)

Long-term Climate Projections

The 2020 State of the Climate Report (Commonwealth Scientific and Industrial Research Organisation and Bureau of Meteorology, 2020) has predicted that air temperature will continue to rise with increased occurrence of extreme heat days. Dry season rainfall is predicted to decline however with an increased likelihood of more intense events across the year. Collectively, these two factors will continue to increase bushfire risk indicated by the change in dangerous fire weather days as illustrated in **Figure 2-4**.

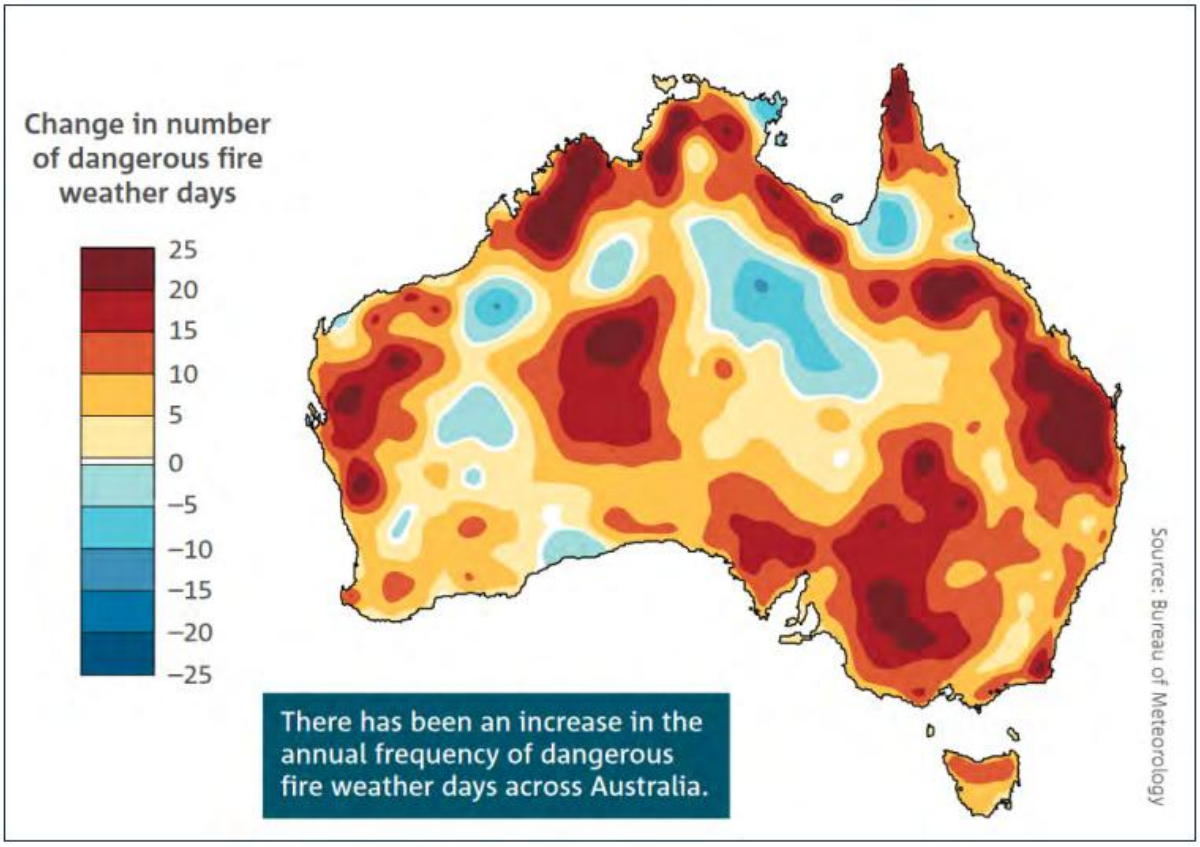


Figure 2-4: Excerpt from the 2020 State of the Climate Report illustrating change in dangerous fire weather days (CSIRO & BOM 2020)

2.3.2 Topography

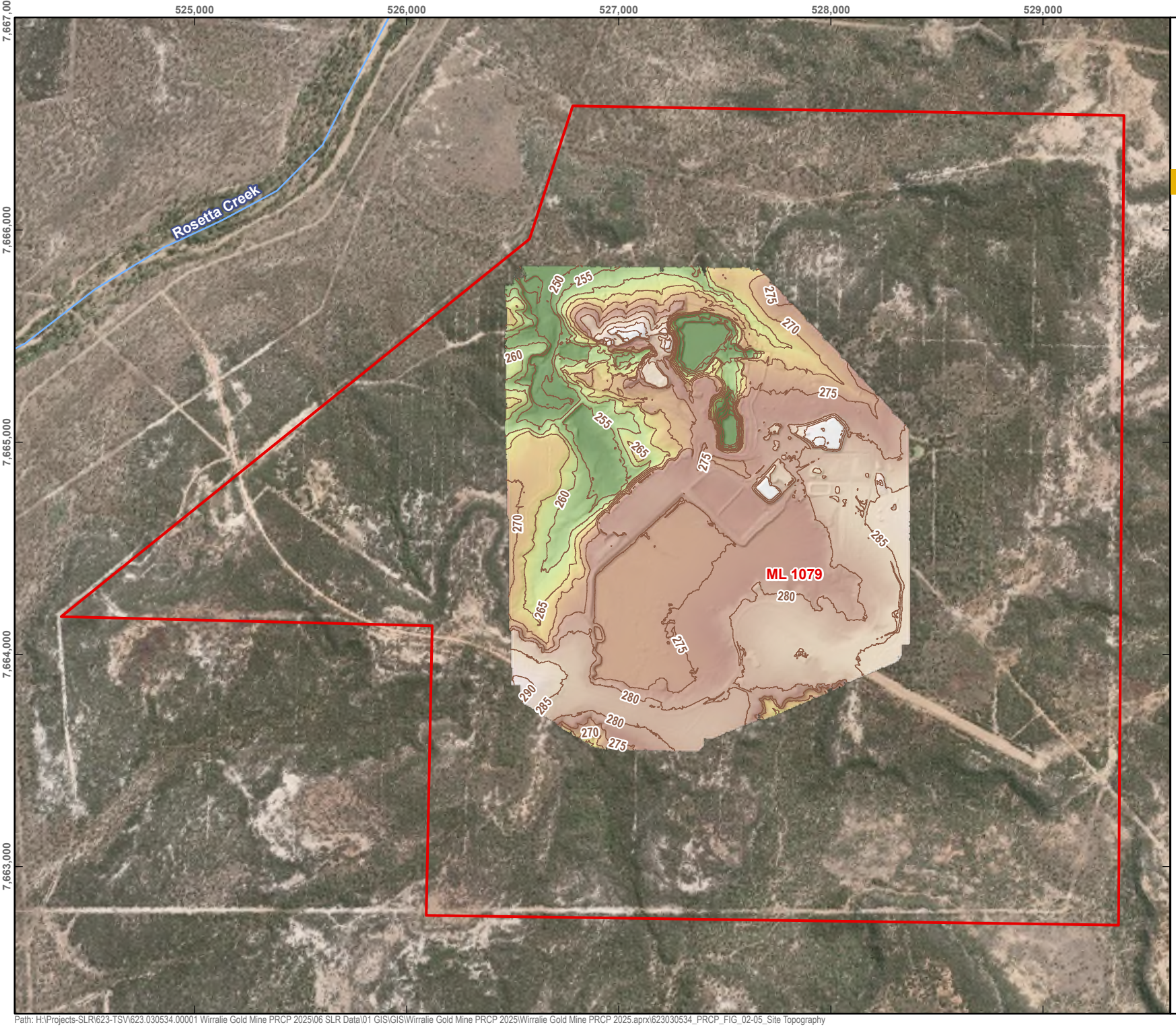
Regionally, WGM lies to the east of the Great Dividing Range and is surrounded by low mountains ranging from 296 mAHD (Rodborough Hill) to 552 mAHD (Mount Landsborough).

At the Project, the topography is variable with rolling rises and hills dominating the site, transitioning to flats and plains (**Figure 2-5**). The highest local features are approximately 290 mAHD transitioning to approximately 260 m AHD north and south of the ML.

WIRRALIE GOLD MINE
PROGRESSIVE REHABILITATION AND CLOSURE PLAN

SITE TOPOGRAPHY

FIGURE 2-5



LEGEND

- Major Watercourse
- Elevation Contour (mAHD)
- Mining Lease

Topography (mAHD)

303

228

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	21-Apr-2026
Drawn by:	AS

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2.3.3 Geology

2.3.3.1 Regional Geology

WGM is regionally situated in the Drummond Basin, a 26,000 km^2 area of central Queensland.

The Drummond Basin is from the Upper Devonian to Lower Carboniferous periods that underwent three cycles (Olgers, 1969). The Project has been historically described as a low-grade, low-sulfidation epithermal system, which lies within cycle one rocks in the central part of the eastern Drummond Basin, and close to the basal unconformity with basement rocks of the Anakie Inlier (NRC, 2016).

2.3.3.2 Structural Geology

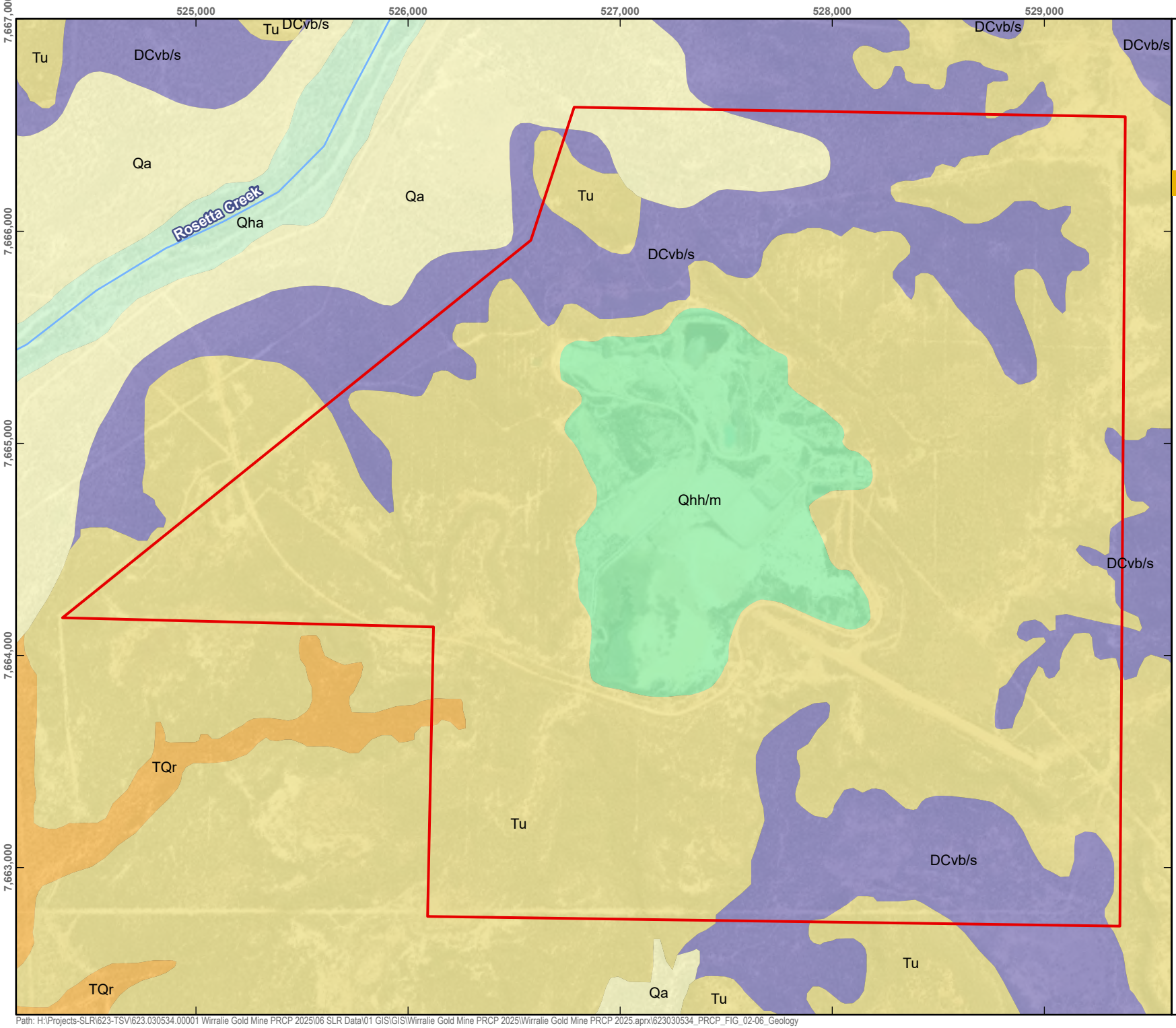
Water bore establishment and publicly available information confirmed that ML1079 surface geology predominately consists of the Suttor Formation, underlain by both the Rosetta Creek and Mt Rankin Formation (Queensland Government, 2021). WGM geology is described below:

- Alluvium (Cz) – Alluvium, soil, sand, lateritic soils and gravels.
- Suttor Formation (Ta) – Quartz Sandstone, conglomerate, sandy claystone, silicified claystone.
- Rosetta Formation - Late Devonian interbedded siltstone to pebbly sandstone and relatively thin rhyolitic ignimbrite sheets.

Underlying the three formations exists bedrock which can be loosely grouped as a combination of the following formations:

- Bimurra Volcanics;
- Foyle Volcanics;
- Mount Wyatt Formation;
- Saint Anns Formation;
- Silver Hills Volcanics; and
- Stones Creek Volcanics.

The Wirralie epithermal gold deposit is hosted by the late Devonian Mount Wyatt Formation, a formation consisted of labile siltstone and sandstone, epiclastic sediments, tuff, algal limestone pods, minor rhyolite and oligomictic quartz-pebble conglomerate (Geoscience Australia, 2016). Lithological data suggests that the Mount Wyatt Formation is directly overlain by the Suttor Formation around the ore body (northern portion of the ML. The Rosetta Creek Formation underlies the Suttor Formation south of the open cut pits. WGM geology is detailed in **Figure 2-6**Error! Reference source not found..



WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

GEOLOGY

FIGURE 2-6

LEGEND

- Major Watercourse
- Mining Lease

Surface Geology (2025)

- Bimurra Volcanics/s (DCvb/s)
- Qa-QLD (Qa)
- Qha-QLD (Qha)
- Qhh/m-QLD (Qhh/m)
- Suttor Formation (Tu)
- TQr-QLD (TQr)

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
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2.3.4 Soils

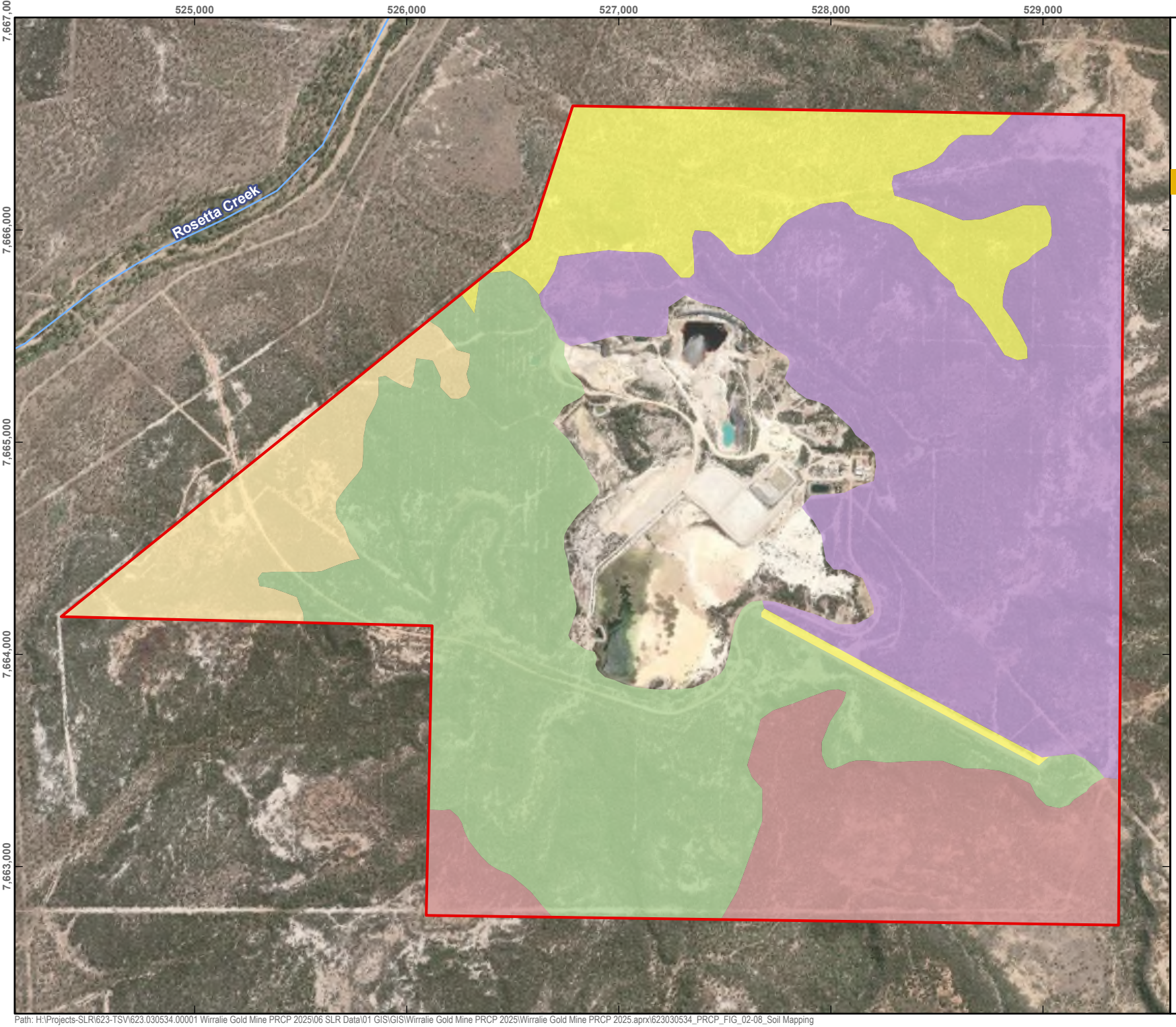
Five soil map units have been identified across WGM. Representative soil profiles are described in **Table 2-2** and chemical properties in **Table 2-3**. The distribution of soils is mapped in **Figure 2-7**. The Soils and Land Suitability Assessment is provided in full in **Appendix B**.

Table 2-2: Representative Soil Profiles

Australian Soil Classification	Area (ha)	Area (%)
Eutrophic Brown Dermosol, Deep	137.78	12.18
Leptic Brown Rudosol	365.22	32.30
Leptic Brown-Orthic Tenosol, Shallow	394.86	34.93
Sodic Brown Dermosol, Deep	148.40	13.12
Self-Mulching Brown Vertosol, Moderate	84.15	7.44

Table 2-3: Rehabilitation Related Chemical Properties

Soil Type	pH	EC (uS/cm)	Organic Carbon (%w/w)	CEC (meq/100mg)	ESP (%)
Eutrophic Brown Dermosol, Deep	5.3 – 6.0	12 - 15	0.63 – 0.83	3.3 – 3.5	<0.1
Leptic Brown Rudosol	4.4	234 – 142	1.46 – 1.96	2.9 – 3.6	<0.1 – 16.2
Leptic Brown-Orthic Tenosol, Shallow	4.7 – 4.9	19 - 20	0.29 – 0.46	1.3 – 1.5	<0.1
Sodic Brown Dermosol, Deep	6.0 – 6.4	13 - 108	0.14 – 0.43	5.6 – 9.2	2.9 – 32.4
Self-Mulching Brown Vertosol, Moderate	6.4 – 6.6	60 - 265	0.11 – 0.83	5.9 – 5.9	8.8 – 31.7



WIRRALIE GOLD MINE
PROGRESSIVE REHABILITATION AND CLOSURE PLAN

SOIL MAPPING

FIGURE 2-7

LEGEND

- Major Watercourse
- Mining Lease

Soil Mapping Units

- Eutrophic Brown Dermosol
- Leptic Brown Rudosol
- Leptic Brown-orthic Tenosol
- Self-mulching Brown Vertosol
- Sodic Brown Dermosol

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
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2.3.5 Land Suitability Assessment

Land Suitability has been assessed using the methods and criteria provided in the Guideline for Agricultural Land Evaluation (Department of Science Information Technology and Innovation and Department of Natural Resources and Mines, 2015) and Guideline for Land Suitability Assessment Techniques (Department of Mines and Energy, 1995). This assesses how suitable an area of land is for two major rural agricultural enterprises: rainfed broadacre cropping and beef cattle grazing.

The Land Suitability assessment cross-references each soil unit's characteristics with suitability criteria from Department of Mines and Energy (1995). The Land Suitability assessment uses a five-class system, where Class 1 indicates that the land is most suitable for the enterprise and Class 5 the least suitable. The overall land suitability ranking for each specific soil unit is determined by the most severe limitation, or a combination of the varying limitations. Land is considered less suitable as the severity of limitations for a land use increases. The increasing limitations may reflect any combination of:

- Reduced potential for production;
- Increased inputs to achieve an acceptable level of production; and/or
- Increased inputs required to prevent land degradation.

The Land Suitability Classes are described in **Table 2-4** and **Figure 2-8**.

Table 2-4: Land Suitability Classes

Class	Suitability	Limitations	Description
1	Suitable	Negligible	Highly productive land requiring only simple management practices to maintain economic production. Highly productive land requiring only simple management practices to maintain economic production.
2	Suitable	Minor	Land with limitations that either constrain production, or require more than the simple management practices of class 1 land to maintain economic production.
3	Suitable	Moderate	Land with limitations that either further constrain production, or require more than those management practices of class 2 land to maintain economic production.
4	Unsuitable	Severe	Currently unsuitable land. The limitations are so severe that the sustainable use of the land in the proposed manner is precluded. In some circumstances, the limitations may be surmountable with changes to knowledge, economics or technology.
5	Unsuitable	Extreme	Land with extreme limitations that preclude any possibility of successful sustained use of the land in the proposed manner.

WTS' analysis provides a considered approach to land suitability assessments whereby each soil management unit's characteristics have been cross-referenced against Department of Mines and Energy (1995) and Guidelines for Agricultural Land Evaluation in Queensland (Department of Science Information Technology and Innovation and Department of Natural Resources and Mines, 2015). The overall land suitability class for each SMU is determined by the most severe limitation, or a combination of varying limiting components under both the rainfed broadacre cropping and beef cattle grazing. The results are summarised in **Table 2-5** and **Table 2-6** and presented in full in **Appendix B**.

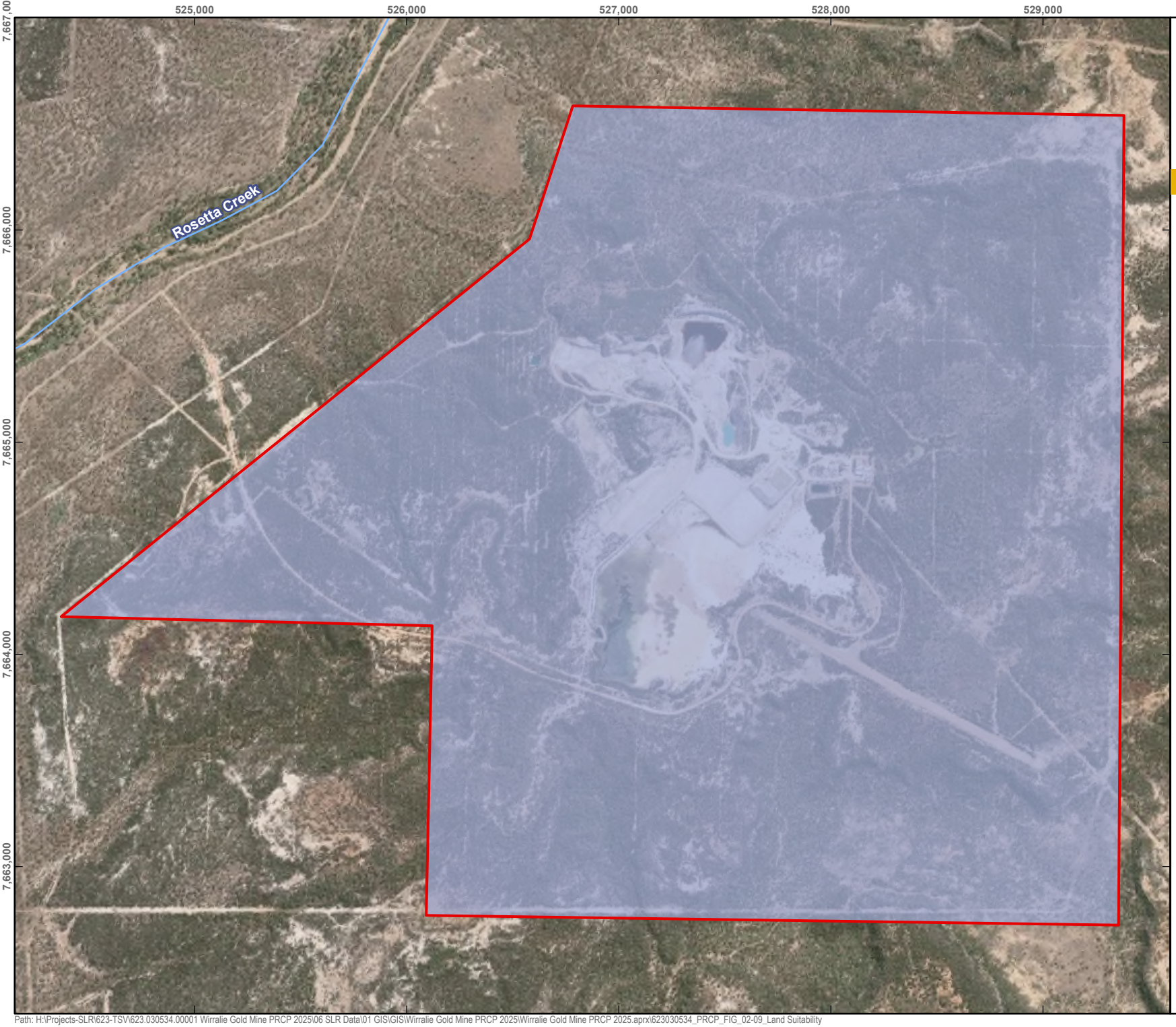
Table 2-5: Summary of Land Suitability Classes for Beef Cattle Grazing

Limitation	Eutrophic Brown Dermosol, Deep	Leptic Brown Rudosol	Leptic Brown-Orthic Tenosol, Shallow	Sodic Brown Dermosol, Deep	Sel-Mulching Brown Vertosol, Moderate
Water Availability	4	5	5	5	5
Nutrient Deficiency	1	5	4	1	1
Soil Physical Factors	1	1	2	1	1
Salinity	1	1	1	1	2
Rockiness	1	1	1	1	1
Microrelief	1	1	1	1	1
pH	1	3	3	1	1
ESP (10cm)	1	4	1	3	4
Wetness	1	1	1	2	2
Topography		5	5	5	5
Water Erosion	1	1	1	1	1
Flooding	1	1	1	1	1
Vegetation	4	4	4	4	4
Land Suitability Class	5	5	5	5	5

Table 2-6: Summary of Land Suitability Classes for Rainfed Broadacre Cropping

Limitation	Eutrophic Brown Dermosol, Deep	Leptic Brown Rudosol	Eutrophic Brown Dermosol, Deep	Eutrophic Brown Dermosol, Deep	Eutrophic Brown Dermosol, Deep
Water Availability	5	5	5	5	5
Nutrient Deficiency	1	4	1	1	1
Soil Physical Factors	1	1	3	1	1
Soil Workability	1	1	2	1	1
Salinity	1	1	1	1	2
Rockiness	1	1	1	1	1
Microrelief	1	1	1	1	1

Wetness	1	1	1	2	2
Topography	1	5	2	1	1
Water Erosion	1	1	1	1	1
Flooding	1	1	1	1	1
Land Suitability Class	5	5	5	5	5



WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

LAND SUITABILITY

FIGURE 2-8

LEGEND

- Major Watercourse
- Mining Lease

Land Suitability

- Class 5

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

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Date Drawn:	08-Apr-2026
Drawn by:	AS

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2.3.6 Land Stability

2.3.6.1 Soil Erosion Hazard

An assessment of soil erosion susceptibility is given in **Table 2-7**, which lists influencing factors for each soil type that has been identified at WGM.

Table 2-7: Soil Erosion Susceptibility

Soil Type	Sodicity	Texture	Landform	Groundcover	Erosion Susceptibility
Eutrophic Brown Dermosol, Deep	Non- Sodic	Clay Loam	Flat to gently undulated	20-50%	Low susceptibility
Leptic Brown Rudosol	Highly Sodic	Clay Loam	Flat to gently undulated	10-20%	Moderate susceptibility
Leptic Brown-Orthic enosol Shallow	Non- Sodic	Loamy Silt	Flat to gently undulated	<2%	High susceptibility due to sparse erosion protection
Sodic Brown Dermosol, Deep	Non sodic topsoil. Moderately sodic subsoil	Silty Loam	Flat to gently undulated	<2%	High susceptibility due to sparse erosion protection
Self-Mulching Brown Vertosol, Moderate	Sodic to highlysodic	Clay Loam to light/medium clay	Flat to gently undulated	20-50%	Moderate susceptibility

The International Erosion Control Association's (IECA) Best Practice Erosion and Sediment Control Guidelines (IECA 2008) sets erosion hazard based on average rainfalls for regions around Australia. IECA erosion hazard for the Charters Towers region is detailed in **Table 2-8**.

Table 2-8: Erosion Hazard (IECA, 2008)

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
H	H	H	L	VL	VL	VL	VL	VL	VL	L	H

Soil erosion presents a significant hazard on downstream receptors, particularly where ground cover is disturbed, and the soil is subject to erosive agents of wind and water. Soil erosion occurs when soil particles detach and are transported off site. This detachment and subsequent entrainment of sediment is affected by a range of factors, predominantly soil erodibility and steepness of terrain. Soil Erosion Hazard has been assessed for each soil type using the RUSLE equation to determine soil loss (t/ha/yr) and assess erosion risk. The RUSLE equation is outlined below:

$$A = R \times K \times LS \times C \times P$$

Where:

A = estimated average soil loss in tons per hectare per year

R = rainfall-runoff erosivity factor

K = soil erodibility factor

L = slope length factor

S = slope steepness factor

C = cover-management factor

P = support practice factor

RULSE calculations for each soil type are detailed in **Table 2-9**.

Table 2-9: RUSLE Calculations

Soil Type	R	K	LS	C	P	A
Eutrophic Brown Dermosol, Deep	1804	0.030	3.5	0.1	0.8	**15.5**
Leptic Brown Rudosol	1804	0.055	1.0	0.19	0.8	**15.0**
Leptic Brown-Orthic Tenosol, Shallow	1804	0.055	1.0	0.40	0.8	**31.75**
Sodic Brown Dermosol, Deep	1804	0.055	1.2	0.40	0.8	**38.1**
Self-Mulching Brown Vertosol, Moderate	1804	0.030	2.4	0.10	0.8	**10.39**

Regarding erosion risk, it is considered that:

- The average Australian rate of erosion is 6.3 t/ha/yr;
- A low rate of erosion is defined as less than (<) 0.5 t/ha/yr;
- A medium rate of erosion is defined as 0.5-10 t/ha/yr ; and
- A high rate of erosion is defined as greater than (>) 10 t/ha/yr (Lu et al. 2001).

All soil types identified at WGM, with the exception of Self-Mulching Brown Vertosol, express a high erosion risk. It is noted that high erosion rates reflect seasonal variance in climate, vegetation cover and seasonal rainfall. With vegetation coverage dominantly between <2 – 20 %, and seasonal heavy rainfall (November – April) soil may readily be lost naturally due to naturally low erosion protection. Self-Mulching Brown Vertosols have significantly higher vegetation cover and good erosion protection resulting in a lower erosion rate. However, erosion is still considered moderate for Self-Mulching Brown Vertosols due to soil Sodicity and the risk of dispersion where groundcover is disturbed.

2.3.7 Ecology

2.3.7.1 Flora

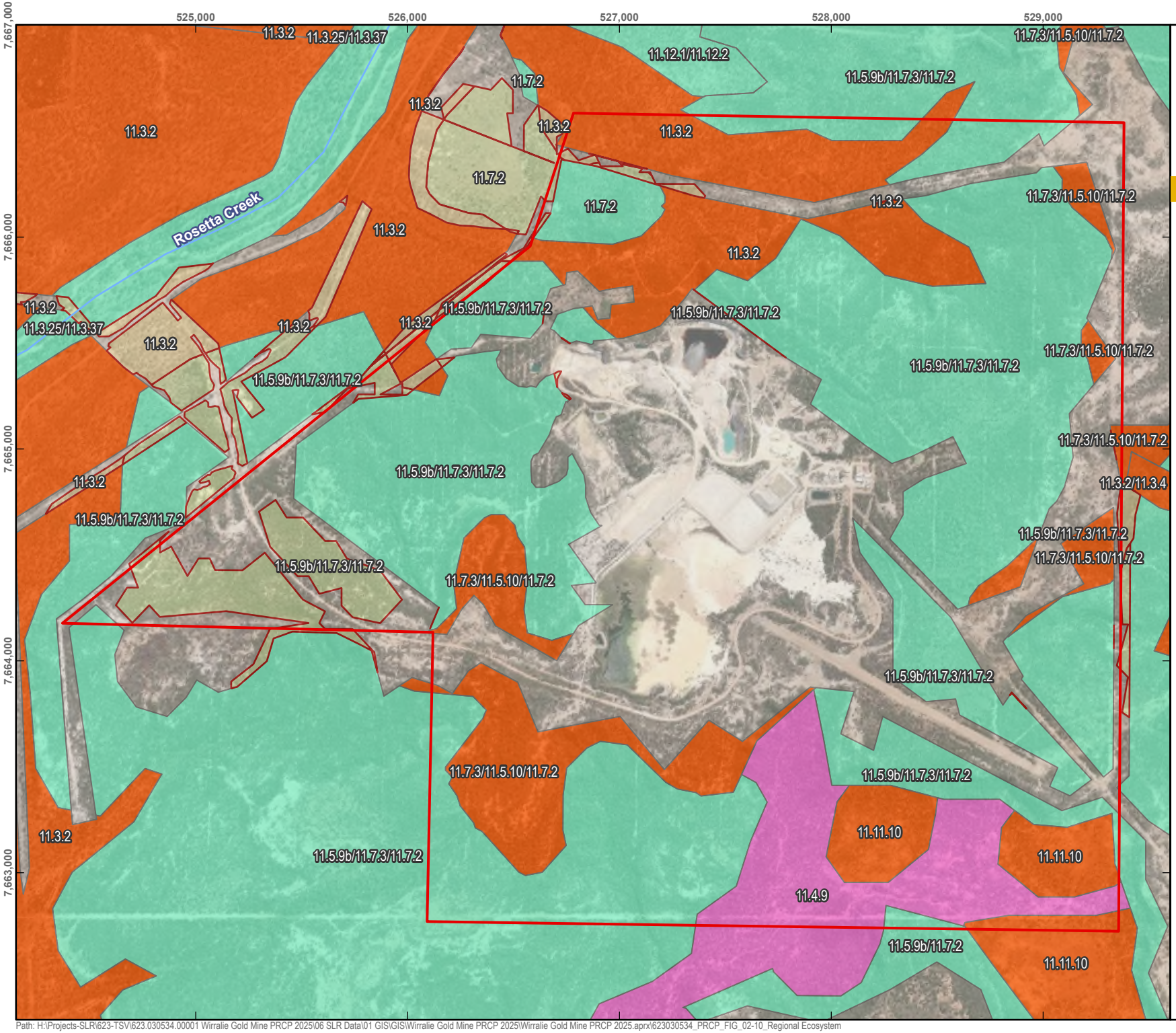
Vegetation Communities

WGM is located within the Brigalow Belt Bioregion (Bordering the Wyarra Hills and Beylando Downs Sub Bioregion). Regional ecosystem (RE) mapping shows WGM is located within a mosaic of remnant and non-remnant vegetation under the *Vegetation Management Act 1999* (VM Act) (**Figure 2-9**). The mapped remnant vegetation areas are comprised of mixed polygons with varying proportions of the REs detailed in **Table 2-10** (QLD, 2021). There were three REs identified that are classed as endangered under the VM Act, generally south of WGM. For a RE to be classified as endangered under the VM Act, the remnant vegetation will be less than 10 % (in the bioregion) or 10-30 % (and less than 10,000 ha) of its pre-clearing extent remains.

Table 2-10 Regional Ecosystems

Regional Ecosystem	Vegetation Management Act Class	Biodiversity Status	Description	Prescence relative to WGM
11.4.9	Endangered	Endangered	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	South
11.3.1	Endangered	Endangered	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	South-west
11.4.8	Endangered	Endangered	Eucalyptus cambageana woodland to open forest with Acacia harpophylla or Acacia argyrodendron on Cainozoic clay plains	South-west
11.3.2	Of concern	Of concern	Eucalyptus populnea woodland on alluvial plains	Surrounding
11.3.4	Of concern	Of concern	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	East
11.5.10	Of concern	Of concern	Melaleuca tamariscina tall open shrubland to low woodland on Cainozoic sand plains and/or remnant surfaces	North-west
11.3.25	Least concern	Of concern	Eucalyptus tereticornis or Eucalyptus camaldulensis woodland fringing drainage lines	South-west to north-east
11.7.3	Least concern	No concern at present	Eucalyptus persistens, Triodia mitchellii open woodland on stripped margins of Cainozoic lateritic duricrust	Surrounding
11.7.2	Least concern	No concern at present	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Surrounding
11.5.9	Least concern	No concern at present	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	Surrounding

Regional Ecosystem	Vegetation Management Act Class	Biodiversity Status	Description	Prescence relative to WGM
11.12.1	Least concern	No concern at present	Eucalyptus crebra woodland on igneous rocks	East to north-east
11.12.2	Least concern	No concern at present	Eucalyptus melanophloia woodland on igneous rocks	North
11.3.37	Least concern	No concern at present	Eucalyptus coolabah fringing woodland on alluvial plains	South-west to north-east



WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

REGIONAL ECOSYSTEM

FIGURE 2-9

LEGEND

- Major Watercourse
- Mining Lease

Vegetation management regional ecosystem

High-Value Regrowth

- Endangered
- Of Concern
- Least Concern

Remnant

- Endangered
- Of Concern
- Least Concern
- Non-Remnant

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
Drawn by:	AS

Path: H:\Projects-SLR\623-TSV\623.030534.00001 Wirralie Gold Mine PRCP 2025\06 SLR Data\01 GIS\GIS\Wirralie Gold Mine PRCP 2025\Wirralie Gold Mine PRCP 2025.aprx\623030534_PRCP_FIG_02-10_Regional Ecosystem

Threatened Flora

A search of the State mapping was conducted and determined that the following threatened flora species may exist at WGM.

- *Dichanthium setosum* (Bluegrass) – Possible occurrence however, no records within 50 km, suitable habitat mapped in region.
- *Samadera bidwilii* (Quassia) - Possible occurrence however, no records within 50 km, suitable habitat mapped in region.

2.3.7.2 Fauna

Threatened Fauna

WGM is located in the Brigalow Belt Bioregion. Site habitat consists primarily of acacia, eucalypt and melaleuca woodland and open forest on alluvial plains.

Desktop surveys were undertaken to determine that abundance and assemblage of fauna recorded within. A wide range of common, and non-threatened species were identified to potentially occur within WGM, including 7 amphibians, 137 birds, 32 mammals, and 25 reptiles. Threatened species that may occur within WGM MLs have been summarised below (**Table 2-11**).

Table 2-11 Threatened fauna within a 10 km radius of WGM

	Scientific Name	Common Name	Status	Type of Presence
Birds	Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Species or species habitat may occur within area.
	Erythrotriochis radiatus	Red Goshawk	Vulnerable	Species or species habitat likely to occur within area.
	Falco hypoleucos	Grey Falcon	Vulnerable	Species or species habitat may occur within area.
	Geophaps scripta scripta	Squatter Pigeon	Vulnerable	Species or species habitat likely to occur within area.
	Neochmia ruficauda ruficauda	Star Finch	Endangered	Species or species habitat likely to occur within area.
	Poephila cincta cincta	Southern Black-throated Finch	Endangered	Species or species habitat may occur within area.
	Tyto novaehollandiae kimberli	Masked Owl	Vulnerable	Species or species habitat may occur within area.
Migratory Marine Birds	Apus pacificus	Fork-tailed Swift	Threatened	Species or species habitat likely to occur within area.
Migratory Terrestrial Species	Cuculus optatus	Oriental Cuckoo	Threatened	Species or species habitat may occur within area.
	Motacilla flava	Western Yellow Wagtail	Threatened	Species or species habitat may occur within area.
	Actitis hypoleucos	Common Sandpiper	Threatened	Species or species habitat may occur within area.

	Scientific Name	Common Name	Status	Type of Presence
Migratory Wetland Species	Calidris acuminata	Sharp-tailed Sandpiper	Threatened	Species or species habitat may occur within area.
	Calidris melanotos	Pectoral Sandpiper	Threatened	Species or species habitat may occur within area.
	Gallinago hardwickii	Latham's Snipe	Threatened	Species or species habitat may occur within area.
	Pandion haliaetus	Osprey	Threatened	Species or species habitat may occur within area.
Mammals	Dasyurus hallucatus	Northern Quoll	Endangered	Species or species habitat may occur within area.
	Macroderma gigas	Ghost Bat	Vulnerable	Species or species habitat likely to occur within area.
	Phascolarctos cinereus	Koala	Vulnerable	Species or species habitat likely to occur within area.
Reptiles	Denisonia maculata	Ornamental Snake	Vulnerable	Species or species habitat likely to occur within area.
	Egernia rugosa	Yakka Skink	Vulnerable	Species or species habitat may occur within area.
	Lerista vittata	Mount Cooper striped lerista	Vulnerable	Species or species habitat may occur within area.

2.3.7.3 Matters Of National Environmental Significance

Using the Protected Matters Search Tool with a 10 km buffer, two listed threatened ecological communities were identified to have a likelihood of being in the region as detailed in **Table 2-12**. **Table 2-13** details the significant flora that may occur within 10 km of WGM.

Table 2-12 Matters of National Environmental Significance - Ecological Communities within 10 km of the Project (DAWE, 2020)

Listed Threatened Ecological Communities			
Name	Status	Description	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered (as of 2001)	Ranges from open woodland to open forest, characterised by the presence of Brigalow (Acacia harpophylla) as one of the three most dominant trees usually along with other Acacia, Eucalyptus, or Casuarina cristata.	Community known to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered (as of 2019)	Typically, grassy woodland with a canopy dominated by Eucalyptus populnea.	Community likely to occur within area

Table 2-13 Matters of National Environmental Significance that may occur within 10 km of the Project (DAWE, 2020)

Name	Status	Type of Presence
Dichanthium setosum Bluegrass	Vulnerable	Species or species habitat likely to occur within area.
Eucalyptus raveretiana Black Ironbox	Vulnerable	Species or species habitat likely to occur within area.
Samadera bidwilii Quassia	Vulnerable	Species or species habitat likely to occur within area.

2.3.7.4 Matters of State Environmental Significance

Using State mapping, Matters of State Environmental Significance (MSES) were identified at/ surrounding WGM. WGM MSES include:

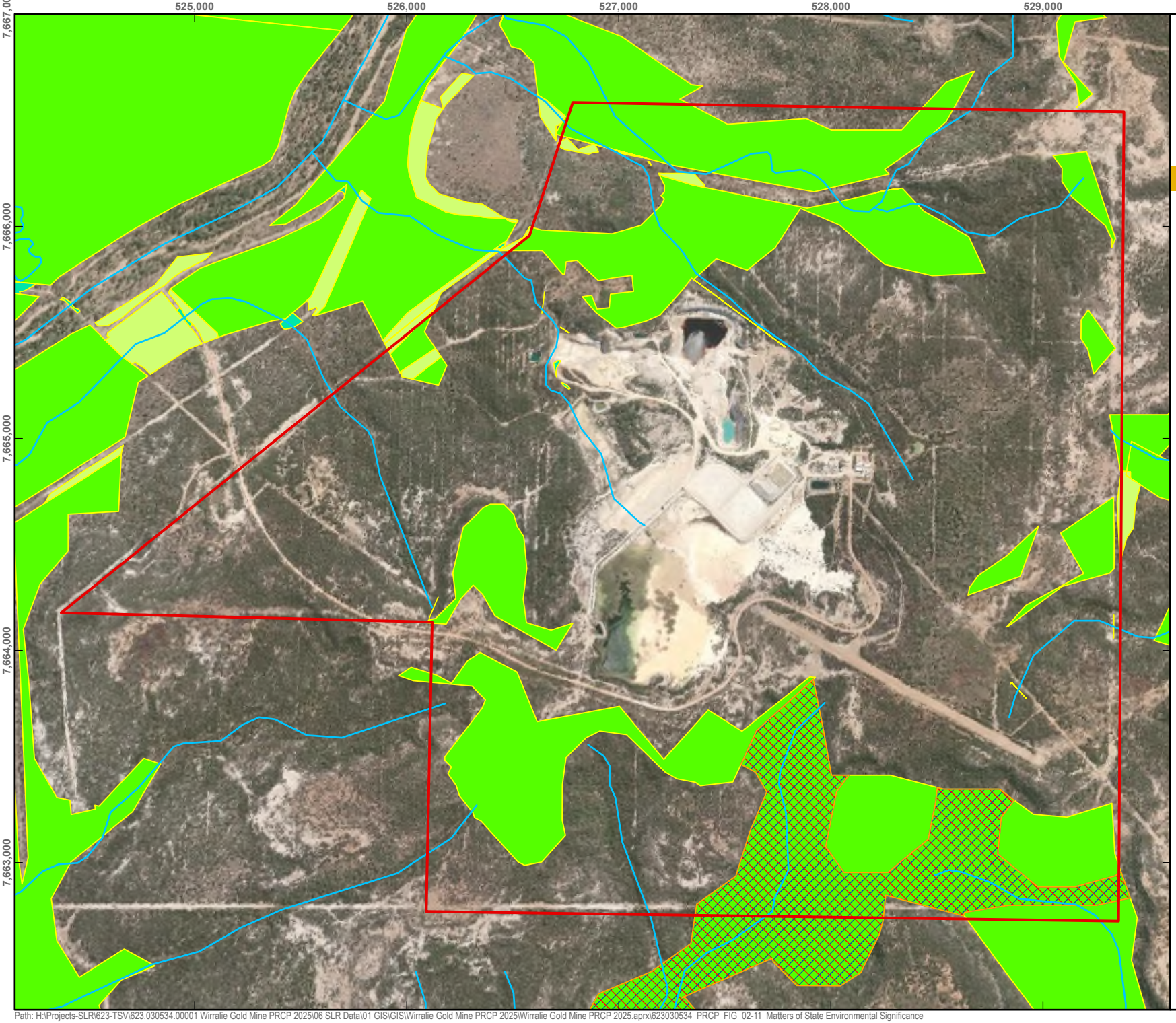
- MSES Regulated Vegetation (Essential Habitat);
- MSES Regulated Vegetation (GBR Riverine);
- MSES Regulated Vegetation (Category C);
- MSES Regulated Vegetation (Category B Endangered or of Concern);
- MSES Wildlife Habitat (Endangered or Vulnerable); and
- MSES Regulated Vegetation (Defined Watercourse).

MSES at WGM are displayed in **Figure 2-10**.

2.3.7.5 Environmentally Sensitive Areas

State mapping identified the presence of one Environmentally Sensitive Area (ESA) within/ surrounding WGM. ESAs of WGM are displayed in **Figure 2-11**.

Data for a desktop analysis of ESAs within the vicinity of ML1079 was requested from DESTI online. This analysis showed an environmentally sensitive area within the ML, and nearby. These ESAs were classified as “Endangered Regional Ecosystems – regrowth and remnant” (**Figure 2-9**).



WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

FIGURE 2-10

LEGEND

- Mining Lease
- MSES regulated vegetation [defined watercourse]
- MSES wildlife habitat [endangered or vulnerable]
- MSES regulated vegetation [essential habitat]
- MSES regulated vegetation [category R- GBR riverine]
- MSES regulated vegetation [category C- endangered or of concern]
- MSES regulated vegetation [category B - endangered or of concern]

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	10-Apr-2026
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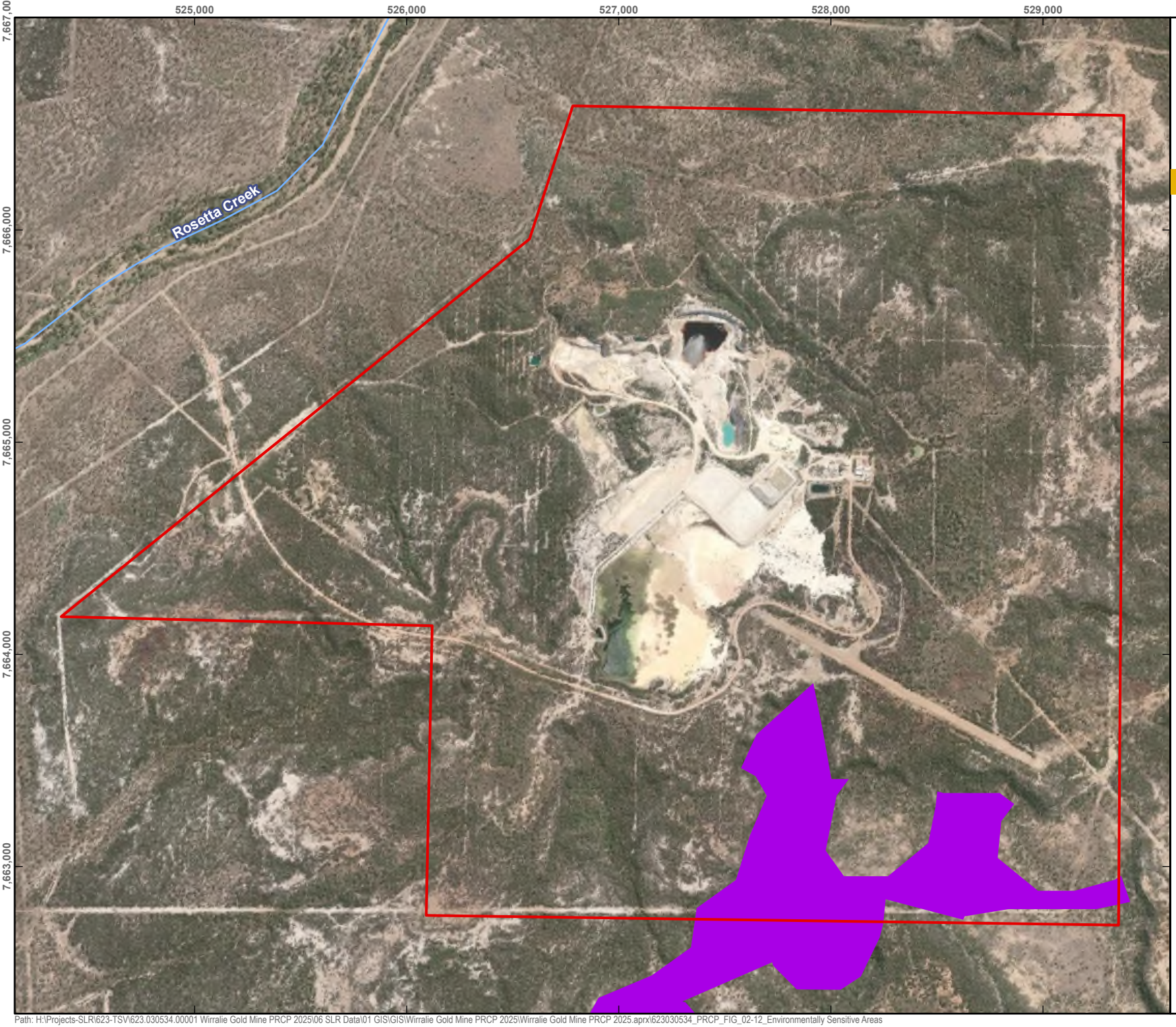


WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

ENVIRONMENTALLY SENSITIVE AREAS

FIGURE 2-11

LEGEND

- Major Watercourse
- Mining Lease
- Environmentally Sensitive Area

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
Drawn by:	AS

Path: H:\Projects-SLR\623-TSV\623.030534.00001 Wirralie Gold Mine PRCP 2025\06 SLR Data\01 GIS\GIS\Wirralie Gold Mine PRCP 2025\Wirralie Gold Mine PRCP 2025.aprx\623030534_PRCP_FIG_02-12_Environmentally Sensitive Areas

2.3.8 Surface Water

2.3.8.1 Surface Water Quality

Water quality monitoring is conducted at locations prescribed in Schedule C Table 1 of the EA, reproduced below in **Table 2-14**. Water quality is monitored against values defined in EA Schedule C – Table 2 (Receiving water contaminant limits), reproduced below in **Table 2-15**. A summary of water chemistry data collected from 2021 to 2023 is provided in Table 7.

Table 2-14 Surface Water Monitoring Points

Monitoring Point	Easting	Northing	Monitoring Frequency
SW1 - Tailings Dam Spillway	526752	7663974	Monthly when flowing
SW2 - Tailing Dam Runoff Dam	526747	7664998	Monthly when flowing
Tailings Dam Ponded Water	527793	7664832	Six Monthly
SW4 - Rosetta Creek	524242	7665490	Monthly when flowing
SW5 - Sugar Bag Creek	526557	7665405	Monthly when flowing
Sugar Bag Creek (Release Point 1)	526350	7665700	Opportunistic rising stage sampler at 1.8m
Drainage to Pit (Release Point 2)	527800	7665094	Monthly when flowing

Table 2-15 Surface Water Quality Monitoring Values

Parameter	Units	Limit Type	Contaminant Limits (unfiltered)
pH		Range	6 to 9
Total Dissolved Solids	mg/L	Maximum	4000
Sulphate	mg/L	Maximum	1000
Arsenic	mg/L	Maximum	0.5
Cadmium	mg/L	Maximum	0.01
Copper	mg/L	Maximum	0.5
Lead	mg/L	Maximum	0.1
Mercury	mg/L	Maximum	0.002
Molybdenum	mg/L	Maximum	0.05
Selenium	mg/L	Maximum	0.02
Zinc	mg/L	Maximum	20
WAD Cyanide	mg/L	Maximum	0.2

Table 2-16 Surface Water Chemistry (2021-2023)

Monitoring Point	pH (field)	TDS	Sulfate (SO4)	Arsenic Total	Cadmium Total	Copper Total	Lead Total	Mercury Total	Molybdenum Total	Selenium Total	Zinc Total	WAD Cyanide
Sampling Date	pH units	mg/L										
North Pit												
23/03/2023	2.47	4960	4040	5.62	0.0414	1.56	<0.001	<0.0001	0.008	0.04	5.52	<0.004
17/11/2021	3.18	10600	8760	13.7	0.0813	3.24	<0.001	<0.0001	0.021	0.05	11.2	<0.004
29/05/2023	2.42	7340	4520	6.75	0.0503	1.9	<0.001	<0.0001	0.01	0.03	6.93	<0.004
2/08/2023	n/d	7020	5200	7.06	0.052	1.99	0.001	<0.0001	0.01	0.03	7.53	<0.004
12/10/2023	2.40	7780	5670	8	0.0581	2.17	<0.001	<0.0001	0.01	0.04	8.56	<0.004
Runoff Dam												
22/03/2023	8.21	137	38	0.033	<0.0001	<0.001	<0.001	<0.0001	<0.001	<0.01	<0.005	<0.004
29/05/2023	5.81	159	47	0.014	<0.0001	0.001	<0.001	<0.0001	<0.001	<0.01	<0.005	<0.004
2/08/2023	n/d	271	69	0.048	<0.0001	0.002	0.001	<0.0001	<0.001	<0.01	0.007	<0.004
2/08/2023	n/d	239	60	0.02	<0.0001	0.001	<0.001	<0.0001	0.001	<0.01	<0.005	<0.004
Sugar Bag Creek (Release Point 1)												
01/02/2022	6.90	251	<1	0.014	<0.0001	<0.001	0.003	<0.0001	<0.001	<0.01	0.006	<0.004
SW1												
23/07/2021	n/d	n/d	1490	0.084	<0.0001	0.014	<0.001	<0.0001	0.043	<0.01	<0.005	0.007
SW2												
01/02/2022	3.93	296	123	0.006	0.0002	0.002	<0.001	<0.0001	<0.001	<0.01	0.053	<0.004
23/07/2021	n/d	n/d	308	0.004	0.0009	0.003	<0.001	<0.0001	<0.001	<0.01	0.202	<0.004
SW4												
20/09/2021	7.31	254	<1	0.008	<0.0001	0.001	0.003	<0.0001	0.001	<0.01	<0.005	<0.004

Monitoring Point	pH (field)	TDS	Sulfate (SO4)	Arsenic Total	Cadmium Total	Copper Total	Lead Total	Mercury Total	Molybdenum Total	Selenium Total	Zinc Total	WAD Cyanide
Sampling Date	pH units	mg/L										
01/02/2022	7.54	127	2	0.003	<0.0001	<0.001	<0.001	<0.0001	<0.001	<0.01	<0.005	<0.004
09/11/2022	7.15	161	2	0.005	<0.0001	<0.001	<0.001	<0.0001	<0.001	n/d	<0.005	<0.004
04/05/2023	n/d	134	2	0.004	<0.0001	<0.001	<0.001	<0.0001	<0.001	n/d	<0.005	<0.004
SW5												
29/05/2023	4.44	258	65	0.013	0.0002	0.005	<0.001	<0.0001	<0.001	<0.01	0.04	<0.004
11/10/2023	4.57	303	74	0.006	0.0002	0.003	<0.001	<0.0001	<0.001	<0.01	0.043	<0.004
02/02/2022	n/d	<10	<1	<0.001	<0.0001	<0.001	<0.001	<0.0001	<0.001	<0.01	<0.005	<0.004
TSF												
17/11/2021	8.45	8230	3050	0.080	0.0002	0.027	<0.001	<0.0001	0.078	0.01	<0.005	0.012
31/05/2022	7.86	265	38	0.019	<0.0001	0.002	0.001	n/d	<0.001	<0.01	0.007	<0.004
11/08/2022	8.17	1610	586	0.069	<0.0001	0.007	<0.001	n/d	0.037	<0.01	<0.005	0.006
08/11/2022	7.15	2700	59	0.155	<0.0001	0.006	0.001	<0.0001	0.04	<0.01	0.009	<0.004
22/03/2023	8.50	1460	570	0.242	<0.0001	0.002	<0.001	<0.0001	0.030	<0.01	<0.005	<0.004
30/05/2023	6.04	1920	748	0.217	<0.0001	0.004	<0.001	<0.0001	0.04	<0.01	0.019	<0.004
2/08/2023	n/d	2780	866	0.225	<0.0001	0.007	<0.001	<0.0001	0.05	<0.01	<0.005	<0.004
12/10/2023	7.05	4180	1470	0.285	<0.0001	0.005	<0.001	<0.0001	0.046	<0.01	<0.005	<0.004
Turkey's Nest												
2/08/2023	n/d	2680	926	0.385	0.0001	0.002	<0.001	0.0002	0.259	0.04	<0.005	2.61
12/10/2023	7.55	1180	78	0.015	<0.0001	0.003	<0.001	<0.0001	0.002	<0.01	<0.005	<0.004
29/05/2023	6.28	198	48	0.024	<0.0001	0.002	<0.001	<0.0001	<0.001	<0.01	<0.005	<0.004

2.3.8.2 Surface Water Environmental Values

There are no specified EV or WQO's for the Suttor River sub-basin under the Environmental Protection Policy (Water and Wetland Biodiversity) Policy 2019. Draft EVs and WQOs for the Burdekin Basin were released for comment in 2017 and are still under review. The EVs and WQOs for the Burdekin Basin were based on the Burdekin Region Water Quality Improvement Plan 2016 (NQ Dry Tropics 2016). NQ Dry Tropics (2016) highlighted the following draft EVs for Rosetta Creek:

- Aquatic ecosystems;
- Human uses:
    - Irrigation;
    - Livestock;
    - Visual amenity;
    - Drinking water;
    - Industrial uses; and
    - Cultural and spiritual.

2.3.9 Groundwater

Regionally, Wirralie is located within the northeastern portion of the Drummond Basin, comprising Upper Devonian to Lower Carboniferous volcanic and sedimentary sequences. The site is located southeast of the Anakie Inlier and is underlain by a sequence of volcaniclastic and sedimentary units associated with the basin's early depositional cycles (**Appendix H**).

Gold mineralisation at the site is hosted within a low-grade, low-sulfidation epithermal quartz vein system associated with the Mount Wyatt Formation. This unit comprises volcaniclastic sediments with interbedded lapilli and crystal tuffs and is characterised by fracture-controlled mineralisation. The presence of fractures and vein networks is a key control on local permeability and groundwater movement within the bedrock.

Groundwater occurrence at WGM is controlled by a sequence of weathered and fractured bedrock units overlain by minor unconsolidated sediments. The principal hydrostratigraphic units are:

- Mount Wyatt Formation
- Rosetta Creek Formation
- Suttor Formation
- Minor colluvial and alluvial deposits.

The Mount Wyatt Formation forms the primary bedrock unit hosting mineralisation and is characterised by low primary porosity due to its crystalline nature. Groundwater flow within this unit is therefore controlled by secondary porosity associated with fractures, quartz veining, and structural features. A weathered, clay-rich zone (approximately 5 to 21 m thick) overlies the fresh bedrock and may act as a semi-confining layer, locally influencing vertical groundwater movement.

The Rosetta Creek Formation comprises interbedded sandstone, conglomerate, and clay-rich units and exhibits variable primary porosity depending on grain size, sorting, and clay content. This unit is locally discontinuous and is inferred to have limited spatial extent across the site.

The Suttor Formation forms the uppermost bedrock unit across much of the site and consists predominantly of weathered sandstone with variable clay content. Primary porosity within this unit is variable and generally decreases with increasing clay content and ferruginisation (iron enrichment and cementation).

Unconsolidated colluvial and alluvial deposits occur locally in low-lying areas and drainage lines. These materials comprise poorly sorted clay, silt, sand, and gravel and may locally support shallow groundwater movement, although they are generally limited in extent and thickness. Overall, groundwater flow at the site is interpreted to occur predominantly within the weathered and fractured bedrock profile, with the Mount Wyatt Formation representing the primary pathway for groundwater movement and pit inflow.

2.3.9.1 Groundwater Levels and Quality

Groundwater levels at Wirralie have been monitored on a monthly to quarterly basis since the installation of monitoring bores in 2021 (**Table 2-17**). Groundwater levels are generally greater than 20 m below ground level across the site, with shallower water levels of approximately 10 m below ground level observed locally at bore WTB05 (**Figure 2-12**).

Temporal fluctuations of up to approximately 5 m are observed; however, groundwater levels are generally stable over time, with no consistent long-term or seasonal trends evident across the monitoring network.

The absence of clear seasonal or long-term trends, despite periods of above-average rainfall, indicates that groundwater recharge is limited and occurs slowly. This behaviour is consistent with the climatic conditions at the site, which are characterised by high evaporation and low effective rainfall, as well as the relatively low to moderate hydraulic conductivity of the hydrostratigraphic units.

The potentiometric surface indicates that groundwater flow is controlled by topography, with flow generally directed towards lower elevation areas associated with local drainage systems.

Table 2-17: Monitoring Bores Details

Proposed ID	Easting	Northing	Target Lithology	Total Depth (mBGL)	Screen depth (mBGL)
WTB04	527407	7664918	Weathered Rosetta Creek/Sutton Formation	28	22-28
WTB05	526748	7665239	Weathered Rosetta Creek/Sutton Formation	28	22-28
WTB06	527319	7665825	Weathered Rosetta Creek Formation	50	29-50
WTB07	526809	7663693	Weathered Rosetta Creek/Sutton Formation	25	19-25
WTB08	526845	7663693	Rosetta Creek Formation	76	55-76

The potentiometric surface indicates that groundwater flow is controlled by topography, with flow generally directed towards lower elevation areas associated with local drainage systems. Pit A and Deep Lead Pit are interpreted to be hydraulically connected to the groundwater system, whereas water bodies within North Pit and Pit B are interpreted to be perched above the regional water table.

Overall, groundwater conditions at the site are characterised by:

- Relatively deep water levels;
- Limited and diffuse recharge;
- Low hydraulic gradients; and
- Stable groundwater conditions with minimal temporal variability.

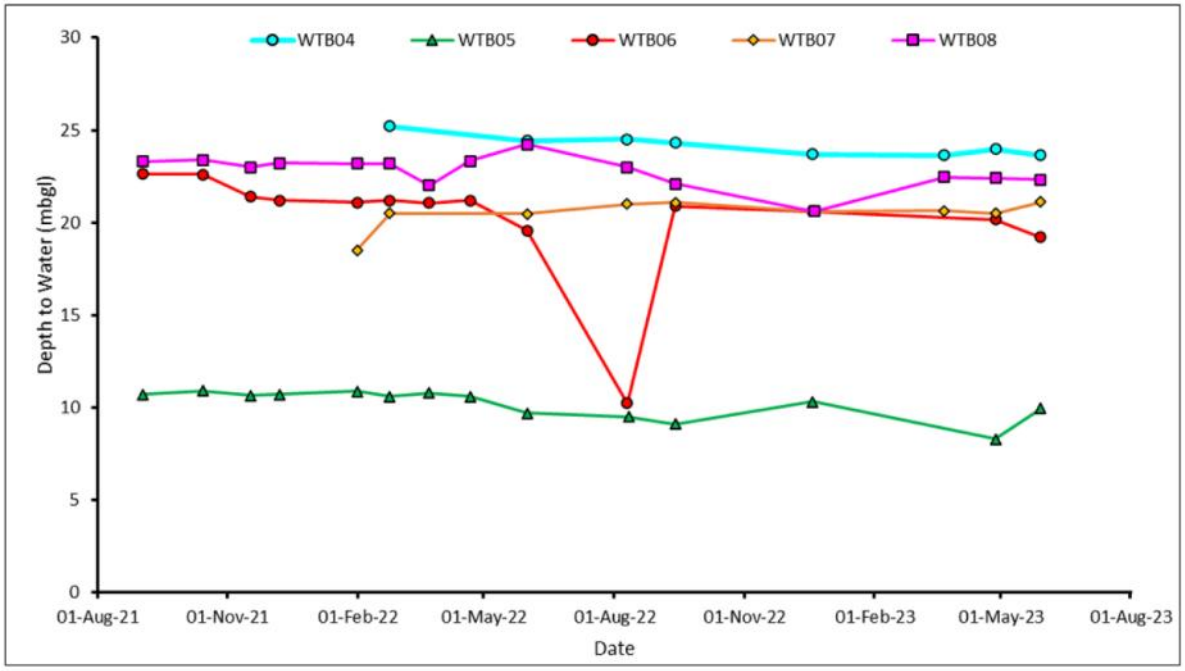


Figure 2-12 Groundwater Levels at Wirralie (Appendix H)

Groundwater quality across the site is variable, with several parameters indicating potential influence from mining activities. At metalliferous mine sites, indicators of potential impact typically include low pH, elevated total dissolved solids (TDS), increased sulfate concentrations, elevated metal concentrations, and variations in sulfate to chloride ratios. At least one of these indicators is present in each monitoring bore; however, due to the absence of background reference locations, it is not possible to definitively distinguish between natural baseline conditions and mining-related impacts.

Groundwater pH across the monitoring network ranges from approximately 3 to 8. Groundwater in bores WTB06, WTB07, and WTB08 is generally circum-neutral to slightly acidic, which is within the range reasonably expected for groundwater in the region. In contrast, groundwater in WTB04 is acidic and groundwater in WTB05 is very acidic. These low pH values are not fully consistent with the 2021 waste rock characterisation results, which indicated that the sampled waste material generally had a low acid-forming potential.

Overall, groundwater quality at Wirralie is spatially variable and reflects a combination of natural geochemical processes and likely localised influence from historical and current mining activities. The available data indicate that some bores exhibit water quality characteristics consistent with mining-related seepage or geochemical influence; however, the absence of

background reference bores means attribution cannot be made with certainty across the entire site (**Appendix H**).

Groundwater is not currently used as a drinking water supply in the vicinity of the Project. Although historical mining operations sourced water from nearby borefields for operational purposes, no evidence has been identified of nearby third-party groundwater use for potable supply in the immediate Project area.

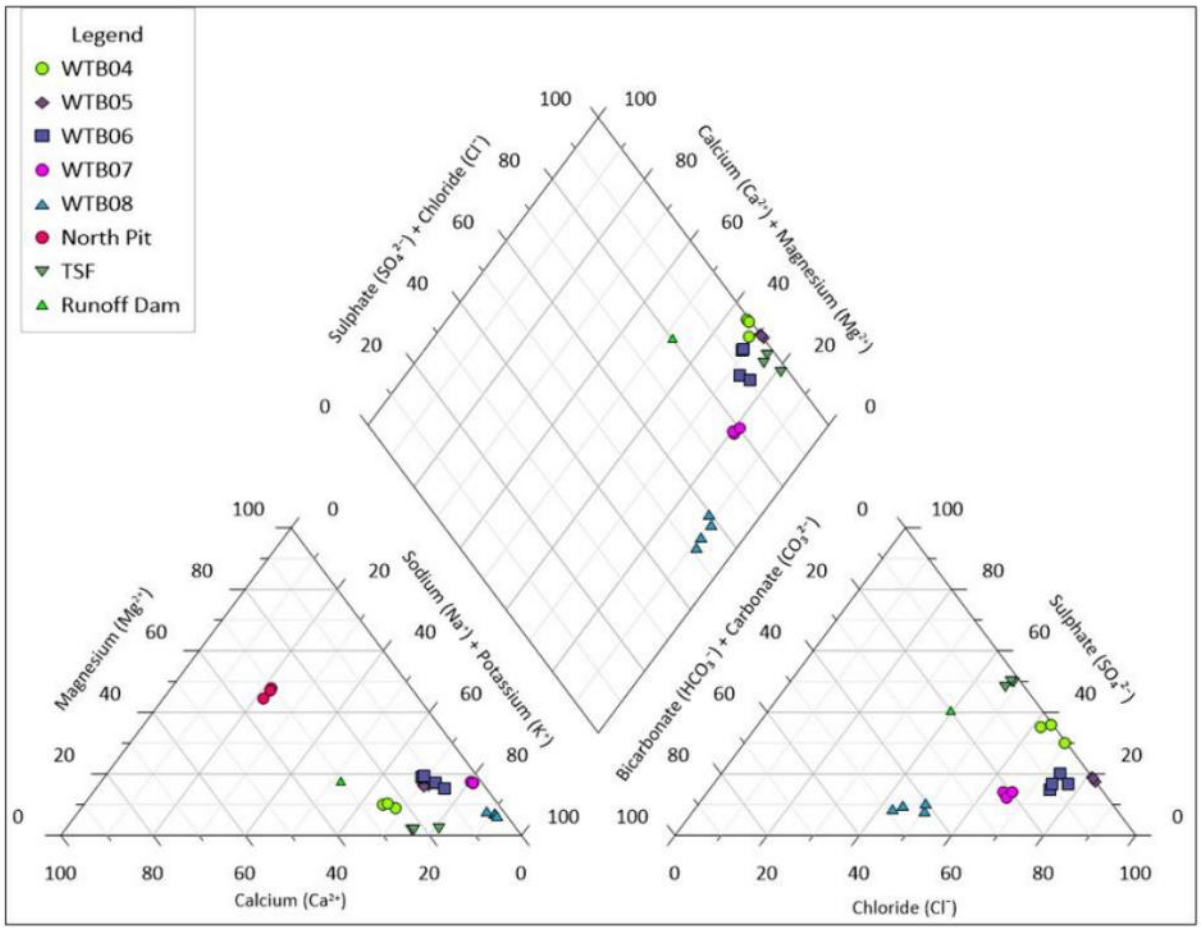


Figure 2-13 Piper Diagram of Wirralie Groundwater Bores (Appendix H)

Table 2-18 Baseline Groundwater Data August 2021 – August 2023 (Appendix H)

Bore ID	Analyte	pH	TDS	SO4	Ar	Cd	Cu	Fe	Pb	Mn	Mo	Se	Zn	Hg	Cyanide
	Units	pH units	gl/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	LoR			1	0.001	0.0001	0.001	0.05	0.001	0.001	0.001	0.01	0.005	0.0001	0.004
WTB04	Min	3.87	283	46	0.0005	0.00005	0.002	0.025	0.0005	0.641	0.0005	0.005	0.024	0.00005	0.002
	Median	4.62	416	72	0.0005	0.0001	0.007	0.025	0.0005	0.773	0.0005	0.005	0.121	0.00005	0.002
	Max	5.47	720	88	0.008	0.0003	0.027	0.2	0.0005	0.902	0.002	0.005	0.268	0.00005	0.002
	No. of samples	9	9	9	9	9	9	3	9	3	9	9	9	9	9
WTB05	Min	3.15	4810	1460	0.007	0.0043	0.015	0.26	0.002	6.76	0.0005	0.005	2.28	0.00005	0.002
	Median	3.65	11400	1660	0.01	0.0046	0.035	0.34	0.0065	6.86	0.0005	0.0075	3.105	0.00005	0.002
	Max	7.47	15500	1880	0.023	0.0054	0.651	0.5	0.036	7.27	0.0005	0.02	4.63	0.0101	0.002
	No. of samples	17	17	17	14	14	14	3	14	3	14	14	14	14	17
WTB06	Min	6.32	9860	1360	0.002	0.00005	0.0005	0.025	0.0005	2.18	0.002	0.005	0.0025	0.00005	0.002
	Median	6.76	13600	1950	0.003	0.0002	0.001	0.025	0.0005	4.14	0.004	0.005	0.00475	0.00005	0.002
	Max	7.9	15700	2130	0.005	0.0024	0.004	0.025	0.0005	8.42	0.013	0.005	0.192	0.00005	0.002
	No. of samples	17	17	17	14	14	14	3	14	3	14	14	14	14	17
WTB07	Min	6.37	2330	273	0.0005	0.00005	0.0005	0.025	0.0005	0.0005	0.003	0.005	0.0025	0.00005	0.002
	Median	6.725	2545	295.5	0.0005	0.00005	0.00075	0.025	0.0005	0.102	0.0035	0.005	0.0075	0.00005	0.002
	Max	7.46	2770	323	0.002	0.0003	0.001	0.025	0.0005	0.81	0.01	0.005	0.035	0.00005	0.002
	No. of samples	10	10	10	10	10	10	3	10	3	10	10	10	10	10
WTB08	Min	5.79	378	40	0.0005	0.00005	0.0005	0.025	0.0005	0.004	0.0005	0.005	0.0025	0.00005	0.002
	Median	6.77	594	43.5	0.0005	0.00005	0.0005	0.025	0.0005	0.015	0.001	0.005	0.0025	0.00005	0.002
	Max	7.45	676	62	0.0005	0.00005	0.017	0.025	0.0005	0.026	0.002	0.005	0.07	0.00005	0.002
	No. of samples	16	16	16	14	14	14	3	14	3	14	14	14	14	16

2.3.9.2 Groundwater Receptors

A source-pathway-receptor assessment undertaken for WGM (**Appendix H**) indicates that:

- The principal potential groundwater sources are the pits, WRDs, TSF, and secondarily the HLP, ROM and smaller water storages;
- The principal stressors are acidity, sulfate, salinity, metals/metalloids, and localised groundwater level change;
- The only material pathway considered is groundwater; and
- The most relevant receptors are potential terrestrial GDEs, with aquatic GDEs considered low likelihood and industrial groundwater use considered low sensitivity in the local receptor context.

2.3.9.3 Groundwater Dependent Ecosystems

The hydrogeological setting indicates that groundwater levels are generally too deep to support shallow aquatic dependency within the Project area. Surface water features in the vicinity, including local drainage lines and Rosetta Creek, are ephemeral and show no evidence of sustained baseflow contribution from groundwater.

Based on these conditions, aquatic GDEs are considered unlikely to occur within the Project area or in nearby drainage systems. While retained as a conservative receptor in the assessment, the likelihood of groundwater-dependent aquatic ecosystems being present and hydraulically connected to the site is low.

Groundwater depths in the broader region are typically on the order of approximately 10 to 30 metres below ground level, which may fall within the rooting depth of certain vegetation communities. The most plausible locations for terrestrial GDEs are along lower-lying areas and drainage features, including the Rosetta Creek corridor. However, the presence of terrestrial GDEs has not been confirmed within or immediately adjacent to the Project area. Accordingly, terrestrial GDEs are treated as a potential, but unconfirmed, receptor. This approach is conservative and appropriate for closure assessment, allowing both groundwater level and groundwater quality pathways to be considered (**Appendix H**).

There are no mapped subterranean GDEs, cave systems, or karst features identified within the Project area or its immediate vicinity. On this basis, subterranean GDEs are not considered a relevant environmental value for groundwater at the Project.

2.3.10 Existing and Surrounding Land Uses

Prior to mining activities commencing, the land use within the ML was low-quality cattle grazing. The two major land uses in the Suttor River Sub-basin are cattle grazing (more than 80 per cent) and dryland cropping, including sugarcane and wheat. Much of the native vegetation and riparian forests have been cleared in the past decades for this land use.

Regionally, the Project is located within the rural zone under the Whitsunday Regional Council (WRC) Planning Scheme. Within the WRC, agriculture is the biggest land use, however, mining is the biggest economic driver for the region, chiefly for coal and gold.

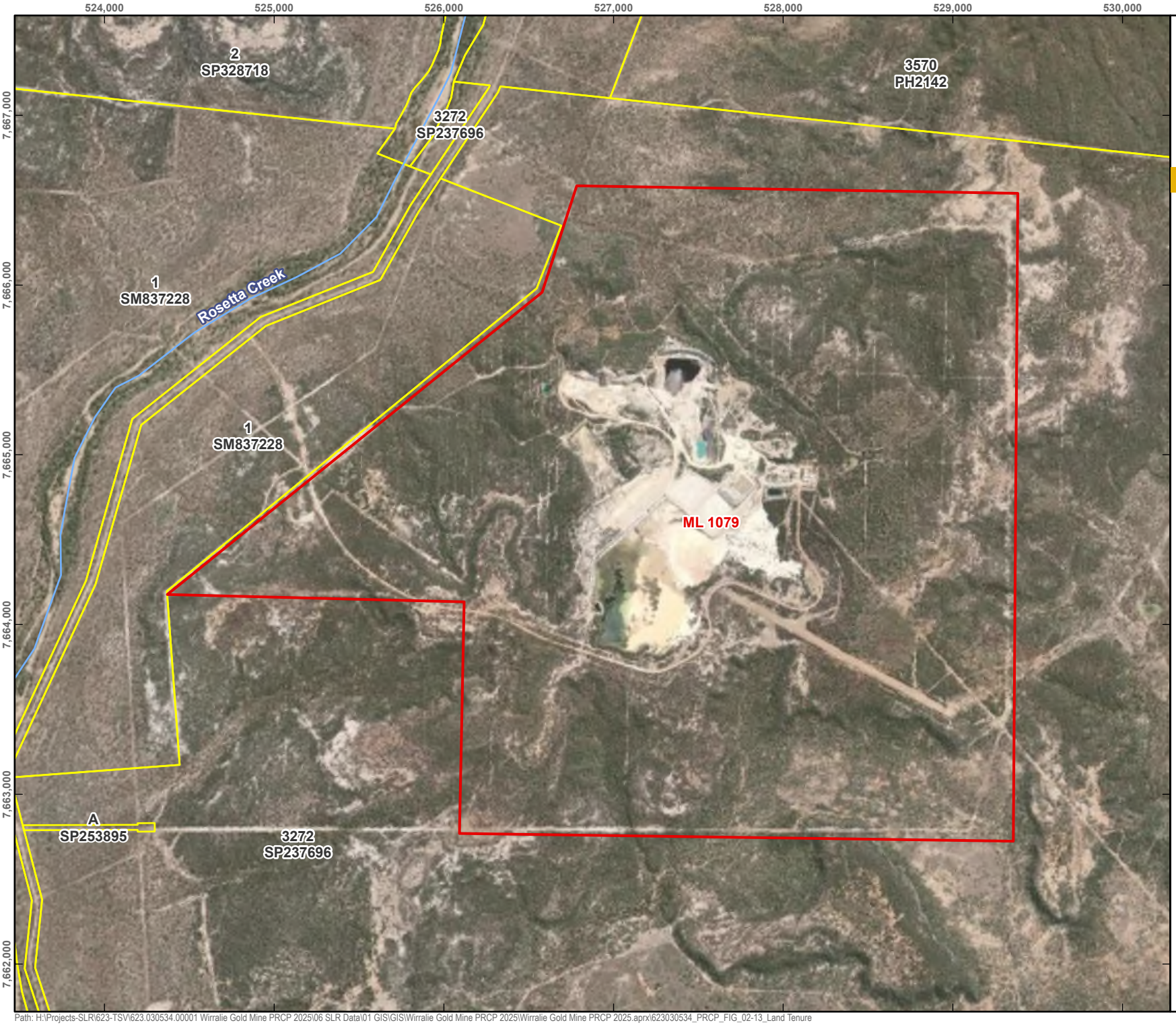
The WGM ML area does not contain areas of regional interest (priority living areas, priority agricultural areas, strategic cropping land and strategic environmental areas) protected under the Regional Planning Interests Act 2014 (QLD, 2021).

2.3.11 Land Tenure

WGM is located on Wirralie Station, described as freehold land on Lot 3272 on Plan SP237696 (**Table 2-19** and **Figure 2-14**).

Table 2-19 Land Tenure

Description	Property Details
Company Name – can	Solomons Gold Pty Ltd – 82 601 398 841
Landholders	Wirralie Station
Lot on Plan	Lot 3272 on Plan SP237696
Property Size	20,100 ha
Local Government Area	Whitsunday Regional Council
Zoning Information	Freehold



WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

LAND TENURE

FIGURE 2-12

LEGEND

- Major Watercourse
- Mining Lease
- Cadastral Boundary

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:30,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
Drawn by:	AS

2.3.11.1 Sensitive Receptors

There are no sensitive receptors (e.g. businesses, residences, buildings, etc) within a 10 km radius of WGM.

2.4 Design for Closure

Design for closure is not a requirement for transitional PRCPs.

2.5 Rehabilitation Planning

Progressive rehabilitation will occur as applicable disturbance areas become available. Current estimates show that WGM will cease operations in 2037, at this time, most disturbance areas will become available for rehabilitation, excluding the TSF due to a drying period that will be required and some infrastructure which will be required for rehabilitation activities (**Table 2-20**).

Table 2-20 WGM Rehabilitation Planning

Domain	Area (ha)	RA/IA	Date available for Rehabilitation	Progressive Rehabilitation Possible	Comments
Open Cut Pits	22.2	IA1	2037	Limited	The Blinky pit is a historical pit that is full of water. Other pits are being used until closure.
WRDs	24.1	RA3	2037	Limited	Some areas of the WRDs have commenced rehabilitation. Other areas of the WRDs will be needed for the rehabilitation of the TSF.
TSF and heap leach	73.6	RA4	2037	No	The TSF will be required until operations finish.
Infrastructure and stockpiles	35.6	RA1	2037	No	Infrastructure will be required until operations finish.
Access tracks, roads and haul roads	58.9	RA1	2042	No	Roads and tracks will be required for access and to facilitate rehabilitation (once operations cease), Roads and tracks will therefore be available for rehabilitation later than other domains.
Exploration	26.9	RA1	2037	Yes	Exploration will be rehabilitated progressively in accordance with the Eligibility criteria and standard conditions.
Runoff Dam	5.4	RA5	2037	No	The runoff dam will be required until operations finish.
Processing Plant and ROM	3.3	RA2	2037	No	The Processing Plant and ROM will be required until operations finish.

2.6 Existing Rehabilitation

Approximately 21.24 ha of the WGM has been rehabilitated by previous owners in 2002. WGM has implemented an annual rehabilitation monitoring program to evaluate the success of the rehabilitation and to inform future maintenance efforts. Rehabilitation monitoring conducted in 2022 and 2023 show some erosion on longer and steeper slopes where water flow accumulates; these areas will require rework or maintenance. There is limited information available regarding the commencement and completion of existing rehabilitation. For the purposes of the PRCP schedule it is assumed that these areas may require further rehabilitation work and therefore all the relevant rehabilitation milestones will still apply.

As of April 2026, there are no rehabilitation areas that are certified.

Historic exploration disturbances, primarily being drill pads, have been rehabilitated in accordance with the EA and the Code of Environmental Compliance for Exploration and Mineral Development.

3.0 Post Mining Land Uses

A PMLU is defined under s112 EP Act as the purpose for which the land will be used after all relevant activities for the PRCP carried out on the land have ended. A PMLU must meet the definition of stable condition. Land is in a stable condition if:

a) The land is safe and structurally stable;

b) There is no environmental harm being caused by anything on or in the land; and

c) The land can sustain a PMLU.

The EP Regulation requires that each PMLU:

a) Is viable, having regard to the use of land in the surrounding region; and

b) Satisfies at least one of the following:

   i. The use is consistent with how the land was used before a mining activity was carried out on the land;

   ii. The use is consistent with a development approval relating to the land;

   iii. The use is consistent with a use of the land, other than a use that is mining, permitted under a State or Commonwealth Act, including, for example, a planning instrument under the *Planning Act 2016*; or

   iv. The use will deliver, or is aimed at delivering, a beneficial environmental outcome.

3.1 Pre-approved PMLUs

Under the transitional provisions of the EP Act, existing approved PMLUs are able to be transitioned into the PRCP without further assessment or public notification.

Existing approvals must be included in a LOD. LODs are listed in section 750 of the EP Act and include:

a) An EA;

b) A document made under a condition of an EA that:

   i. Relates to the management or rehabilitation of land (e.g., rehabilitation and closure plan or residual void management plan); and

   ii. Was provided to the administering authority, and had not been superseded, before 30 November 2018; and

   iii. Before 15 January 2019, the administering authority had not notified the EA holder that the document was insufficient.

c) A document made under a condition of an EA that:

   i. Relates to the management or rehabilitation of land (e.g., rehabilitation and closure plan or residual void management plan); and

   ii. Was provided to the administering authority between 20 November 2019 and 30 November 2021; and

   iii. Within 20 business days after receiving the document, the administering authority had not notified the EA holder that the document was insufficient.

d) A report evaluating an EIS under section 34D of the *State Development and Public Works Organisation Act 1971* (SDPWO Act);

e) An EIS assessment report;

f) A written agreement between the EA holder and the State that is in force on 30 November 2018.

The LOD associated with WGM is the EA (EPML00772413) which was originally granted in October 2016 and most recently amended in March 2026.

The post mine land descriptions for WGM are currently prescribed in Schedule F Table 1 (Final Land Use and Rehabilitation Approval Schedule) of the EA. These are presented below in Table 3-1 along with the proposed PMLUs.

Table 3-1 EA approved PMLUs

Disturbance Type	Projected Surface Area (ha)	Final Land Outcome
Tailings Dam	73.6	Grassland
Infrastructure	76.5	Low Intensity Grazing
Waste Dump	24.1	Grassland
Exploration	26.9	Low Intensity Grazing
Open Cut Pit	22.2	NUMA
Stockpile Area	9.6	Low Intensity Grazing
Village	8.4	Low Intensity Grazing
Processing Plant	1.4	Low Intensity Grazing
Runoff dam	5.4	Water Storage
ROM Pad	1.9	Low Intensity Grazing

3.2 PMLUs

The Project's PMLUs are proposed to be transitioned as currently pre-approved by the EA, and further described in **Table 3-2.** The predominant PMLUs for the Project are 'Low Intensity Grazing' and 'Grassland'.

Table 3-2 PMLUs and Applicability

Proposed PMLU	Definition	Applicability
Low Intensity Grazing	Land will support light cattle grazing as per the surrounding environment and pre-mining land use. This PMLU meets the requirement of Table F1 of the EA	• Ancillary infrastructure, haul roads, access tracks, ROM pads, laydowns, magazine, topsoil stockpile areas and exploration areas. • Raw water dam & Evaporation pond • All undisturbed areas

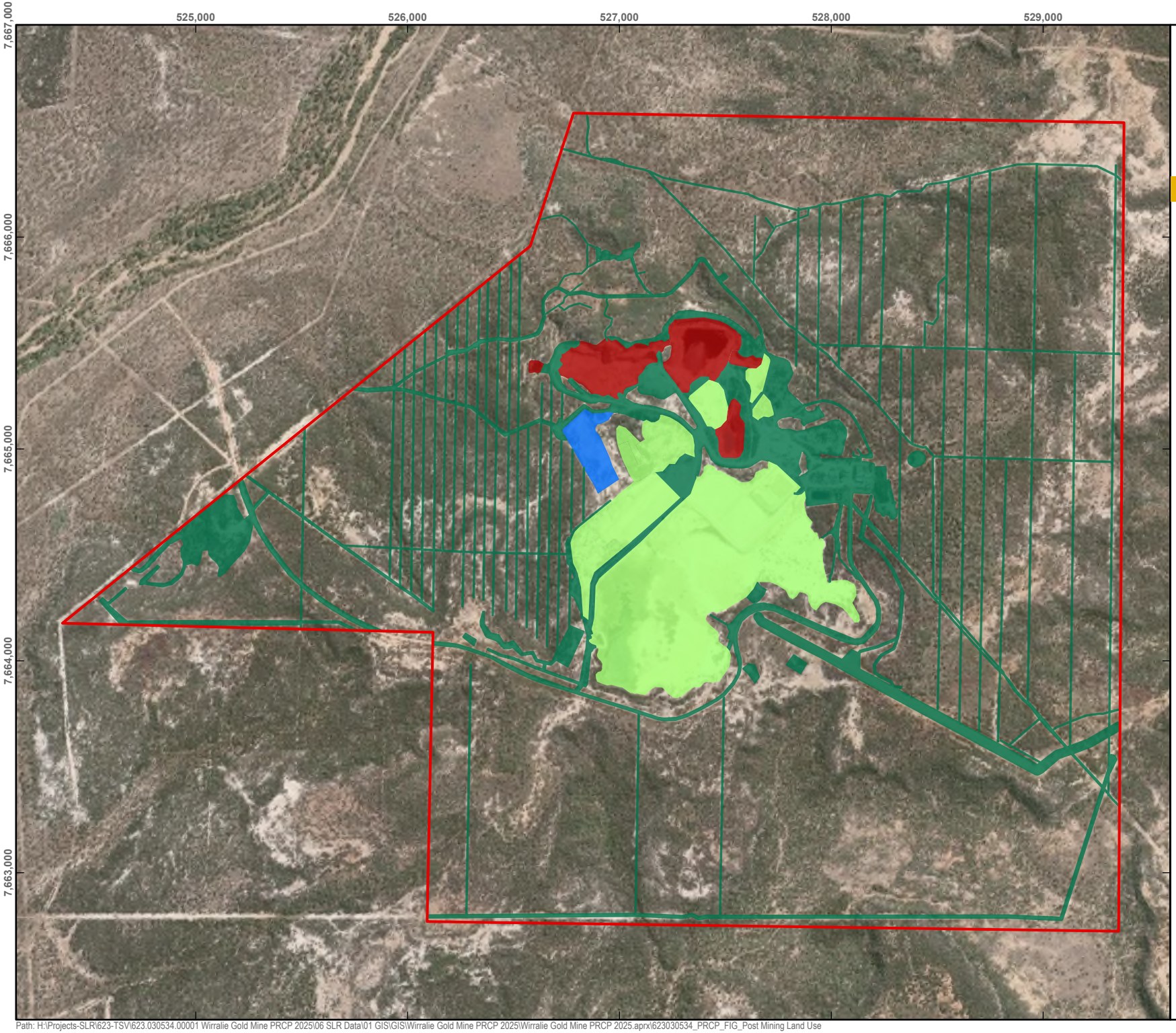
Grassland	Land that cannot support cattle grazing and where deep-rooted plants are to be avoided. This PMLU aims to reflect pre-mining grassy open areas while also avoiding seeding of deep-rooted trees/shrubs which could compromise the performance of the WRD cover system. Grassland PMLU will not be grazed. This PMLU meets the requirement of Table F1 of the EA	• Waste Rock Dumps • TSF/heap leach

Table 3-3 describes how the PMLU's meet the requirements of the EP Regulation.

Table 3-3 Requirements of a PMLU

Requirements of the PMLU	Justification
The land is safe and structurally stable	Where required, final landforms will be shaped to ensure long term stability. After initial rehabilitation, structures will continue to be monitored by suitably qualified persons to assess stability over time. The remaining areas will have minor reshaping to establish drainage and prevent erosion. Fencing will be constructed to prevent cattle ingress to the TSF whilst vegetation establishes.
There is no environmental harm being caused by anything on or in the land	All contaminants will be removed from domains and either encapsulated within the TSF or removed from site. A contaminated land assessment will be conducted at specified domains following rehabilitation activities to verify the removal of contaminants. All infrastructure and waste will be removed from site during the demolition phase of rehabilitation. The site will be revegetated to reduce the possibility of erosion. Ongoing surface and groundwater monitoring will be conducted to assess the potential for environmental harm.
The land can sustain a PMLU	The proposed PMLUs of 'Low intensity grazing' and 'Grassland' are consistent with surrounding land uses.
The PMLU is viable having regard to the use of land in the surrounding region	The surrounding area is a significant beef producing region. The proposed PMLU of 'low intensity grazing' is consistent with previous and current land uses in the area. The Run-off Dam has a PMLU of 'water storage' and will remain as a water source for stock, consistent with the surrounding proposed PMLU.
The PMLU satisfies at least one of the following: a) the use is consistent with how the land was used before a mining activity was carried out on the land	The proposed PMLUs of 'Low intensity grazing' and 'Grassland' are consistent with how the land was used before mining was carried out on the land.

b) the use is consistent with a development approval relating to the land – c) the use is consistent with a use of the land, other than a use that is mining, permitted under a State or Commonwealth Act, including, for example, a planning instrument under the Planning Act 2016 d) the use will deliver, or is aimed at delivering, a beneficial environmental outcome	



WIRRALIE GOLD MINE PROGRESSIVE REHABILITATION AND CLOSURE PLAN

POST MINING LAND USE

FIGURE 3-1

LEGEND

- Mining Lease
- NUMA

Post Mining Land Use

- Water Storage
- Low Intensity Grazing
- Grassland

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
Drawn by:	AS

Path: H:\Projects-SLR\623-TSV\623.030534.00001 Wirralie Gold Mine PRCP 2025\06 SLR Data\01 GIS\GIS\Wirralie Gold Mine PRCP 2025\Wirralie Gold Mine PRCP 2025.aprx\623030534_PRCP_FIG_Post Mining Land Use

3.3 Community Consultation

Section 126C of the EP Act requires the PRCP to state the extent to which the PMLU is consistent with the outcomes of consultation within the community. The PMLU is consistent with the surrounding area and therefore anticipated to be consistent with community expectations. This PMLU has also been consulted and discussed with DETSI in pre-lodgement meetings and has shown support. Given that the PMLU is in accordance with the local planning scheme it is assumed that local council would be supportive.

The proposed PMLUs of grazing on native pasture and water storage are:

- Consistent with the land use prior to the commencement of mining activities;
- Consistent with the surrounding land use; and
- Compatible with, and beneficial to, the current underlying landholder activities.

3.4 Planning Scheme

Under the Whitsunday Planning Scheme 2017, the Project is located in a 'rural' zone, which includes cropping, intensive horticulture, intensive animal industries, animal husbandry, animal keeping and other primary production activities (Whitsunday Regional Council, 2017). The outcomes for the rural zone include:

- Development provides for a broad range of Rural activities, including animal husbandry, cropping, roadside stalls and wholesale nurseries, animal keeping, aquaculture, intensive animal industry, intensive horticulture and rural industry, provided that adverse environmental and amenity impacts are avoided or appropriately managed;
- Permanent Accommodation activities are limited to dwelling houses and caretaker's accommodation on existing lots. Home based businesses, nature-based tourism, rural workers accommodation and tourist parks may also be established where the scale, intensity and nature of the use complements Rural activities and promotes the sustainable use of rural land;
- Business, Industry and Community activities that are compatible with a rural setting and support rural enterprise and community wellbeing are facilitated where they do not compromise the use of the land for Rural activities. Such uses include agricultural supply stores, veterinary services, bulk landscaping supplies, community uses and emergency services;
- Non-rural activities are located, designed and operated to minimise conflicts with existing and future Rural activities on the surrounding rural lands;
- Intensive Rural activities are not located adjacent to sensitive uses and are designed and operated to maintain the rural character and amenity of the zone;
- Development encourages the continued operation of existing agri-business and continued development of new agri-business opportunities;
- Development for extractive industry is appropriately designed, operated and managed to minimise significant nuisance and environmental impacts on surrounding premises;
- Development does not alienate or fragment agricultural land unless:
    - There is an overriding need for the development in terms of public benefit; and
    - No other site is suitable for the particular purpose;

- The built form of development in the zone integrates with and complements the predominant rural character and scale of the zone and sensitively responds to the environmental and topographical features of the landscape;
- Development avoids or mitigates any adverse impacts on areas of cultural heritage significance or environmental significance (including creeks, gullies, waterways, wetlands, coastal areas, habitats and vegetation) through sensitive location, design, operation and management;
- Development is provided with an appropriate level of services and infrastructure that maintains public health, avoids negative impacts on the natural environment and ensures the safety of buildings and works;
- Development is located and designed to maximise the efficient extension and safe operation of infrastructure; and
- The safety and efficiency of existing and future infrastructure (including road, rail, telecommunications and electrical infrastructure) is protected and the amenity and safety of development is not adversely affected by proximity to such infrastructure (Whitsunday Regional Council, 2017).

The proposed PMLUs are consistent with the outcomes defined in the Whitsunday Planning Scheme 2017.

3.5 Final Milestone Criteria

Final Milestone Criteria are provided in **Table 9-2** of this report.

4.0 Non-use Management Areas

A Non-use Management Area (NUMA) is defined in section 112 of the EP Act as an area of land the subject of a PRCP that cannot be rehabilitated to a stable condition after all relevant activities for the PRCP carried out on the land have ended. A NUMA can only be proposed due to one of the following reasons:

a) Carrying out rehabilitation of the land would cause greater risk of environmental harm than not carrying out the rehabilitation; or

b) Both of the following apply:

   i. The risk of environmental harm as a result of not carrying out rehabilitation of the land is confined to the area of the relevant resource tenure; and

   ii. The applicant considers, having regard to each public interest consideration, that it is in the public interest for the land not to be rehabilitated to a stable condition.

Under the transitional provisions of the EP Act, existing approved NUMAs are able to be transitioned into the PRCP without further assessment or public notification. Existing approvals must be included in a land outcome document.

Pit A, Pit B, North Pit, Deep Lead Pit and the Blinky Pit are designated NUMAs with the final outcome being residual voids. The five final voids are described in the EA and have been transitioned into this PRC Plan and PRCP Schedule.

Consistent with the process outlined in the PRCP Guideline, the Project is not required to comply with the requirements under section 126C(1)(g) or (h), or section 126D(2) or (3) of the EP Act and is not required to complete the information requirements under section 126C(1)(j) of the EP Act for the approved NUMAs.

There have been no changes to the final voids compared to the approved layout in the EA. The area and crest elevation for the improvement areas is listed in **Table 4-1**.

Table 4-1 NUMAs at WGM

Residual Void	Area (ha)	Pit Crest Elevation (mAHD)
Pit A	9.0	250.0
North Pit	0.9	250.0
Blinky Pit	0.4	251.0
Deep Lead Pit	2.8	255.0
Pit B	9.2	271.0
Total	**22.2**	

4.1 Voids in Floodplains

This does not apply to transitional PRCPs where NUMAs are pre-approved.

4.2 Achieving Sufficient Improvement

A NUMA is to be managed in accordance with best practice management strategies whilst minimising risks to the environment, in doing so, 'sufficient improvement' to the void can be achieved prior to relinquishment of the lease. Sufficient improvement may be achieved when:

- The risk of the area collapsing, eroding, or subsiding is minimised;
- The need to actively manage the area is minimised; and
- Measures are implemented to minimise fauna and persons access to the area (i.e., fencing).

The final voids for the pits (**Figure 3-1**) will be left in safe condition with stock exclusion fences, and 2 m high abandonment bunds constructed around the perimeter of each pit.

4.3 Community Consultation

The five final voids are described in the EA and have been transitioned into this PRC Plan and PRCP Schedule. The land outcomes have been publicly available in the EA and the proposed PMLUs and NUMAs in this PRCP are substantially similar.

4.4 Planning Scheme

The proposed NUMAs are consistent with the outcomes defined in the Whitsunday Planning Scheme 2017 as detailed in **Section 3.4**.

4.5 Final Milestone Criteria

Management milestones have been developed to demonstrate sufficient improvement (**Table 9-2)**.

5.0 Community Consultation

5.1 Community Profile

Mount Coolon is the nearest town, located 30 km to the south of WGM. As of the 2021 Census, the population was 172, with 80.1 % male, and 19.9 % female. The largest employment industry is construction followed by agriculture, forestry, and fishing.

WGM is an owner-operated mine, with approximately 10 staff, the majority of which work a 15:6 Drive in Drive Out (DIDO) roster from Townsville, Cairns, or Mackay. WGM presents an employment opportunity for locals, as well as potentially boosting local economy through increased demand for basic amenities (food supply, fuel supply, etc.), and increased traffic through the region by DIDO workers.

Mackay is the nearest regional centre, located approximately 200 km east of WGM with a population of 121,691, and an unemployment rate of 4 % (Census 2021). Due to the small work force and Mackay being a reasonably sized city, it can be expected that WGM has little to no impact on employment demographics for the region.

5.2 Community Consultation Register

Potentially affected community stakeholders are detailed in **Table 5-1**. Solomons Gold maintain a community consultation register (**Table 5-2**) which records community interaction, including:

- Details of each community member;
- When the consultation occurred;
- Records of all previous engagements with the community;
- Type of consultation;
- Information provided;
- Issues raised;
- How issues consideration where considered in decision-making; and
- Commitments.

The register will continue to be updated during operations, to ensure all relevant communication is captured.

Table 5-1 Community Stakeholders

Community Stakeholder	Details	Potential Issues
Relevant Community Stakeholders		
Wirralie Station	WGM is on Wirralie Station. Land within the ML is used for grazing. Compensation Agreements are in place between Solomons Gold and Wirralie Station	• Access to agistment land under Wirralie MLs not required for mining. • Future access to land covered by the ML. • Rehabilitation outcomes. • Environmental issues and • Management.

		• Water access.
Traditional owners	The Jangga people are the traditional owners of the land on which Wirralie is situated. During 2012 a Native Title claim for the region was implemented (Fed Court NoQUD6230/1998).	• Cultural heritage impacts. • Environmental impact and management. • PMLU. • Impacts on Native Title.
Utility owners: • Department of Transport and Main Roads; and • Ergon Energy.	Department of Transport and Main Roads, and Ergon Energy own assets within or adjacent to Wirralie (Rutherford Road). Solomons Gold engage with utility owners on an as needs basis. The PRCP will not require an update to any agreements.	• Rehabilitation and impacts to assets. • Disruption of access to assets. • Impacts to asset value.
Local Government	Whitsunday Regional Council is the local government for the LGA Wirralie is situated within.	• Local opportunities. • Economic and community sustainability. • Environmental impact and management. • Effects on Council assets. • Mine rehabilitation. • PMLU. • Compliance with the Whitsunday Regional Council Planning Scheme.
Other stakeholders		
Nearby Landowners	There are four other properties surrounding Wirralie including Pyramid, Bungobine, Olderfleet and Ill L Ra Stations. Solomons Gold has means to provide correspondence with the surrounding landholders on an as needs basis.	• Future access to land covered by the ML. • Rehabilitation outcomes. • Environmental issues and Management. • Potential water access.
Solomons Gold Employees	All Solomons Gold personnel are expected to be interested in closure planning where it may be thought to impact employment security.	• Job retention. • Loss of jobs with closure. • Living conditions.
Community members and group	Affiliated communities' members and organisations of the Mt Coolon region.	• Job opportunities. • Job retention. • Loss of jobs with closure. • Environmental impact and management. • PMLU. • Rehabilitation.
Queensland Government	Government organisations with invested interest in Wirralie including: • Department of Resources. • DETSI.	• Resource development. • Job opportunities. • Job retention.

	• Whitsunday Regional Council. • Mayors and Councillors of Whitsunday Regional Council. • Electorate member for Burdekin. • Minister for Natural Resources, Mines and Energy. • Minister for the Environment and the Great Barrier Reef and Minister for Science and Youth Affairs.	• Environmental impacts and management. • Rehabilitation cost. • Environmental risk. • PMLU.
Federal Government	Department of Agriculture Water and Environment (DAWE)	• Resource development. • Job opportunities. • Job retention. • Environmental impacts and management. • Rehabilitation cost. • Environmental risk. • PMLU.

Table 5-2 Community Consultation Register

Consultation Date	Community Member	Consultation Type	Information Provided	Issues raised by Community	How issues were Considered	Decisions/ Outcomes	Commitments
01/09/2020	DETSI	Email	Transition to PRCP kick off discussion	None	N/A	Future teleconference to be had to discuss timeframes	None
30/10/2020	DETSI	Teleconference	Initial discussions regarding PRCP transition timeframes	None	N/A	Proposed transition timeframes to be provided	None
16/11/2020	DETSI	Letter	Proposed PRCP transition timeframes	None	N/A	Proposed PRCP transition timeframes provided	Draft PRCP – 30/09/2021 Final 31 December 2021
05/01/2022	DETSI	Letter	Submission of PRCP to DETSI	None	N/A	PRCP Submitted	N/A
20/01/2022	DETSI	Letter	PRCP not properly made Notice issued	None	None	Response to Not Properly Made Notice due by 14 July 2022	Response to Not Properly Made Notice date set.
26/02/2025	DETSI	Meeting in Cairns	Run through on outstanding RFI items and request for extension	None	N/A	Timeframe extension granted	Commitment to provide updated PRCP within agreed timeframe
15/01/2026	DETSI	Meeting in Cairns	EA Amendment discussion and update on PRCP progress	None	N/A	N/A	None

5.2.1 Ongoing Consultation

Ongoing communication between the community and Solomons gold is to continue under the Wirralie Community Consultation Plan. The plan details the communication processes followed to ensure ongoing positive communication between stakeholders and Solomons Gold. The Community Consultation Plan is detailed in **Appendix C**.

5.2.2 Native Title

The WGM predates Native Title claims and thus is not applicable to the site. The Native Title claimants of the land surrounding WGM is the Jangga People (QCD2012/009).

6.0 Rehabilitation and Management Methodology

6.1 Final Landform Design

Under Section s111A of the *Environmental Protection Act 1994* (Qld) (EP Act) rehabilitated land must comply with the following conditions:

Land is in a ***stable condition*** if –

- The land is safe and structurally stable;
- There is no environmental harm being caused by anything on or in the land; and
- The land can sustain a PMLU.

6.1.1 Landform Design Criteria

Landform design and planning considers four main components:

- Landform stability;
- Erosion minimisation;
- Landform compatibility with the surrounding environment having regard to the landscape; and
- PMLU criteria.

6.1.2 Landform Structures

The final landform designs will be refined closer to closure, utilising information gathered over the course of operations. This includes the results of ongoing geochemical analysis of tailings, surveys, and environmental monitoring results.

Landform structures for the PMLUs and NUMA of WGM are detailed respectively in **Table 6-1**.

Table 6-1 Landform Structures for PMLU and NUMAs of WGM

RA/ IA	Domains	Area (ha)	Landform Design
RA1	Infrastructure areas, roads and tracks, airstrip, stockpiles, historic village, magazine, raw water pond, evap. pond, cleared areas	121.4	• Infrastructure is to be decommissioned and removed from site. Access tracks, fence lines and hardstands required for the PMLU to be retained. • Contaminated land (if any) is to be removed and disposed of in the TSF. • Landform to be shaped with subsoil to become free draining, where needed. • Topsoil will be spread and ripped parallel to the contour to promote vegetation strike. • Landform will be seeded with pasture species. • Domain to be monitored for rehabilitation success.
RA2	ROM pad, Processing plant	3.3	• Infrastructure is to be decommissioned and removed from site. Access tracks, fence lines and hardstands required for the PMLU to be retained. • Contaminated land (if any) is to be removed and disposed of in the TSF.

			• Landform to be shaped with subsoil to become free draining, where needed. • 0.15 m of topsoil will be applied. • Topsoil will be ripped parallel to the contour to promote vegetation strike. • Landform to be seeded. • Domain to be monitored for rehabilitation success.
RA3	WRDs	24.1	• Landform to be shaped to design criteria and be free draining. • Bunds to be installed at crest of WRDs to prevent downslope flow of runoff. • Batters are ≤ 15% slope. • West WRD (west face) has 10 m bench every 50 m. • West WRD (other faces) and WRD3: has 10 m flat bench every 18 m. • Topsoil will be applied to bring the domain to final landform elevation. • Topsoil will be ripped parallel to the contour to promote vegetation strike. • Landform to be seeded. • Domain to be monitored for rehabilitation success.
RA4	Tailings Dam and Heap Leach	73.6	• TSF to be filled until the design capacity is reached. • TSF and Heap Leach to be covered with 1 m waste rock then 0.15 m topsoil. • Landform to be shaped to be free draining. • Topsoil will be ripped parallel to the contour to promote vegetation strike. • Landform to be seeded. • Domain to be monitored for rehabilitation success.
RA5	Water Storage	5.4	• All associated infrastructure is to be removed from the domain. • Dam to be desilted.
IA1	Pit A, Pit B, North Pit , Deep Lead Pit and Blinky Pit	22.2	• Residual voids to be stabilised by securing the highwalls to ensure a safe, stable landform. • Bunding/ fencing and signage installed around the open cut to prevent ingress.

Final landforms have been determined based on the final land uses. Due to the majority of the PMLUs for WGM being ‘Low Intensity Grazing’ and ‘Grassland’, rehabilitation of WGM will incorporate pasture species in order to meet these requirements.

Final landforms will be designed and built to be both geochemically and geotechnically stable. These structures will be resistant to weathering, oxidation, and will not generate seepage, or leach contaminants to surface water or groundwater. Design also includes consideration to minimise or, where possible, eliminate potential impact to the environment.

Design plans will be finalised, taking into consideration:

- Modelling of the long-term stability of the final landform;
- Methods of construction;
- QAQC requirements;
- Trial methodology to verify the predicted success of rehabilitation; and
- Limitations and assumptions of the landform design.

6.1.3 Landform Construction

6.1.3.1 WRDs

On closure, waste rock and other materials at the overburden dumps and piles will be reshaped to a low-gradient landform, reflecting the surrounding environment. Elements of WRD rehabilitation design, including slopes and benches, have been conceptually designed to produce a safe and erosionally stable landform with no rill erosion deeper than 0.3 m.

Table 6-2 WRD landform design (Appendix L)

Mine Feature	Landform Design
WRD1 and WRD 2	• Bund at crest to prevent downslope flow • Batters ≤ 15% • Flat benches
North WRD	• Batters ≤ 15% • ≥ 70% ground cover
West WRD – west face	• 10 m bench every 50 m
West WRD and WRD3	• Bund at crest to prevent downslope flow • 10 m flat bench every 18 m Batters ≤ 15%
Former ROM	• Bund at crest to prevent downslope flow • 10 m flat bench every 15 m at Batters ≤ 15%

The rehabilitation will include reshaping, topsoil, and revegetating. Surface water management will continue during rehabilitation to convey runoff and minimise the potential for erosion and weathering.

The design, management, and rehabilitation phases enable the ability for the overburden dumps to remain safe, structurally stable, and non-polluting during the life of mine. The final landforms will be assessed by a suitably qualified person during rehabilitation efforts to confirm it is stable and non-polluting.

6.1.3.2 Tailings Storage Facility

As the TSF is required during mining operations, rehabilitation will be undertaken once mining is finished.

During operation the TSF will continue to be filled until the design capacity is reached. A cover will be constructed using waste rock material (1.0 m) to provide a working layer with topsoil (0.15 m) layered on top to bring the domain to the final landform shape and elevation. Each layer will be shaped to follow the natural landscape and to be free draining. The topsoil will be ripped and seeded with appropriate species. The final landforms will be assessed by a suitably qualified

person during rehabilitation efforts to assure it is stable and non-polluting along with required monitoring.

Rehabilitation of the TSF will be timed to begin slightly later than the adjacent WRD3 as the waste rock material for the TSF capping will be sourced from the WRD.

6.1.4 Quality Assurance

Construction management, technical supervision, and QA/QC of final landforms will be done by an AQP, to ensure that construction aligns with the design plan. An AQP will prepare a QA/QC document to verify landform design is stable and has been constructed in accordance with the design plan.

6.2 Hydrogeology

A hydrogeological assessment has been prepared by HydroElement Solutions (2026) to address the hydrogeological assessment requirements of the PRCP (**Appendix H**). The assessment focuses on the prediction of post-closure pit lake behaviour, including equilibrium water levels, groundwater inflow, and the interaction between pit voids and the surrounding groundwater system. Analytical inflow estimation methods and site-specific water balance modelling have been applied to determine whether the final voids will function as groundwater sinks or sources under closure conditions.

6.2.1 Hydrogeological Conceptual Model

To conceptualise the groundwater flow system at Wirralie, available data including topography, geological interpretation, site infrastructure, and groundwater level measurements were compiled to develop interpretative hydrogeological cross sections. Two representative transects were prepared: a west to east section (**Figure 6-1**) and a north to south section (**Figure 6-2**).

The west to east cross section follows the alignment of Sugarbag Creek from the western mining lease boundary towards monitoring bore WTB05. The transect then trends northeast through Pit B before extending eastward to intersect Pit A and North Pit, capturing the primary pit void system and its relationship to local drainage features.

The north to south cross section extends from the northern mining lease boundary southwards past monitoring location WTB06 (located approximately 100 m off the section alignment), and continues through Pit A, WRD2, and WTB04. From WTB04, the transect trends southwest through the heap leach pad and tailings storage facility, passing monitoring locations WTB07 and WTB08 before terminating at the southern mining lease boundary. This section captures the relationship between key mine infrastructure, waste landforms, and groundwater monitoring locations across the site.

Surface elevations in the cross sections are based on the 2023 LiDAR dataset with approximately 1 m resolution. These elevations are combined with interpreted geological units derived from available drilling and mapping data. The extent of weathering is illustrated using a grey overlay, which visually darkens the underlying lithology to represent the transition from fresh to weathered rock.

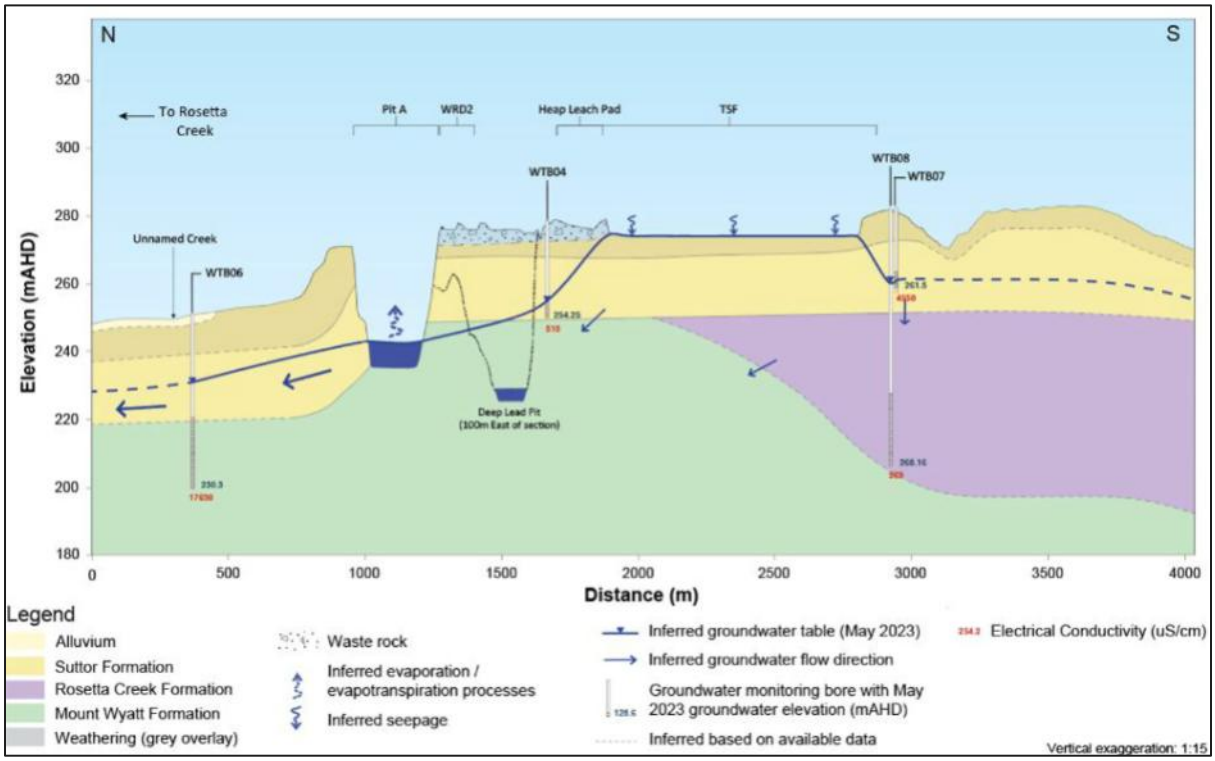


Figure 6-1 North to South Cross-section (Appendix H)

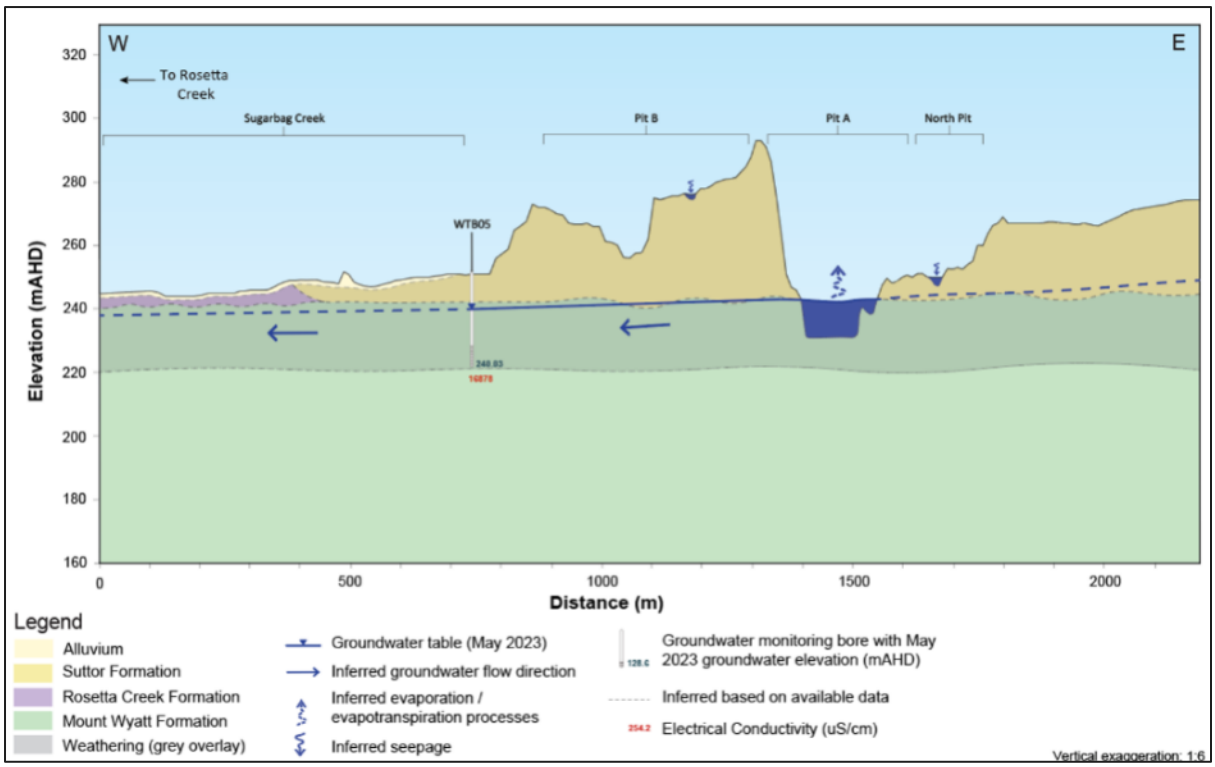


Figure 6-2 West to East Cross-section (Appendix H)

6.2.2 Groundwater Distribution and Flow

Groundwater occurrence at Wirralie is controlled by a sequence of weathered and fractured bedrock units overlain by minor unconsolidated sediments. The principal hydrostratigraphic units are:

- Mount Wyatt Formation
- Rosetta Creek Formation
- Suttor Formation
- Minor colluvial and alluvial deposits.

Slug testing was successfully completed in bores screened within the Mount Wyatt Formation, with limited data available for other units due to low permeability conditions or bore constraints (**Appendix H**). Hydraulic conductivity values for the Mount Wyatt Formation range from approximately 0.008 to 1.1 m/day, indicating moderate permeability associated with fractured and weathered volcanic rock. These values are consistent with published ranges for fractured igneous and volcanic units (**Appendix H**).

The Suttor Formation is interpreted to have significantly lower permeability, based on limited testing and slow recovery responses observed during field investigations. The Rosetta Creek Formation is expected to exhibit variable hydraulic conductivity depending on lithology, with permeability controlled by the relative proportions of sandstone, conglomerate, and clay-rich material.

Overall, the hydraulic regime at the site is characterised by:

- moderate permeability within fractured bedrock units
- lower permeability within clay-rich and less fractured units
- strong heterogeneity associated with weathering and structural features

Groundwater levels are generally greater than 20 m below ground level across the site, with shallower water levels of approximately 10 m below ground level observed locally at bore WTB05. Temporal fluctuations of up to approximately 5 m are observed; however, groundwater levels are generally stable over time, with no consistent long-term or seasonal trends evident across the monitoring network.

The absence of clear seasonal or long-term trends, despite periods of above-average rainfall, indicates that groundwater recharge is limited and occurs slowly. This behaviour is consistent with the climatic conditions at the site, which are characterised by high evaporation and low effective rainfall, as well as the relatively low to moderate hydraulic conductivity of the hydrostratigraphic units.

The potentiometric surface indicates that groundwater flow is controlled by topography, with flow generally directed towards lower elevation areas associated with local drainage systems (**Figure 6-3**). Pit A and Deep Lead Pit are interpreted to be hydraulically connected to the groundwater system, whereas water bodies within North Pit and Pit B are interpreted to be perched above the regional water table.

Overall, groundwater conditions at the site are characterised by:

- relatively deep water levels
- limited and diffuse recharge
- low hydraulic gradients

- stable groundwater conditions with minimal temporal variability

These characteristics indicate a low-energy groundwater system, with groundwater movement controlled primarily by topography and fracture permeability and are consistent with conditions where evaporative processes dominate over recharge. This has important implications for pit void behaviour, particularly in relation to the development of groundwater sinks at closure (**Appendix H**).

6.2.3 Groundwater Velocity

Groundwater flow velocity within the Mount Wyatt Formation was estimated using Darcy's Law, based on hydraulic gradients calculated between monitoring bores WTB05 and WTB06 (**Appendix H**). These bores are screened within the same hydrostratigraphic unit and are approximately aligned along an interpreted groundwater flow path, making them suitable for first-order velocity estimation.

Based on these assumptions, estimated average linear groundwater velocities within the Mount Wyatt Formation range from approximately 2.1 m/year to 69 m/year (**Table 6-3**). These velocity estimates provide an indication of the potential rate of groundwater movement within the fractured rock aquifer.

Table 6-3 Groundwater Velocity Estimates

Up-gradient bore	Up-gradient head (mAHD)	Down-gradient bore	Down-gradient head (mAHD)	dh/dl (m/m)	dh/dl as a ratio (1 to m)	K (m/d)	(K) comment	Vmin if ne = 5% (m/yr)	Vmax if ne = 15% (m/yr)
WTB05	240.03	WTB06	230.30	0.009	116	0.008	Min (based on field tests)	2.1	6.3
						1.1	Max (based on field tests)	23	69

Notes:

Horizontal and vertical distance between bore screens used for calculation of dh/d.

Head = groundwater level.

mAHD = metres Australian Height Datum.

m/d = metres per day.

K = hydraulic conductivity

dh/dl = hydraulic gradient.

ne = effective porosity, assumed to be 5% to 15%.

v = average linear velocity (Darcy velocity).

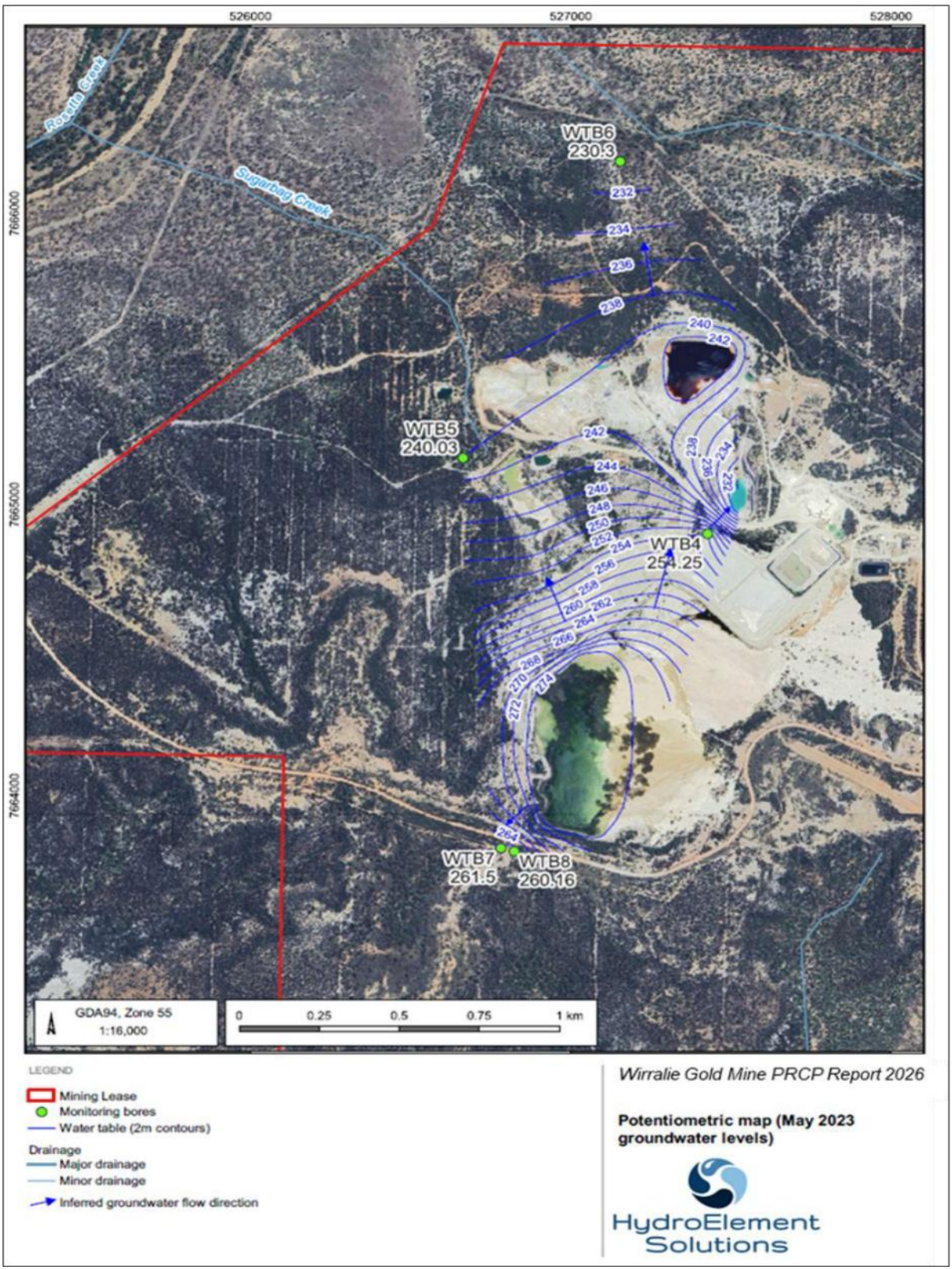


Figure 6-3 Potentiometric Map using Groundwater Level (Appendix H)

6.2.4 Recharge and Discharge

Groundwater recharge at Wirralie is limited and occurs primarily in response to episodic, high-intensity rainfall events. Recharge is most likely to occur within unconsolidated colluvial and alluvial sediments and within the weathered zones of the Suttor Formation, where infiltration is facilitated by higher permeability and surface exposure (**Appendix H**).

Recharge to the deeper Mount Wyatt Formation and Rosetta Creek Formation is inferred to occur indirectly via downward percolation from overlying units, lateral seepage, and preferential flow pathways associated with fractures and structural features. Overall, recharge is interpreted to be diffuse, limited, and controlled by climatic conditions and geological structure.

Groundwater discharge at the site is dominated by evaporation and subsurface through-flow within the hydrostratigraphic units. Vertical leakage between units is also likely, with groundwater moving from higher permeability units into lower permeability units or deeper formations. Within the Mount Wyatt Formation, groundwater discharge is expected to be controlled by fracture networks and structural features, which facilitate preferential flow.

Based on the relative elevation of groundwater levels and surface water features, there is no evidence of groundwater discharge to surface water systems (i.e. no baseflow contribution). This is consistent with the absence of springs in the area and indicates that surface water systems are not sustained by groundwater inputs.

6.2.5 Groundwater Chemistry

Groundwater pH across the monitoring network ranges from approximately 3 to 8. Groundwater in bores WTB06, WTB07, and WTB08 is generally circum-neutral to slightly acidic, which is within the range reasonably expected for groundwater in the region. In contrast, groundwater in WTB04 is acidic and groundwater in WTB05 is very acidic. These low pH values are not fully consistent with the 2021 waste rock characterisation results, which indicated that the sampled waste material generally had a low acid-forming potential. This apparent inconsistency may indicate that the sampled surface materials had already undergone oxidative leaching of sulfides prior to testing, or that other materials at site, including ore-related material not assessed in the waste rock study, have a greater acid-generating potential.

TDS in groundwater ranges from approximately 283 to 15,700 mg/L, indicating fresh to saline groundwater conditions across the site. Saline groundwater with TDS greater than 10,000 mg/L occurs in WTB05 and WTB06. Relatively fresh groundwater is present in WTB04 and WTB08, while brackish groundwater is generally present in WTB07. Sulfate concentrations show patterns that broadly align with TDS trends, indicating that sulfate contributes significantly to overall salinity. However, the groundwater chemistry does not indicate a single uniform hydrogeochemical process across the site.

Sulfate concentrations broadly correlate with TDS, indicating that salinity is influenced in part by sulfate. However, the relationship between pH and salinity is not consistent across the site, with both acidic and circum-neutral waters exhibiting elevated salinity.

Dissolved metals including cadmium, copper, lead, and zinc have been detected in groundwater at the site. The highest dissolved copper concentrations occur in WTB05, which also has the highest TDS, and in WTB04, which has the lowest pH. This suggests that elevated dissolved metal concentrations may be associated with both acidic conditions and saline groundwater conditions at WGM.

Overall, groundwater quality at Wirralie is spatially variable and reflects a combination of natural geochemical processes and likely localised influence from historical and current mining activities (**Table 6-4**).

Table 6-4 Wirralie Groundwater Quality Summary (Appendix H)

Bore ID	Analyte	pH	TDS	SO4	Ar	Cd	Cu	Fe	Pb	Mn	Mo	Se	Zn	Hg	Cyanide
	Units	pH units	gl/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	LoR			1	0.001	0.0001	0.001	0.05	0.001	0.001	0.001	0.01	0.005	0.0001	0.004
WTB04	Min	3.87	283	46	0.0005	0.00005	0.002	0.025	0.0005	0.641	0.0005	0.005	0.024	0.00005	0.002
	Median	4.62	416	72	0.0005	0.0001	0.007	0.025	0.0005	0.773	0.0005	0.005	0.121	0.00005	0.002
	Max	5.47	720	88	0.008	0.0003	0.027	0.2	0.0005	0.902	0.002	0.005	0.268	0.00005	0.002
	No. of samples	9	9	9	9	9	9	3	9	3	9	9	9	9	9
WTB05	Min	3.15	4810	1460	0.007	0.0043	0.015	0.26	0.002	6.76	0.0005	0.005	2.28	0.00005	0.002
	Median	3.65	11400	1660	0.01	0.0046	0.035	0.34	0.0065	6.86	0.0005	0.0075	3.105	0.00005	0.002
	Max	7.47	15500	1880	0.023	0.0054	0.651	0.5	0.036	7.27	0.0005	0.02	4.63	0.0101	0.002
	No. of samples	17	17	17	14	14	14	3	14	3	14	14	14	14	17
WTB06	Min	6.32	9860	1360	0.002	0.00005	0.0005	0.025	0.0005	2.18	0.002	0.005	0.0025	0.00005	0.002
	Median	6.76	13600	1950	0.003	0.0002	0.001	0.025	0.0005	4.14	0.004	0.005	0.00475	0.00005	0.002
	Max	7.9	15700	2130	0.005	0.0024	0.004	0.025	0.0005	8.42	0.013	0.005	0.192	0.00005	0.002
	No. of samples	17	17	17	14	14	14	3	14	3	14	14	14	14	17
WTB07	Min	6.37	2330	273	0.0005	0.00005	0.0005	0.025	0.0005	0.0005	0.003	0.005	0.0025	0.00005	0.002
	Median	6.725	2545	295.5	0.0005	0.00005	0.00075	0.025	0.0005	0.102	0.0035	0.005	0.0075	0.00005	0.002
	Max	7.46	2770	323	0.002	0.0003	0.001	0.025	0.0005	0.81	0.01	0.005	0.035	0.00005	0.002
	No. of samples	10	10	10	10	10	10	3	10	3	10	10	10	10	10
WTB08	Min	5.79	378	40	0.0005	0.00005	0.0005	0.025	0.0005	0.004	0.0005	0.005	0.0025	0.00005	0.002
	Median	6.77	594	43.5	0.0005	0.00005	0.0005	0.025	0.0005	0.015	0.001	0.005	0.0025	0.00005	0.002
	Max	7.45	676	62	0.0005	0.00005	0.017	0.025	0.0005	0.026	0.002	0.005	0.07	0.00005	0.002
	No. of samples	16	16	16	14	14	14	3	14	3	14	14	14	14	16

6.3 Flooding

Queensland Government's FloodCheck mapping service was used to estimate the regional flood extents adjacent to the Project. The flood mapping overlay includes regional flood data for the 1% AEP and Probable Maximum Flood (PMF) events. The flood mapping (**Figure 6-4** and **Figure 6-5**) demonstrate that the flood extents are well clear of the proposed site voids (ATCW, 2022). Further detail is provided in **Appendix D**.

The WGM voids are well above Rosetta Creek flood levels (~20 m from the PMF level to Pit A's spillway level), and well above Bungobine Creek PMF levels (~30 m from the PMF level to the southern mine extent). No other watercourses nearby to the mine site are considered major flow paths, and any other local watercourses such as the unnamed flow path to the north of the site are considered minor and not part of the regional floodplain. The WGM voids are therefore considered outside of the regional floodplain for all events up to and including the PMF event.

Bunding along the eastern extent of the voids will be maintained after closure, to divert the natural flow to the east away from the pits.

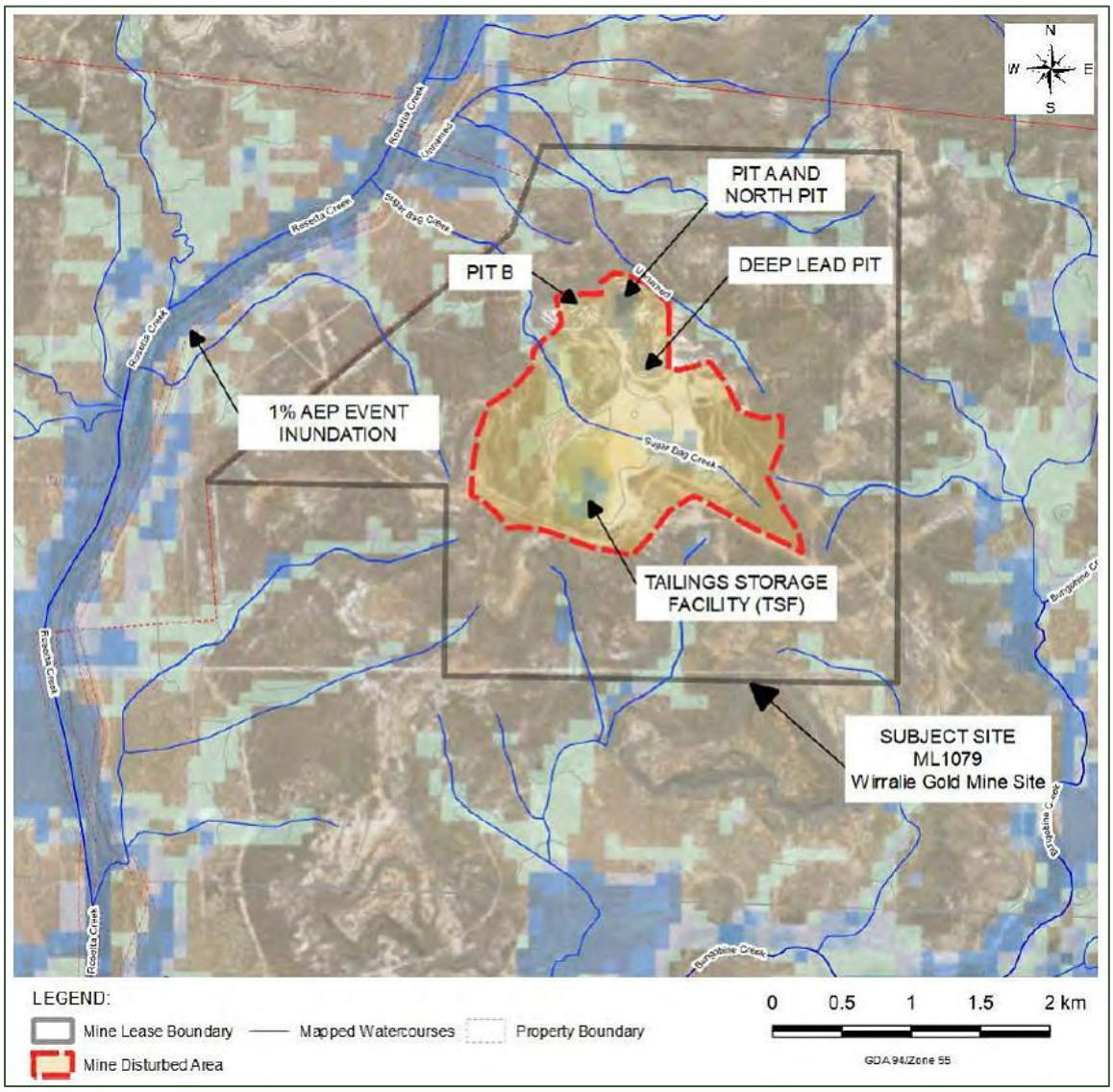


Figure 6-4 1% AEP Event Inundation (ATCW, 2022)

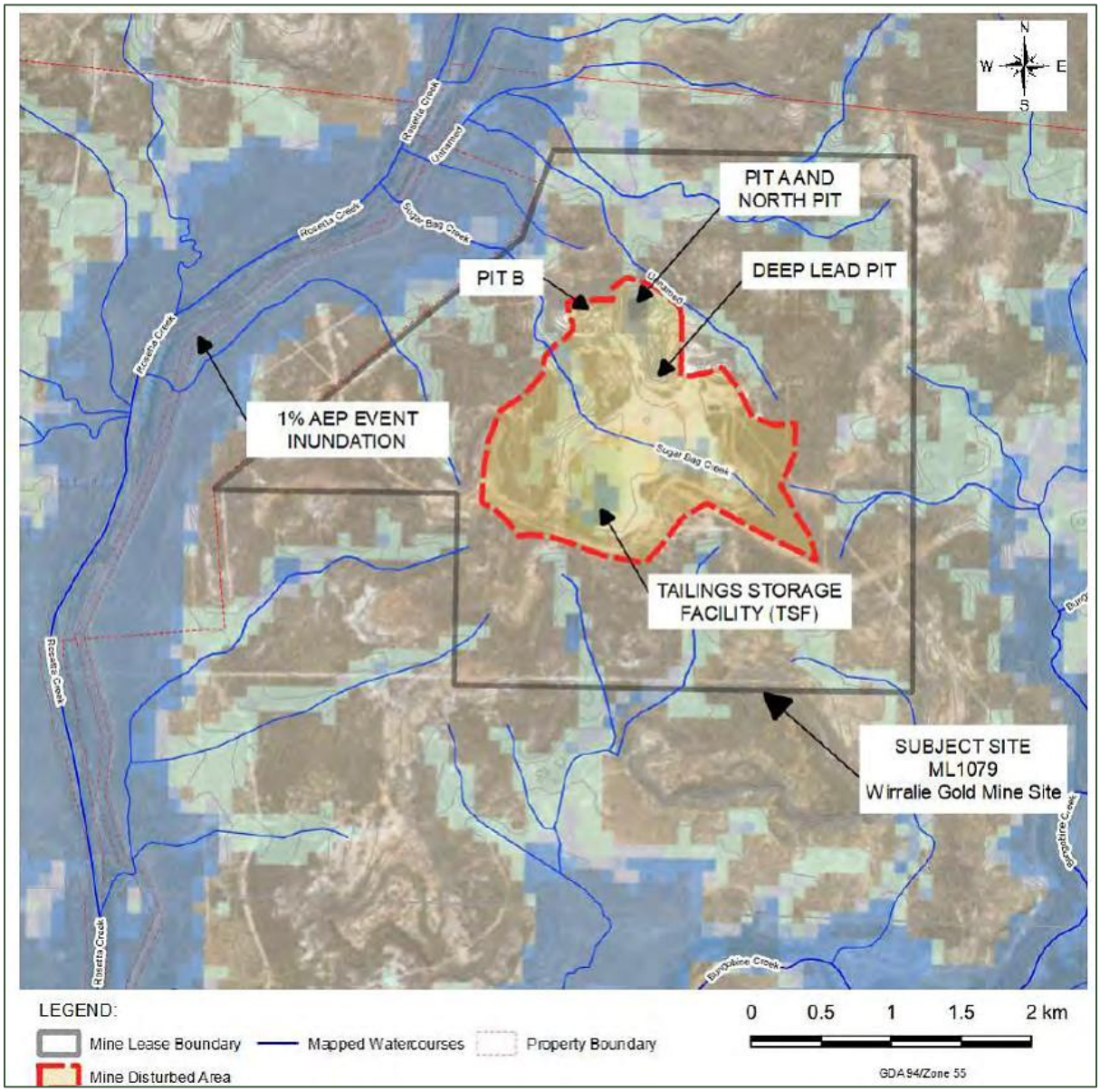


Figure 6-5 PMF Event Inundation (ATCW, 2022)

6.4 Soil and Capping Material Assessment

6.4.1 Waste Rock Balance

As discussed in **Section 6.6**, the waste rock material is considered low risk and suitable for rehabilitation activities.

Waste rock is to be used for:

- Working layer of TSF cap;
  - 1.0 m thickness; and
  - 736,000 m^3 required.
- Abandonment bund incorporated into perimeter of the voids.
  - 219,132 m^3 of waste rock required to construct the bunds.

Pit B has a waste rock volume of 3,636,766 m^3 available; 1,699,997 m^3 of material is required for rehabilitation of the above domains which gives a surplus of 1,936,769.5 m^3 which will remain in the WRDs as permanent features.

Table 6-5 Error! Reference source not found. details materials requirements for rehabilitation of the active TSF. Topsoil is discussed further in **Section 6.4.3**. Due to the low-risk nature of the tailings, no additional layers, such an impermeable layer, are proposed.

Table 6-5 Material balance requirements for capping and rehabilitating a low risk TSF.

Material	Layer thickness (m)	Volume required (m^3)	Volume available (m^3)	Source
Rock Cover	1.0	720,000	1,590,000	WRD
Topsoil	0.15	108,000	115,500	Site topsoil stockpiles

6.4.2 Soil Resources

As per **Section 2.3.5**, there are four soil map units across the WGM as described in **Table 6-6**.

Table 6-6 WGM Soil Types

Australian Soil Classification	Reference Site	Area (ha)	Area (%)
Eutrophic Brown Dermosol, Deep	S4	137.78	12.18
Leptic Brown Rudosol	S6	365.22	32.30
Leptic Brown-Orthic Tenosol, Shallow	S10	394.86	34.93
Sodic Brown Dermosol, Deep	S11	148.40	13.12
Self-Mulching Brown Vertosol	S14	84.15	7.44

6.4.2.1 Topsoil Stripping

Topsoil resources were identified as a part of the Soil and Land Suitability Assessment (**Section 2.3.4)**. Topsoil depths and volumes available for rehabilitation are detailed in **Table 6-7**.

Table 6-7 Topsoil Depths and Volumes

Soil Type	Area (m^2)	Stripping Depth (m)	Volume (m^3)
Undisturbed Soil Resource			
Eutrophic Brown Dermosol, Deep	1,377,800	1.10	1,515,580
Leptic Brown Rudosol	3,652,200	0.2	730,440
Leptic Brown-Orthic Tenosol, Shallow	3,948,600	0.5	1,974,300
Sodic Brown Dermosol, Deep	1,484,000	0.5	742,000
Self-Mulching Brown Vertosol	841,500	0.2	168,300
Stockpiled Resource			
N/A	32,866	N/A	65,732
Total			**5,169,352**

6.4.3 Topsoil Management

Topsoil management follows the below methodology:

- Topsoil salvage is maximised from areas proposed to be disturbed and are stockpiled separately from any salvaged subsoils;
- Topsoil stockpiles do not exceed 2m in height and are ripped and seeded with native species to protect the resource; and
- Where possible, stripped topsoil should be directly placed on areas of progressive rehabilitation in order to minimise mortality in the seedbank.

6.4.4 Topsoil Application

Where land is adequately prepared for rehabilitation, the application of topsoil will occur in essentially the reverse sequence to topsoil stripping. The process for the application of topsoil to WGM surfaces is as follows:

- Prior to recovered topsoil being applied to surfaces, Solomons will ensure that the amount of topsoil available for rehabilitation matches the amount of area requiring rehabilitation;
- Solomons Gold will ensure that the mining domain/area has been decommissioned (infrastructure removed);
- The landform is shaped to final landform design either using in-situ material or over-burden (non-acid forming), install appropriate erosion and sediment controls (ESCs) if needed;

- Landform will then be ripped. Ripping will occur via dozer with ripper attachment parallel to surface contours;
- Topsoil will be applied at a minimum depth of 0.15 m and ripped to promote vegetation; and
- After application, seeding with grass species to establish revegetation cover as early as possible.

6.5 Erosion

Erosion and sediment control measures will be carried out and documented using environmental inspection forms. Permanent erosion and sediment controls have been incorporated into the WGM design and are based off catchment characterisation.

Revegetation and ensuring success of revegetated areas will be implemented to minimise erosion and act as a sediment control, and ensure landforms are both geochemically and geophysically stable.

Effective erosion and sediment control structures are installed surrounding the site. The site runoff dam is the primary sediment control on WGM. Site affected water will continue to be directed to this structure.

Erosion and sediment control plans should be considered when conducting rehabilitation activities, and should include the following:

- Contours and drainage lines;
- Disturbance limits;
- Earthwork extents;
- Control measure locations;
- Order of work schedule;
- Construction details and notes; and
- Specific operating procedures.

6.5.1 Erosion Assessment

Erosion modelling using the Water Erosion Prediction Project (WEPP) model has been undertaken by Wulguru Technical Services (**Appendix L**). Erosion modelling of the proposed landforms includes:

- Waste rock dumps (WRD 1, 2, 3 and rehabilitated former WRDs);
- Tailings storage facility (TSF); and
- Former ROM.

Erosion modelling using WEPP was conducted on insitu landforms and proposed final landforms for a 100-year period. The modelling identified that some features had slopes resulting in rates of erosion above the target. The northern rehabilitated WRD and TSF contained slopes that provided for acceptable erosion rates, i.e. < 5 - 6 t/ha/yr.

Modifications to the benching and slope gradients were required for WRD1, WRD2, western rehabilitated WRD, WRD3 and the former ROM. Recommended modifications include:

- Prevention of runoff overtopping the crests;
- Reducing the proposed batter angle for WRD1 and WRD2
- Reshaping the western and northwestern faces of the western rehabilitated WRD and collocated WRD3 down to 15 % with benches at regular intervals acting as slope breaks;
- Benching of the former ROM to achieve final batters of 15 % at regular intervals with slope breaks.

WEPP modelling indicates that the final landforms, reshaped as per recommendations and rehabilitated using 0.15 m of rocky growth media will achieve the target erosion rate of 5 – 6 t/ha/yr.

These recommendations have been incorporated into the landform design criteria (see **Section 6.1.1**) and subsequently into the rehabilitation milestone criteria in the Schedule (**Table 9-2** and **Appendix M**).

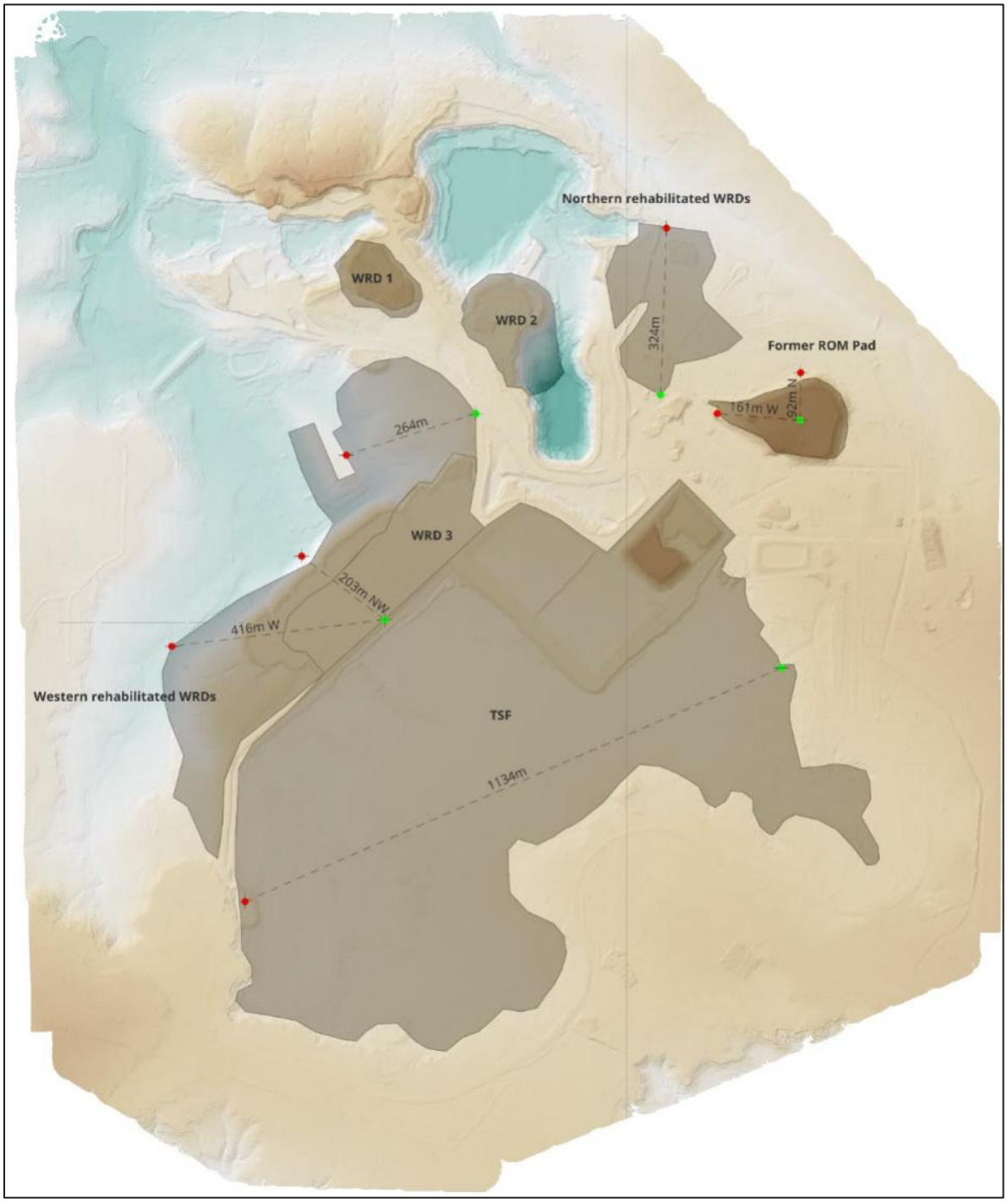


Figure 6-6 WEPP Slope Transects derived from 1 m DEM (Appendix L).

6.6 Waste Characterisation

A waste rock characterisation study has been completed including desktop review of all waste rock areas and the sampling of waste rock. The study was guided by the Australian technical guidelines for the geochemical assessment of mining wastes (DME, 1995). The study is presented in full in **Appendix G** and summarised below.

6.6.1 Methodology

A total of 155 rock/sediment samples were collected from 82 sampling locations across the Project, providing a good overall representation of the Project waste. The drillhole cuttings were obtained from the WRD, HLP, former ROM and haul road, whereas the crustal scoops and push-tube sediments were taken from the TSF. Sampling locations are summarised in **Table 6-8**.

Table 6-8 Sampling Summary

Sample Type	Area	Number of Samples
Drillhole cuttings	WRD01	11 (from 5 holes)
	WRD02	13 (from 8 holes)
	WRD03	29 (from 12 holes)
	Rehabilitated WRD	31 (from 16 holes)
	Former run-of-mine (ROM) pad	12 (from 5 holes)
	Heap leach pad (HLP)	7 (from 7 holes)
	Haul road	2 (from 2 holes)
Trowel scoops	Tailings surface facility (TSF)	23
Push-tube sediments	TSF	27

The geochemical test work was based on industry-recognised procedures for the geochemical characterisation and assessment on mine waste (AMIRA, 2002; The International Network for Acid Prevention [INAP], 2014; COA, 2016).

Static geochemical tests were conducted to provide information on the bulk geochemical characteristics of samples at a single point in time. All 155 samples underwent static geochemical testing to evaluate the risk associated with the potential oxidation of sulphides, acid generation, and the presence of metals/metalloids and salts. Static analysis included the following analytes:

- pH;
- Electrical conductivity;
- Moisture;
- Total sulphur;
- Acid neutralising capacity;
- Net acid generation capacity;
- Net acid producing potential; and
- Total metals/metalloids (Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Se, V, Zn).

Kinetic leach column (KLC) tests were also conducted on 11 samples to evaluate the risk associated with dissolution and mobility of metals/metalloids and salts, over a period of time.

6.6.2 Geochemical Analysis Results

The majority of samples analysed were deemed to be in the slightly acidic range which is indicative of the Project's volcaniclastic/intermediate volcanic geology. The exception to this was identified within the tailings sediment samples, which recorded minor amounts of strongly acidic samples. pH analysis results are displayed in **Figure 6-7**.

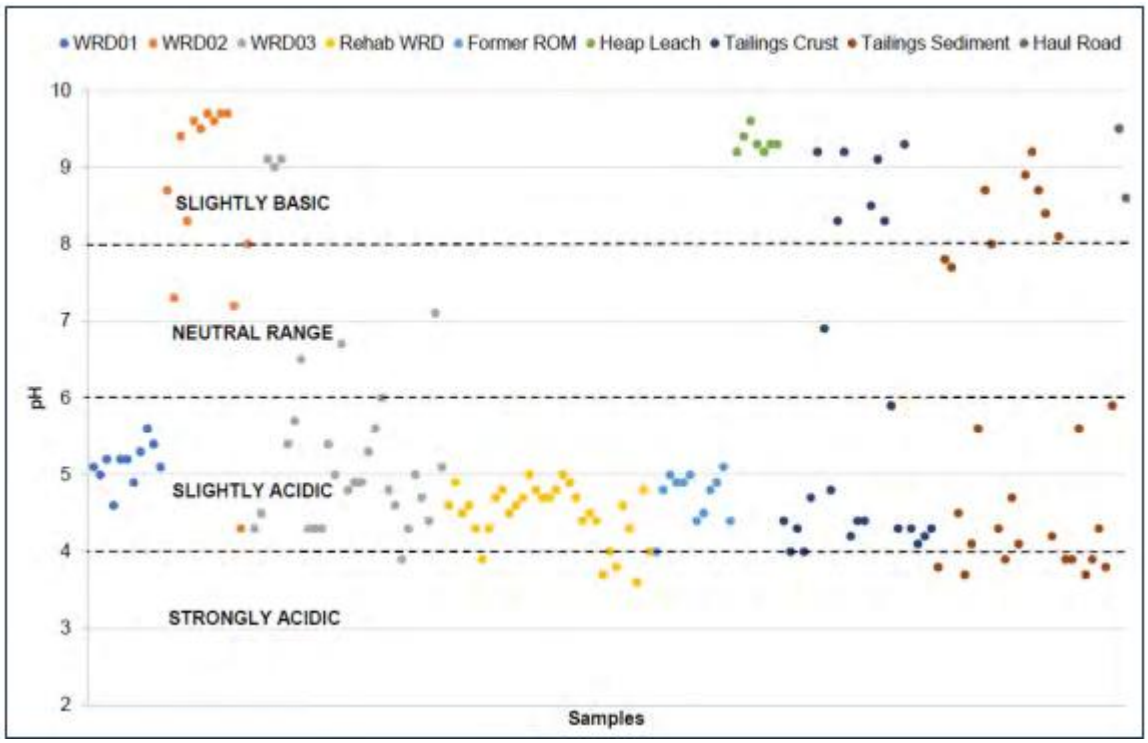


Figure 6-7 pH Vales for Wirralie Waste Rock Samples (Appendix G)

Because of the method of analysis (i.e. fluid extract from crushed samples, with a very high surface area to solution ratio), low and high pH results of samples are considered a worst-case scenario. It is envisaged that the pH of runoff from the Wirralie operations will not be as low or high as that reflected in analysis results. Additionally, for significant runoff to occur at Wirralie, the rainfall dilution factor should be greater than the 1:5 (soil:water ratio) used in analysis. This, in turn, would counteract the resulting acidity or alkalinity.

It is noted that the KLC results indicate that there is minor (developing or residual) acidity associated with the TSF. The TSF samples either decrease in pH or sustain a relatively low pH (<4.5). Waste rock samples were also below the lower pH limit, however increased over time.

6.6.2.1 Electrical Conductivity

The Electrical Conductivity (EC) of samples ranged from 8 µS/cm to 4,860 µS/cm and had a low median value of 204 µS/cm. Most Wirralie waste rock samples had low EC values (<300 µS/cm) and, apart from the tailings dam samples, all waste rock had ECs below 1000 µS/cm. TSF samples overall had higher ECs than the rest of the waste rock samples. In particular, the salinity of the surface crust of the tailings dam is much higher than the rest of the waste rock, including the tailings sediment contained below the crust (C&R Consulting,2021). EC analysis results are

displayed in **Figure 6-8**. The TSF KLC results demonstrate that the weathering of the TSF material has the potential to form moderately/highly saline waters up to around 20,000 µS/cm.

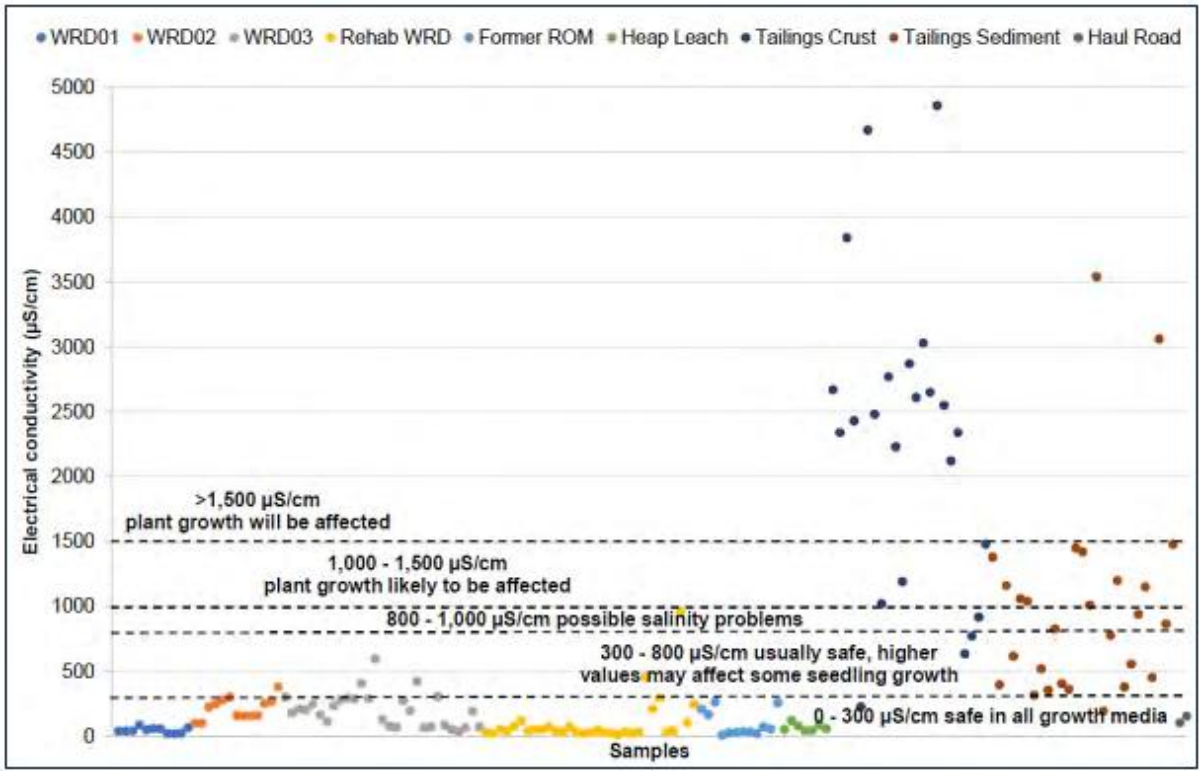


Figure 6-8 Electrical conductivity for Wirralie waste rock samples (Appendix G)

6.6.2.2 Total Sulphur

The total sulphur concentrations ranged from 0.01% to 0.60% and have an extremely low median of 0.07%. Most of the waste rock is barren of sulphur (<0.1%). Both WRD03 and the TSF have higher sulphur levels than the rest of the waste rock. However, these elevated sulphur concentrations are still classified as very low (<0.55%) (C&R Consulting,2021).

Results of total sulphur analysis is displayed in **Figure 6-9**.

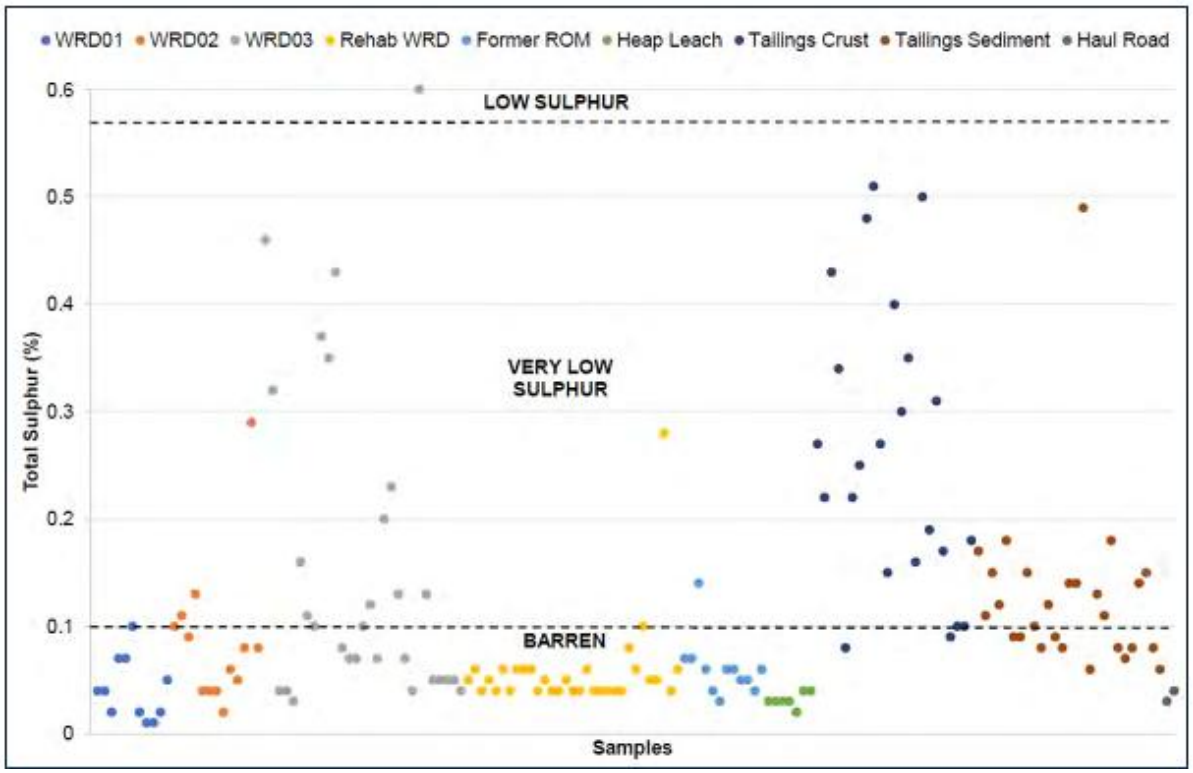


Figure 6-9 Total sulphur concentration (Appendix G)

The Maximum Potential Acidity (MPA) is the maximum amount of acid that can be generated by the oxidation of sulphur within rock, calculated from the total sulphur content. MPA for the Project waste rock ranges from 0.3 to 18.4 kg H_2SO_4/t and has a low median value of 2.1 kg H_2SO_4/t.

Acid Neutralising Capacity (ANC) is the amount of acid neutralising minerals (i.e., carbonates) in waste rock capable of neutralising acid generated by the waste rock. Waste rock samples ranged from 0.6 to 9.6 kg H_2SO_4/t eq., with a low median of 2.0 kg H_2SO_4/t eq.

The ANC:MPA ratio can assist in classifying the potential for waste rock samples to generate acid. Samples with an ANC:MPA ratio <1 are likely to be acid forming as they contain more acid-generating than acid-neutralising minerals. Samples with an ANC:MPA ratio of >2 are generally low risk however, samples with an MPA of <3.1 kg H_2SO_4/t are considered to contain insufficient acid forming potential (i.e. they are barren), and samples with an MPA of >3.1 but <10 kg H_2SO_4/t would, at worst, be classified as low capacity, potentially acid forming (PAF) material.

Waste rock samples from the WGM express ANC:MPA ratios ranging from 0 to 3.9, with a median value of 0.8. According to these ANC:MPA ratios, more than half of the WGM waste samples could be considered to be potentially acid forming. However, given the low MPA values, most of these samples are considered either barren or of low capacity with respect to acid forming potential (C&R Consulting,2021) (**Figure 6-10**).

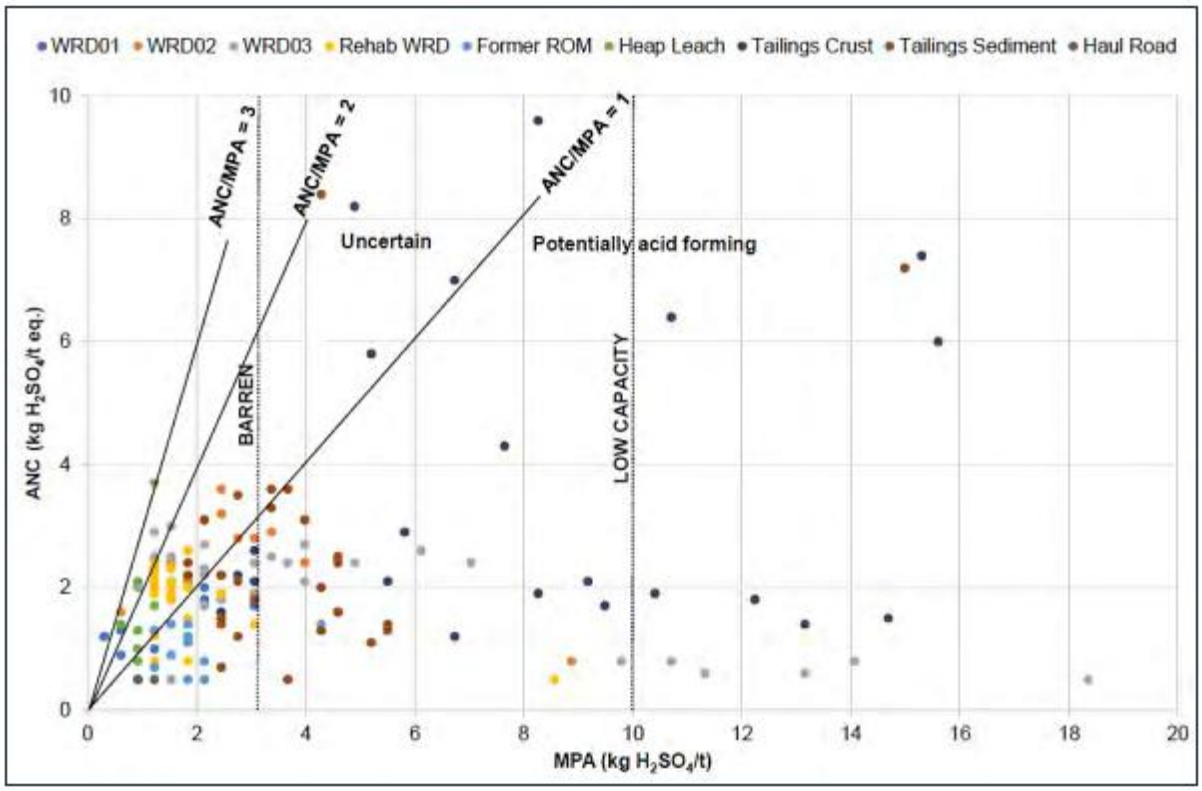


Figure 6-10 MPA versus ANC (Appendix G)

Net acid producing potential (NAPP) is a theoretical calculation of the net acid producing (or consuming) value of a waste rock. Waste rock with a negative NAPP value are non-acid forming (NAF), and those with a positive NAPP value are PAF. Categorisation of waste rock material based on the magnitude of the NAPP value is detailed in **Table 6-9**.

Table 6-9 ARD Classification

ARD Classification	NAPP Value (kg H_2SO_4/t)
Potentially Acid Forming (PAF)	>10
Uncertain	0 to 10
Non-Acid Forming (NAF)	-50 to 0
Acid Consuming Material	< -50

85 samples have positive NAPP values. However, most of these positive samples are in the uncertain range, with only seven samples having values greater than 10. These are associated with either WRD03 or the TSF (C&R Consulting,2021).

6.6.2.3 Net Acid Generation Test

The net acid generation (NAG) test is used to directly measure the net amount of acid produced by a sample. Samples with a $NAG_{(pH)}$ below 4.5 may be acid generating and samples with a $NAG_{(pH)}$ equal or greater than 4.5 (≥4.5) are unlikely to be acid generating (**Appendix G**).

Project $NAG_{(pH)}$ versus total sulphur geochemical classification criteria for samples is presented in **Table 6-10**.

Table 6-10 Geochemical Classification Criteria for Waste Rock (Appendix G)

Geochemical Classification	Total Sulfur (%)	NAG ($_{pH}$)	WRD01	WRD02	WRD03	Rehab WRD	Fromer ROM	Heap Leach	TSF Crust	TSF Sed.	Haul Road
NAF (barren)	≤0.1	-	11	10	15	30	11	7	4	12	2
NAF (very low sulphur)	>0.1 to ≤0.55	≥ 4.5	0	3	11	0	1	0	19	15	0
NAF (low sulphur)	0.55 to 1.5	≥ 4.5	0	0	0	0	0	0	0	0	0
PAF (very low sulphur)	0.1 to ≤0.55	< 4.5	0	0	1	1	0	0	0	0	0
PAF (low sulphur)	0.55 to 1.5	< 4.5	0	0	1	0	0	0	0	0	0
Percentage of NAF samples			100 %	100 %	93 %	97 %	100 %	100 %	100 %	100 %	100 %
Percentage of very low sulphur PAF samples			0 %	0 %	3.5 %	3 %	0 %	0 %	0 %	0 %	0 %
Percentage of low sulphur PAF samples			0 %	0 %	3.5 %	0 %	0 %	0 %	0 %	0 %	0 %

Of the 155 Wirralie waste rock samples, only three samples can be categorised as PAF when the $NAG_{(pH)}$ (**Figure 6-11** and **Figure 6-12**) and total sulphur values are considered:

- Two samples on WRD03, both of which occur in the same hole; and
- One sample on the rehabilitated WRD.

PAF samples make up <4 % of the total sample size for their respective areas, and their sulphur values are very low to low. It is therefore expected that these three samples will not present an acid drainage issue because:

- The amount of produced acid will be negligible; and
- Any acid produced by the samples will be buffered by the surrounding NAF rock that makes up more than 90 % of the waste rock (**Appendix G**).

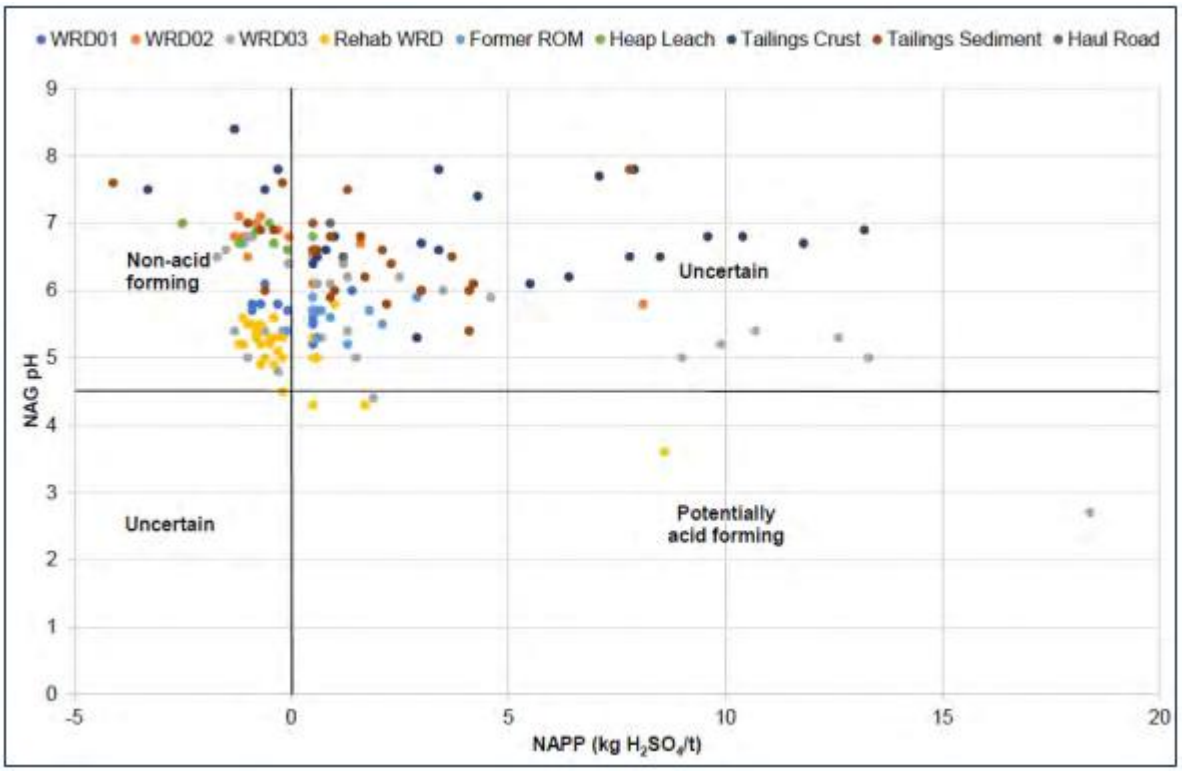


Figure 6-11 NAG(pH) versus NAPP (C&R Consulting,2021)

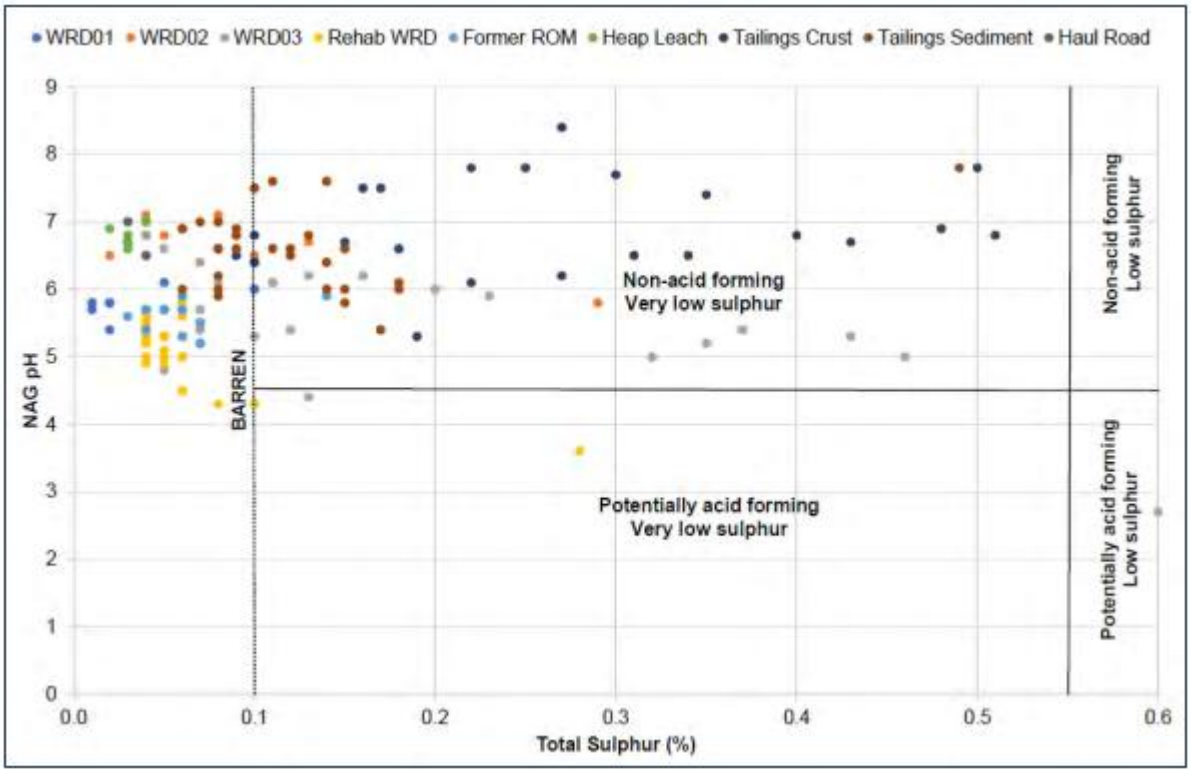


Figure 6-12 NAG(pH) versus sulphur (C&R Consulting,2021)

6.6.2.4 Metal/ Metalloid Analyses

Total metal and metalloid concentrations in the waste rock can be compared to the average crustal abundance of unmineralized soils (INAP, 2014). The geochemical abundance index (GAI) is used to report on the extent of elemental enrichment, by relating the actual concentration in a sample with the average crustal abundance on a log2 scale (**Appendix G**).

Samples with a GAI of 3 or greater indicate enrichment that may warrant further investigation. However, elements identified as enriched may not necessarily be a reason for concern regarding revegetation and/or water quality because:

- The average crustal abundance varies between different literature sources;
- Some elements are more environmentally important than others (i.e. As, Al, Cr, Cd, Cu, Pb, Se and Zn are more important than Ca, Fe, Mg and Na);
- If a sample is shown to be enriched in a particular element, there is no direct correlation that the sample will leach the element at elevated concentrations; and
- The nature of an ore deposit means that the background levels for some elements are expected to be elevated (**Appendix G**).

Summaries of the multi-element scans and GAIs for the WGM waste rock samples are presented in **Table 6-11**.

Table 6-11 Summary of Multi-Element Analyses

Parameters	Units	Limit of Reporting	ACA*	n#	Concentration statistics			NePM Guideline	GAI Statistics			
					Min.	Median	Max.	HIL – Recreational C	Min. GAI	Median GAI	Max. GAI	Number of GAIs ≥3
Aluminium	mg/kg	50	82,000	155	180	1,060	2,450	-	0	0	0	0
Arsenic	mg/kg	5	1.5	129	BLOR^	72	214	300	1	5	6	120
Barium	mg/kg	10	500	137	BLOR	30	280	-	0	0	0	0
Chromium	mg/kg	2	100	92	BLOR	6	19	300	0	0	0	0
Copper	mg/kg	5	50	29	BLOR	6	25	17,000	0	0	0	0
Iron	mg/kg	50	41,000	155	140	3,400	18,700	-	0	0	0	0
Manganese	mg/kg	50	950	67	BLOR	9	65	19,000	0	0	0	0
Mercury	mg/kg	0.1	0.05	64	BLOR	0.5	2.1	80	0	2	4	26
Nickel	mg/kg	2	80	53	BLOR	4	15	1,200	0	0	0	0
Vanadium	mg/kg	0.1	2.4	79	BLOR	8	38	-	0	0	0	0
Zinc	mg/kg	5	75	9	BLOR	7	36	30,000	0	0	0	0

^ Below Limit of Reporting

Waste rock at the Project is enriched with respect to arsenic, and to some extent, mercury with 77% of samples having an arsenic GAI ≥3 and 17% of samples have a mercury GAI ≥3. Arsenic values in waste rock are not a particular concern because they remain below the National Environment Protection Measures (NEPM) Health Investigation Level (HIL) for 'Recreational C' (public open space scenario) of 300 mg/kg (NEPC, 2013). Additionally, the Kinetic Leach Column (KLC) results indicate that the arsenic contained in the waste rock is relatively immobile.

The mercury enrichments are not a concern either because all mercury concentrations remain well below the HIL 'Residential A' (residential garden scenario) threshold of 10 mg/kg. For enrichment to be of environmental concern (water quality, revegetation etc.), a significant portion of the elements would need to be leached from the waste rock in order to enter the soil, surface water or groundwater (**Appendix G**). Additionally, the KLC results indicate that the mercury contained in the TSF is relatively immobile.

6.6.2.5 Kinetic Leach Column Water Quality Analyses

Kinetic leach column testing was completed on 11 samples to understand the potential risk of leach from the waste rock to the surrounding environment.

The kinetic results demonstrates that the waste rock is slightly acidic with majority of the pH values outside of the EA receiving water contaminant limits. However, C&R (2021) discusses the increasing pH when reacting to the leachate solution giving the possibility of, as the reaction continues, the pH value may reach the EA limit. This is further justified by the waste rock static samples being predominately NAF.

The TSF kinetic samples react with the leachate solution, decreasing in pH or sustaining a relatively low pH value (<4.5 pH) likely attributable to acid forming reactions occurring in the samples. Therefore, a minor PAF component may be associated with weathering of the TSF.

Salinity results exceeded the EA receiving water contaminant limits for three TSF samples. Salinity is not of environmental concern for the waste rock material.

The heap leach pad kinetic results indicated an arsenic exceedance, however it is not considered of environmental concern as it is likely attributed to natural background concentrations and the results show that the arsenic is relatively immobile.

Cadmium and selenium exceeded in some of the TSF samples; EGI (2002) previously reported that the TSF was enriched with selenium. Neither element was detected in the waste rock static results.

6.6.3 Summary of Waste Rock Characterisation

Acid base account results demonstrate that although most pH values are slightly acidic, results tend to be misleading due to the nature of the analysis. It is expected that – under normal conditions (i.e., dissolution and erosion of the waste rock), pH of the surface runoff would not be as acidic as that represented by the 1:5 (pulverised soil:water) extracts. The overwhelming majority (98%) of waste rock samples at Wirralie are considered NAF. These samples represent material with a very low to low risk of acid generation and a high safety factor with respect to potential acid mine drainage. Although AMD is unlikely to occur in the TSF, it must be noted that the KLC results indicate that there is minor (developing or residual) acidity associated with the TSF (C&R Consulting,2021).

Most EC measurements for the Project waste rock samples, apart from the TSF, are generally low (<300 µS/cm). In contrast, the TSF waste rock samples tend to have much higher ECs, ranging from 195 µS/cm to 4,860 µS/cm, with a median value of 1,175 µS/cm. Therefore, it is considered

that there is a very low risk of salinity issues in all waste rock areas, apart from the TSF (**Appendix G**).

Significant arsenic enrichment in the Project waste rock is likely geological because it occurs in most of the volcaniclastic waste, but not the Tertiary clay. The kinetic leach arsenic results indicate that the waste rock is significantly enriched with arsenic, however, the arsenic is relatively immobile and therefore, is not of environmental concern. Significant mercury enrichments predominantly occur in the TSF. Therefore, it is assumed that the mercury enrichment is associated with the ore rather than the mined waste, which is why it is almost entirely constrained to the TSF. Nonetheless, the kinetic results indicate that the mercury is relatively immobile (**Appendix G**).

High arsenic values in the Project waste rock are not a particular concern because they remain below the NEPM HIL for 'Recreational C' (public open space scenario) of 300 mg/kg (NEPC, 2013). The mercury enrichments are not a concern either because all mercury concentrations remain well below the HIL 'Residential A' (residential garden scenario) threshold of 10 mg/kg (**Appendix G**).

The full reports supporting this information is provided in **Appendix G, Appendix J, and Appendix K.**

6.7 Cover Design

The landform cover for WRDs and the TSF has been designed to promote the growth of vegetation and provide a stable landform and is based on the geochemical characterisation of the material, as well as the nature of the disturbance and proposed PMLUs.

As discussed in **Section 6.6**, waste rock has been assessed as having a very low to low risk of acid generation as well as a very low risk of salinity issues. Therefore, WRDs and the TSF will not require any impervious capping material prior to topsoiling.

The WRDs and TSF will have:

- Rock cover with a minimum of 1.0 m thickness – this layer will consist of a layer of well-graded NAF waste rock.
- Growth media with a minimum thickness of 0.15 m - this layer will consist of a soil cover overlying the NAF waste rock.
- Seeded with a mix of grass species (see **Section 6.12**)

6.8 Tailings Storage Facilities

The proposed PMLU for the Tailings Storage Facility / Heap Leach is Grassland. The TSF will be fenced from cattle, capped, and revegetated with a mix of shallow rooting native species. The downstream embankment will be reshaped to create a safe, stable, and non-polluting landform.

The TSF covers 73.6 ha of the southern section of WGM (**Figure 6-13**). The TSF is an unlined single cell structure comprising of the following components:

- An earthfill embankment dam acting as the tailings retaining structure (Tailings Storage);
- Waste rock is placed on the downstream of the northern section of embankment (approx. 22 ha) acting as the buttress;

- Heap Leach Pads with an approximate area of 7 ha are located within the northern corner of the TSF impoundment;
- Tailings delivery system;
- Internal decant embankment and return water system located in the western edge of the TSF;
- Clean water diversion drain located around the southern boundary of the TSF diverting surface runoff from the upstream catchment area; and
- An emergency spillway (RL277.3) located in the western end of embankment, immediately north of the decant embankment. Any overflow from the spillway flows into the Water Management Runoff Dam.

The TSF has a total available storage capacity of 1,747 ML (Northern Resources Consultants Pty Limited, 2016). As Solomon's activities are to a smaller scale and processing volumes than previous operators, the capacity is more than current operational requirements. The Design Storage Allowance (DSA) has been calculated and is presented in **Table 6-12** (STC, 2022).

Table 6-12 DSA Containment Requirements

DSA Requirements	TSF
Hazard Category	High
Critical Wet Season Duration	3 months
Wet Season Containment Criteria	1:100 AEP
Rainfall Total	922 mm
Catchment Area	103.8 ha
Runoff Coefficient	1
Calculated Runoff	956.8 ML
Process inputs over critical wet period	41.5 ML
DSA	988 ML

The characteristics of the tailings are expected to result in fast consolidation of the deposited tailings such that rehabilitation earthworks can commence very soon after deposition ceases. Decant waters currently drain to the southern portion of the TSF, referred to as the TSF wetland. Current rehabilitation practices will require removal and treatment of the wetland waters via evaporation.

Figure 6-13 Tailings Storage Facility at WGM

6.8.1 Tailings Characteristics

Geochemical analysis of the tailings material was undertaken with the full report and supporting information provided in **Appendix G**, **Appendix J**, and **Appendix K**.

TSF samples were found to have an EC range of 195 µS/cm to 4,860 µS/cm, with a median value of 1,175 µS/cm.

TSF samples were found to have arsenic enrichment, which was also accompanied by mercury. The arsenic enrichment is not considered to be of concern as the values remain below the limit for the National Environment Protection Measures (NEPM) HIL 'Recreational C' (public open space scenario), and mercury is well below the NEPM HIL 'Residential A' threshold of 10 mg/ kg. These standards are very conservative given the PMLU of the TSF is 'Grassland' and will not be open to the public.

Kinetic leach tests determined that both arsenic and mercury in the TSF were relatively immobile. Historically, Wirralie tailings had been characterised as having low acid forming potential as:

- The net acid producing potential (NAPP) for surface salts ranged from 17 to 95 kg H2SO4/t, with NAGpH values ranging 7.2 to 8.4, although most of the sulfur in the samples occurred as nonreactive salts and are therefore non-acid forming (NAF).
- The NAPP for depth profiled tailings samples ranged from 0 to 8 kg H2SO4/t, with NAGpH values ranging 6.1 to 6.7. This material is expected to be relatively barren of acid generation and therefore have a low acid forming potential.
- Multi-elemental scans performed on the tails indicate elevated arsenic concentrations above ANZECC guidelines. Mercury, antimony and selenium were enriched however in most samples were below ANZECC guidelines. Silver was enriched in some of the samples tested (NRC, 2016).

Appendix G, **Appendix J**, and **Appendix K** discuss the characteristics of the tailings material in detail. The findings of the Tailings Dam Characterisation conclude that the TSF is low risk.

6.8.2 TSF Water Quality

Water quality data for the TSF was collected in 2021 and 2023. Site inspections have historically included the monitoring and sampling of the TSF and indicated a volume of approximately 0.5 ML and standing water level of approximately 50 mm depth. Comparison of water quality data from the site inspection is presented below (**Table 6-13**).

Table 6-13 TSF Water Quality Data

Parameter	Livestock Drinking Water Limit (EA)	23-Jul-2021	12-Oct-2023
pH	6 – 9	7.88	7.05
Total Dissolved Solids	4000 mg/l	4121	4180
Sulfate	1000 mg/l	1490	1470
Arsenic	0.5 mg/l	0.084	0.285
Cadmium	0.01 mg/l	<0.0001	<0.0001
Copper	0.5 mg/l	0.014	0.005
Lead	0.1 mg/l	<0.001	<0.001

Mercury	0.002 mg/l	<0.0001	<0.0001
Molybdenum	0.05 mg/l	0.043	0.046
Selenium	0.02 mg/l	<0.01	<0.01
Zinc	20 mg/l	<0.005	<0.005
Weak Acid Dissociable Cyanide	0.2 mg/l	0.007	<0.004

6.8.3 TSF Capping and Rehabilitation Strategy

The TSF is to be rehabilitated to a PMLU of 'Grassland'. The current fall on the TSF allows water to pond at the western end, covering approximately 25 ha of the area. The heap leach pad area covers an area of approximately 5 ha.

As mentioned in **Section 6.6** (and **Appendix G**, **Appendix J**, and **Appendix K**), the tailings material is considered to have a low risk of acid forming potential. The results of kinetic leach testing indicated that most elements, with the exception of cadmium and selenium, were well below the respective receiving water contaminant limits. As discussed in **Appendix K**, the potential mobility of cadmium and selenium is high, however its absorption by other characteristics of the tailings limits the mobility and bioavailability of both elements. The elevated levels of arsenic and mercury, as detected in the static test work, are relatively immobile, as indicated by the kinetic test work.

The tailings material is considered low risk. As the TSF is considered low risk, the rehabilitation strategy for the TSF is 1.0 m of waste rock and 0.15 m of soil and seeding with selected grass species.

The waste rock material is considered low risk and NAF (see **Section 6.6**) which is suitable to act as a working layer for the TSF cap. The waste rock material will not be required to stabilise the structure of the TSF (i.e., embankments). The waste rock material will support the growth media by restricting the uptake of salts and assist with the moisture cycling zone allowing efficient evapotranspiration. The waste rock layer will also provide a further solid barrier between the potential contaminants and receiving environment as well as reducing percolation, oxygen ingress, and erosion.

The soil layer will be spread across the waste rock material and seeded with the selected seed mix of shallow rooting grass species providing a landform supporting the PMLU of grassland whilst isolating the risks associated with the tailings material.

As the TSF is required during mining operations, rehabilitation will be undertaken once mining is finished.

During operation the TSF will continue to be filled until the design capacity is reached. The cover will be constructed using waste rock material (1.0 m) to provide a working layer with topsoil at least 0.15 m deep layered on top to bring the domain to the final landform shape and elevation. Each layer will be shaped to follow the natural landscape and to be free draining. The topsoil will be ripped and seeded.

The final landforms will be assessed by a suitably qualified person during rehabilitation efforts to assure it is stable and non-polluting along with required monitoring.

Rehabilitation of the TSF will be timed to begin slightly later than the adjacent WRD3 as the waste rock material for the TSF capping will be sourced from the WRD.

The strategy is also designed to handle climate variability; water control systems to be implemented will convey water as needed especially during initial rehabilitation stages. Conveying runoff is an important mechanism for minimising erosion and ensuring success (INAP, 2017).

The water controls and catchments allow for effective runoff particularly during the summer months when the region experiences the wet season. The final landform is to be free draining avoiding ponding and areas of significant weathering.

The purpose of the cover system is to provide a stable, reliable, and sustainable engineered barrier isolating the potential contaminants from the receiving environment while supporting the PMLU. The social benefit of re-establishing grassland is the aesthetic appearance and cohesion with the surrounding environment. The chosen rehabilitation strategy will ensure the TSF is rehabilitated to a safe, non-polluting, and free-draining state. The vegetation will further strengthen the capping material and maintain its integrity preventing potential contamination from tailings. Vegetation will also help stabilise and reduce erosion of the capping material.

6.9 Void Closure Plan

There are five residual voids at WGM, totalling 22.2 ha (**Table 6-14**). All residual voids are classified as NUMAs, as per the LODs.

The final voids will be left in a safe, stable condition with a safety bund wall around each void, constructed from competent, benign waste rock and/or fencing. The remaining landforms will be re-shaped to promote stable, free-draining conditions away from the residual voids. The safety bund wall will be constructed as described in "Technical Guidelines for the Environmental Management of Exploration and Mining in Queensland" (DME, 1995).

The distance for placement of the safety bund will be calculated to achieve a minimum Factor of Safety (FoS) of ≥1.5 under static conditions.

It is currently anticipated that only access to Pit B will be required for ongoing operations. Existing fences and bunds for the other voids will remain in place during operation and fencing and bunding will be reconstructed around Pit B post-closure. Appropriate signage will also be installed as per the other voids.

The residual voids still have a considerable amount of gold resources remaining. Not backfilling the pits avoids sterilisation of the resource, enabling the potential for future resource use.

Table 6-14 Residual Void Surface Area

Residual Void	Area (ha)	Void Water Level (mAHD)	Pit Crest Elevation (mAHD)
Pit A	9.0	242.5	250.0
North Pit	0.9	242.5	250.0
Blinky Pit	0.4	245	251.0
Deep Lead Pit	2.8	229	255.0
Pit B	9.2	NIL	271.0
Total	**22.2**		

6.9.1 Options for Minimising Size and Volume of Residual Voids

As the residual voids are pre-approved as NUMAs under the LODs, options for minimising the size of the residual voids have not been considered.

6.9.2 Void Water Balance

All pits represent legacy voids from previous mining operations and will retain their current geometry at closure. No backfilling of pit voids is proposed. For the purposes of void water balance modelling, Pit A and North Pit were assessed together due to their shared catchment and potential for hydraulic interaction at elevated water levels. Deep Lead Pit and Blinky Pit were assessed independently. Pit B was not subject to detailed analytical modelling to its current hydrogeological setting indicating limited groundwater interaction; however, it remains part of the final void system. Detailed assumptions regarding pit geometry, catchment areas and modelling configuration are provided in **Appendix H**

6.9.2.1 Model Design

A pit water balance model was developed to estimate the long-term hydrological behaviour of the final voids at the Wirralie Project. The model incorporates climatic inputs, runoff,

groundwater inflow and evaporation to assess equilibrium water levels and potential for overflow.

The model was undertaken using a monthly time step and assessed over long-term climatic conditions to determine steady-state or equilibrium behaviour. The modelling approach is conceptual and is intended to support closure planning by assessing the likely hydrological behaviour of the pit voids rather than predicting exact water levels (**Appendix H**).

Climate inputs for the modelling were derived from long-term regional datasets. Mean annual rainfall and evaporation values adopted in the modelling are approximately 566 mm and 1891 mm, respectively. Rainfall data was sourced from the Scientific Information for Land Owners (SILO) database.

Runoff to each pit was estimated based on the contributing catchment area and an assumed runoff coefficient. A runoff coefficient of 0.35 was adopted, which is considered appropriate for the semi-arid conditions and surface characteristics of the site.

Catchment areas were defined based on topographic interpretation and drainage patterns, including the combined catchment of Pit A and North Pit.

Average pan evaporation data has been obtained from SILO and provides an indication of potential evaporation from open water surfaces. However, actual evaporation from pit voids is typically lower than pan evaporation due to factors such as reduced wind exposure and shading from pit walls. Accordingly, a correction factor is required to better represent in situ conditions. For deep pit voids, a correction factor of 0.7 is commonly applied to account for these effects (**Appendix H**)

Pit geometry inputs, including pit surface area and depth relationships, were based on available survey and design information (**Appendix H**).

6.9.2.2 Results

Groundwater inflow estimates, derived using analytical methods and site-representative hydraulic parameters, are relatively low compared to evaporative losses. Consistent with the adopted hydraulic conductivity range and low recharge conditions, inflows reduce significantly as pit water levels rise and the hydraulic gradient towards the void diminishes. As a result, all voids reach equilibrium conditions where water levels stabilise below the surrounding regional groundwater table (**Table 6-15**).

For Pit A and North Pit, which were modelled as a combined system due to their potential hydraulic connectivity, the results indicate that pit lake levels may periodically rise sufficiently to enable hydraulic interaction between the two voids. However, even under these conditions, the combined system remains strongly evaporation-dominated. The predicted equilibrium water level for the combined system remains below the regional groundwater table, confirming that the system will function as a terminal evaporative sink. The rate of groundwater inflow decreases progressively as equilibrium is approached, consistent with the reduction in hydraulic gradient.

Deep Lead Pit exhibits a similar response, with modelling indicating that the combination of limited catchment area and low groundwater inflow is insufficient to offset evaporation. The equilibrium water level is predicted to remain below the surrounding groundwater table, and groundwater inflows are minor relative to evaporative losses throughout the simulation period. Accordingly, Deep Lead Pit will function as a groundwater sink under post-closure conditions.

For Blinky Pit, the modelling results also indicate a net negative water balance. Despite contributions from runoff and groundwater inflow, evaporation remains the dominant flux. The

predicted equilibrium condition is characterised by a stable water level below the regional groundwater table, confirming that Blinky Pit will operate as a groundwater sink.

Although Pit B was not subject to detailed quantitative modelling, its geometry, limited contributing catchment, and hydrogeological setting are consistent with the conditions modelled for the other voids. Based on these factors, and in the absence of any mechanism to sustain a positive water balance, Pit B is also expected to behave as a groundwater sink following closure.

Across all voids, the modelling does not identify any conditions under which equilibrium water levels exceed the surrounding groundwater table. As such, no voids are expected to function as groundwater sources. Similarly, the modelling does not indicate conditions where pit water levels stabilise at or near the regional groundwater table in a manner consistent with flow-through systems.

Table 6-15 Final Void Modelling Results (Appendix H)

Pit Name	Behaviour Classification	Basis of Classification
Pit A	Sink	Equilibrium water level below groundwater table; evaporation exceeds inflows
North Pit	Sink	Hydraulically connected with Pit A; combined system behaves as sink
Pit A + North Pit (combined)	Sink	Modelled system; evaporation-dominated water balance
Deep Lead Pit	Sink	Limited inflows relative to evaporation; equilibrium below groundwater table
Blinky Pit	Sink	Net negative water balance; equilibrium below groundwater table
Pit B	Sink (qualitative)	Consistent hydrogeological setting and site-wide modelling outcomes

6.9.2.3 Overtopping Assessment

The potential for pit lake overtopping was assessed using a conservative water balance scenario based on a 1% Annual Exceedance Probability (AEP) rainfall event applied to existing elevated pit water levels (**Table 6-16**). This approach represents a reasonable worst-case condition, where pits are already near higher water levels and are subjected to extreme rainfall inputs.

For Pit A, the contributing catchment of North Pit was included in the assessment due to the potential for hydraulic connectivity between the two voids under elevated water level conditions.

The results of the assessment indicate that all pits retain substantial freeboard under the 1% AEP scenario, with predicted water levels remaining well below pit crest elevations. This demonstrates that overtopping is not expected under extreme rainfall conditions. For the combined Pit A and North Pit system, the simulated water level increases from approximately 242.5 mAHD to 244.1 mAHD under the 1% AEP event, which remains significantly below the pit crest elevation of 250 mAHD. This indicates that even under extreme rainfall conditions, there is sufficient storage capacity to prevent overtopping.

Similarly, Deep Lead Pit shows an increase in water level from approximately 229 mAHD to 231.5 mAHD under the same conditions, which is well below the crest elevation of 255 mAHD, indicating a very low overtopping risk.

For Blinky Pit, minimal change in water level is predicted under the 1% AEP scenario. While the pit has a crest elevation of approximately 251 mAHD and may hydraulically spill towards Pit B under extreme conditions, the modelling indicates that water levels remain well controlled and do not approach crest levels under the assessed scenario.

Overall, the overtopping assessment confirms that all pit voids have sufficient storage capacity to accommodate extreme rainfall events without overtopping. This outcome is consistent with the evaporation-dominated water balance identified in the modelling and further supports the classification of the voids as terminal sinks.

Table 6-16 Summary of Overtopping Assessment

Pit Name	Initial Water Level (mAHD)	Pit Crest Elevation (mAHD)	Water Level under 1% AEP (m AHD)	Freeboard (m)	Overtopping Risk
Pit A (including North Pit)	242.5	250.0	244.1	5.9	Low (No overtopping predicted)
Deep Lead Pit	229.0	255.0	231.5	23.5	Very Low (No overtopping predicted)
Blinky Pit	245.0	251.0*	Minimal change	~6.0	Low (No overtopping predicted; potential spill towards Pit B but only under extreme conditions)

6.9.3 Source-Pathway-Receptor Assessment

A source-pathway-receptor assessment has been undertaken to evaluate the potential for site sources to affect groundwater environmental values during current operations and under post-closure conditions. The assessment considers both changes in groundwater quality and changes in groundwater level, and focuses on those sources, pathways and receptors that are relevant to the Project hydrogeological setting (**Appendix H**).

The most relevant contaminants or stressors for groundwater are:

- acidity
- sulfate
- salinity
- dissolved metals and metalloids
- localised groundwater level change associated with pit-water interaction

The principal pathway assessed in the hydrogeological report is groundwater (**Appendix H**). The void modelling (**Section 6.9.2**) indicates that all residual voids are expected to behave as groundwater sinks under closure conditions, with no void predicted to behave as a sustained

source or flow-through system. In addition, overtopping risk is low, with all modelled pits remaining below crest under the 1% AEP event (**Section 6.9.2.3**). These outcomes mean that the residual pits are expected to act as local hydraulic receptors and evaporative sinks, which substantially reduces the likelihood of post-closure off-site migration of pit-derived solutes through groundwater.

Potential terrestrial and aquatic GDEs are considered low-likelihood receptors because:

- groundwater levels are generally too deep to sustain shallow aquatic dependency near the site;
- local surface water features are ephemeral;
- no baseflow-supported conditions have been identified; and
- GDEs are unlikely both onsite and along nearby creek systems.

For closure conditions, the sink behaviour of all residual pits further reduces the likelihood of any future pathway from pit waters to downgradient aquatic receptors, because hydraulic gradients are directed toward the voids rather than away from them. On this basis, no material future impact to aquatic GDEs is predicted from pit lakes under closure conditions.

Other environmental values, including drinking water, agriculture, aquaculture, food production, and recreation, are not considered relevant groundwater receptors in the immediate Project area based on current evidence of use and receptor presence. Cultural and spiritual values are recognised qualitatively; however, no specific groundwater receptor has been identified. Consequently, no material groundwater impact is predicted for these environmental values in the context of the current hydrogeological assessment.

The overall source-pathway-receptor assessment indicates that:

- the principal potential groundwater sources are the pits, WRDs, TSF, and secondarily smaller water storages;
- the principal stressors are acidity, sulfate, salinity, metals/metalloids, and localised groundwater level change;
- the only material pathway considered is groundwater; and
- the most relevant receptors are potential terrestrial GDEs, with aquatic GDEs considered low
- likelihood and industrial groundwater use considered low sensitivity in the local receptor context.

Closure modelling is that all residual pits are predicted to act as groundwater sinks rather than sources. Overtopping risk is also low, further reducing the likelihood of uncontrolled release from pit water bodies.

On this basis:

- impacts on aquatic GDE are assessed as highly unlikely;
- impacts on terrestrial GDE are assessed as low to highly unlikely; and
- no material off-site groundwater impacts are predicted under closure conditions.

6.10 Underground

The WGM is an open cut gold mine with no underground mining operations approved. PRCP requirements relating to underground operations have not been considered.

6.11 Water Management

The water management approach at WGM separates clean stormwater from potentially affected site water. Clean water is separated from the site through the construction of large diversion bunds and drains, preventing water from accessing the mining area. Site water, including stormwater, is kept separate from clean water, and is captured in the site water system.

Closure objectives for WGM stipulate final landforms are to be geochemically stable and will be not generate seepage or leaching to surface water or groundwater.

During a previous site closure of approximately 10 years, water across site continued to be diverted to the TSF, and runoff dam. No discharge to the environment occurred during this period and drains and bunds continued to divert clean water around and away from site. These remain in place. A similar approach to post-closure water management will be adopted. Pit voids will continue to act as sinks for groundwater (**Section 6.9.2**) and the runoff dam will be used as water storage for agricultural purposes.

The Runoff Dam is to be utilised as a sedimentation basin until the catchment has appropriately stabilised/rehabilitation. Once complete, it will be desilted and retained on site with a PMLU of water storage. Converting the Runoff Dam to water storage will be preferential as this would result in a PMLU that supports the surrounding land uses (low intensity grazing).

Drains that become redundant will be rehabilitated; however, the major cut-off drain will remain in place to continue functioning as a diversion.

The residual voids will contain contaminated water but these are modelled to act as groundwater sinks and therefore cause no contamination to the receiving environment. There are no dewatering requirements or on-going water management requirements post-closure for residual voids.

6.12 Revegetation

Appropriate plant species will be used for seeding, and seeding will occur as detailed in the rehabilitation program (**Section 6.12**). When possible, areas will be seeded directly with selected species. Where direct seeding is not possible, seeds will be manually broadcast.

6.12.1 Objectives

The PMLUs for WGM are ‘Low Intensity Grazing’ and ‘Grassland’, which are reflective of the pre-mining land-use within and surrounding the area. The objectives for revegetation are to achieve the following:

- Establish sufficient vegetation cover on high-risk structures to minimise erosion;
- For ‘Grassland’ PMLU - ensure deep-rooted plants which may compromise the performance of capping on the TSF and WRDs are not seeded;
- For ‘Low Intensity Grazing’ – provide feed for cattle;
- Tie into the surrounding land uses; and
- Establish species similar to the surrounding area.

6.12.2 Species Selection

The following list of species have been proposed as suitable for revegetation (**Table 6-17**). These species were identified within the WGM area during surveys (**Appendix E**) and are suitable for the proposed PMLUs of 'low intensity grazing' and 'grassland'.

Where possible seeds for these species will be collected locally to ensure adaptation to the local environment. Otherwise, seed will be sourced from a reputable supplier.

Not all recommended species are required for successful rehabilitation, however it is intended to seed a mix of these species as available, to increase species richness where practical.

Table 6-17 Species Selection for Revegetation of PMLU Areas

Species Name	Common Name	3P	Seeding Rate	Timing
Aristida jerichoensis	Jericho Wiregrass	Y	1-3 kg/ha	Immediately prior to wet-season
Panicum decompositum	Native millet	Y	1-3 kg/ha	
Sporobolus contiguus	False Katoora Grass		1-3 kg/ha	
Tripogon loliiformis	Five minute grass	Y	1-3 kg/ha	
Heteropogon contortus	Black spear grass	Y	1-3 kg/ha	
Aristida caput-medusae	Many Headed Wiregrass	Y	1-3 kg/ha	
Bothriochloa decipiens	Bothriochloa	Y	1-3 kg/ha	
Bothriochloa ewartiana	Desert bluegrass	Y	1-3 kg/ha	
Dactyloctenium radulans	Button grass	Y	1-3 kg/ha	
Paspalidum caespitosum	Brigalow grass	Y	1-3 kg/ha	
Themeda triandra	Kangaroo grass	Y	1-3 kg/ha	
Aristida calycina	Dark Wire-Grass	Y	1-3 kg/ha	
Eragrostis sororia	Lovegrass		1-3 kg/ha	
Eriachne mucronata	Mountain Wanderrie		1-3 kg/ha	
Chrysopogon filipes	Australian Vetiver		1-3 kg/ha	
Cymbopogon obtectus	Silky Heads		1-3 kg/ha	
Leptochloa digitata	Umbrella Cane-Grass		1-3 kg/ha	
Paspalidium distans	Shotgrass		1-3 kg/ha	
Paspalidium gracile	Slender panic		1-3 kg/ha	
Tragus australianus	Small burr grass		1-3 kg/ha	
Cymbopogon refractus	Barbed-wire grass		1-3 kg/ha	
Eragrostis lacunaria	Purple lovegrass		1-3 kg/ha	
Eragrostis tenellula	Delicate lovegrass		1-3 kg/ha	

6.12.3 Seeding Methodology

Where practicable, revegetation will occur through direct seeding of the proposed species. Where direct seeding is not possible (e.g. small areas with limited access), the seeds are to be manually broadcast. Seeding rate will vary depending on the probability of rainfall for the season and availability of suitable seed mixes. Predicted average seeding is presented in **Table 6-17**.

Seeding is to coincide with the onset of the wet season thereby ensuring the greatest chance of establishment (around between November to December each year). Providing adequate rainfall has occurred, establishment of seedlings should take place within approximately one month of direct seeding. Reseeding may be necessary if germination fails in some areas. Any seeds awaiting use will be stored in cool, dry conditions and protected from insects to ensure viability.

6.12.4 Soil Treatment

Prior to seeding, areas will be re-shaped (as required), topsoiled and ripped then seeded. Topsoil, or blended subsoil will be spread to a depth of at least 0.15 m at areas being rehabilitated. It is recommended that topsoil is to be placed at locations nearest to its possible point of origin. This will minimise transport costs and maximise the potential for germination from within the soil seed bank.

Where possible, ripping of the surface is to occur prior to spreading topsoil, to ensure a compacted pan does not form under the topsoil layer. This will aid in the reduction of soil erosion and increase plant establishment rates.

7.0 Mine Closure Risk Assessment

A closure and rehabilitation risk assessment has been prepared in accordance with Section 126C(1)(f) of the EP Act. The risk methodology utilised has been developed based on the Australia and New Zealand Standard AS/NZS for Risk Management – Principles and Guidelines (ISO 31000:2018).

The risk management process involves the systematic application of policies, procedures, and practices to the activities of communicating and consulting, establishing the context and assessing, treating, monitoring, reviewing, recording, and reporting risk.

Closure and rehabilitation risk assessments have the objective to identify and define specific risks from closure and rehabilitation and associated activities toward environmental, economic, and social values.

The purpose of risk identification is to find, recognise and describe risks that might help or prevent an organisation achieving its objectives. Relevant, appropriate, and up-to-date information is important in identifying risks (Standards Australia, 2018).

The following factors have been considered by this risk assessment:

- Tangible and intangible sources of risk;
- Causes and events;
- Threats and opportunities;
- Vulnerabilities and capabilities;
- Changes in the external and internal context;
- Indicators or emerging risks;
- The nature and value of assets and resources;
- Consequences and their impacts on objectives;
- Limitations of knowledge and reliability of information;
- Time-related factors; and
- Biases, assumptions, and beliefs of those involved.

7.1 Principles and Methodology

The purpose of risk analysis is to comprehend the nature of risk and its characteristics, including, where appropriate, the level of risk. Risk analysis can be undertaken with varying degrees of detail and complexity, depending on the purpose of the analysis, the availability and reliability of information and the resources available. Risk analysis techniques can be qualitative, quantitative or a combination of these and should include:

- The likelihood of events and consequences;
- The nature and magnitude of consequences;
- Complexity and connectivity;
- Time-related factors and volatility;
- The effectiveness of existing controls; and
- Sensitivity and confidence levels.

A likelihood of occurrence and severity of consequence rating has been assigned to each identified risk in accordance with the risk matrix detailed in **Table 7-1**. Control measures have been developed following the identification of risks to achieve a level of risk that is considered to be an acceptable level, as described in **Table 7-2**.

Table 7-1: Risk Matrix

Likelihood of Occurrence	Severity of Consequence				
	Catastrophic (5)	Major (4)	Moderate (3)	Minor (2)	Insignificant (1)
Almost certain (5)	10	9	8	7	6
Likely (4)	9	8	7	6	5
Possible (3)	8	7	6	5	4
Unlikely (2)	7	6	5	4	3
Rare (1)	6	5	4	3	2

Risk Score	Risk Rating	Actions Required
9 – 10	Extreme	Requires immediate action to reduce risk score.
7 – 8	High	Requires an action plan approved by senior management.
5 – 6	Moderate	Specific monitoring and procedures required.
2 - 4	Low	Management through routine procedures and protocols.

7.2 Risk Matrix

Table 7-2: Risk Evaluation

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
Waste Rock Dumps									
Safe									
Slope angle in excess of design resulting in safety hazard to personnel and wildlife.	2	3	5	Landform design which considers final slope requirements (e.g. ≤15%). Construction QA/ QC and as constructed design verification.	1	3	4	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Surface condition insufficient to support safe use by personnel and wildlife.	2	2	4	Surface preparation measures, monitoring and maintenance carried out by suitably qualified persons.	1	2	3	n/a	n/a
Stable									
Slope failures resulting in localised land, and downstream water quality impacts.	2	3	5	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration where required. Vegetation establishment, monitoring and management as required.	1	3	4	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Ongoing gully or rill erosion of rehabilitated areas resulting in localised land,	2	3	5	Improved drainage network and sub-catchment design, effective revegetation techniques,	1	3	4	Revegetation, completion criteria includes final geotechnical assessment, no	n/a

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
and downstream water quality impacts.				rehabilitation monitoring and management as required.				failures observed during monitoring periods.	
Significant slope failure as a result of adverse rainfall events resulting in localised land, and downstream water quality impacts.	1	4	5	Slope ≤15%, adequate drainage structures. Engineering designs to be implemented and verified on ground in line with as built construction requirements	1	2	3	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Non-polluting									
Waste Rock Dumps generate acid or saline drainage resulting in localised impacts to downstream receptors.	2	4	6	Materials identified as Non Acid Forming and very low risk of saline drainage.	1	2	3	Regular water quality monitoring and assessment, water quality monitoring in receiving environment meets completion criteria.	n/a
Voids									
Safe									
Void areas still able to accessed by personnel and wildlife resulting in slips, trips, falls and injury or death to humans or wildlife.	3	3	6	Ensure sufficient fencing and signage around voids to prevent access to hazardous areas (e.g. pit lake or high walls). Construct safety bunds.	1	3	4		
Void overtopping as a result of an extreme rainfall event beyond hydrological model predictions resulting in hazard to humans and wildlife.	2	5	7	Final void hydrological models indicate voids will not overtop.	1	2	3		

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
Stable									
Erosion of high walls resulting in impacts to pit lake water quality.	3	2	5	Void slopes to be established at a batter angle which minimises erosion. Geotechnical survey to be undertaken to confirm pit wall stability.	1	2	3		
Non-polluting									
Mine Affected Water contributes to local groundwater aquifer resulting in impacts to water quality.	2	3	5	Final void hydrological models indicate voids act as groundwater sinks.	1	3	4	Current water balance indicates voids act as a groundwater sink with a negative water balance.	
Tailings Storage Facilities									
Safe									
Slope angle in excess of design resulting in safety hazard to personnel and wildlife.	2	3	5	Landform design which considers final slope and capping requirements Construction QA/ QC and as constructed design verification.	1	3	4	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Surface condition insufficient to support safe use by personnel and wildlife.	2	2	4	Surface preparation measures, monitoring and maintenance carried out by suitably qualified persons.	1	2	3	Verification of capping integrity and suitability by a RPEQ engineer.	n/a
Stable									

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
Slope failures resulting in localised land, and downstream water quality impacts.	2	3	5	Landform design moderating slope, adequate/effective subsoil and topsoil amelioration where required. Vegetation establishment, monitoring and management as required.	1	3	4	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Ongoing gully or rill erosion of rehabilitated areas resulting in localised land, and downstream water quality impacts.	2	3	5	Improved drainage network and sub-catchment design, effective revegetation techniques, rehabilitation monitoring and management as required.	1	3	4	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Significant slope failure as a result of adverse rainfall events resulting in localised land, and downstream water quality impacts.	1	4	5	Slopes ≤15%, adequate drainage structures. Engineering designs to be implemented and verified on ground in line with as built construction requirements.	1	2	3	Revegetation, completion criteria includes final geotechnical assessment, no failures observed during monitoring periods.	n/a
Non-polluting									
Mine Affected Water contributes to local groundwater aquifer resulting in impacts to water quality.	2	3	5	Hydrogeological survey	1	3	4	Current water balance indicates voids act as a groundwater sink with a negative water balance.	n/a
Tailings Storage Facility generates acid or saline drainage resulting in localised impacts to downstream receptors.	2	4	6	Materials identified as Non Acid Forming and very low risk of saline drainage.	1	2	3	Regular water quality monitoring and assessment, water quality monitoring in receiving environment meets completion criteria.	n/a

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
Overtopping as a result of an extreme rainfall event beyond hydrological model predictions resulting in hazard to humans and wildlife.	2	5	7	Final hydrological models indicate voids will not overtop.	1	2	3	n/a	n/a
General									
Failure to remove all infrastructure in accordance with schedule. Achievement of RM1 is delayed.	2	3	5	A register of infrastructure is to be developed to track which structures exist in each rehabilitation area. Demolition works to be scoped with area managers to identify all infrastructure.	1	2	3	Contractors will return to site to remove all infrastructure	The proposed actions will ensure the demolition works are correctly scoped and scheduled.
Previously unidentified contamination source discovered. Financial cost of Achievement if remediation is delayed.	3	3	6	Records are to be kept of all spills and other incidents occurring at the Project that might result in contamination. Employees and contractors are to be made aware of their reporting obligations through a Site Induction. Initial consultation with an approved contaminant land assessor to identify contamination targets for remediation or removal.	2	2	4	Disturbance is restricted to approved areas as defined on the EA. Initial contaminant land assessments will identify areas for further investigation and remediation. Conduct validation sampling to determine that contaminant removal has been successful.	Ongoing rehabilitation monitoring will identify presence of previously unidentified contaminants. Any contamination will be investigated and further contaminated land sampling/ removal will be conducted as required.
Water ponding	4	3	7	A QAQC inspection will be completed after works to confirm	2	2	4	QAQC review will allow issues to be addressed prior to next RM Landform will be	

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
Erosion leading to contamination of water ways.				landform has been appropriately shaped.				reshaped until stability is achieved.	
Insufficient topsoil Unsuccessfully revegetation	4	3	7	Additional topsoil will be obtained from borrow pits or an external source if required.	2	2	4	Ongoing erosion and vegetation monitoring will guide management interventions. Additional topsoil will be applied as required.	
Vehicles contaminated with weed seeds used for earthworks. Weeds invading rehabilitated sites, inhibiting the establishment of desirable species	3	2	5	Vehicles will be inspected prior to entering site. Vehicles will be cleaned in the site washdown bay if weeds or seeds are identified.	2	2	4	Site has established processes to minimise risk.	A weed treatment program will be implemented, if required
Heavy rainfall occurring prior to establishment of vegetative cover. Loss of topsoil Siltation of downstream waterways. Failure of vegetation to establish on eroded surfaces. Cost of reapplying topsoil to eroded surfaces	3	2	5	Earthworks will be completed during the dry season. Earthworks will be scheduled progressively so that areas are exposed for the least amount of time possible.	2	2	4	Rehabilitation monitoring will guide corrective action (reseeding, etc) as required.	The area has established wet/dry seasons and works can be scheduled.

Potential Impact	Risk Rating			Risk Control	Residual Risk Rating			Treatment	Comments
	L	C	R		L	C	R		
Grazing could lead to poor seedling establishment	2	2	4	Areas will be fenced to allow vegetation to establish.	1	2	3	Rehabilitation monitoring will guide corrective action (reseeding, etc) as required.	
Significant erosion. Loss of topsoil. Siltation of downstream waterways. Failure of vegetation to establish on eroded surfaces. Cost of reapplying topsoil and seed to eroded surfaces.	3	2	5	Low slope gradient in landform design to limit capacity for sediment loss. Annual monitoring to identify high risk areas	2	2	4	Monitoring will allow early identification and intervention. Rehabilitation monitoring will guide corrective action (topsoiling etc) as required.	
Unable to demonstrate receiving environment meeting stipulated water quality limits.	3	4	7	Monitoring of surface waters, groundwaters and sediments will continue post closure by AQP to identify potential impacts. Results to be analysed by a AQP	2	2	4	Ensuring all other RMs are met will allow for good water quality.	Monitoring throughout operation and the rehabilitation activities will allow early identification and intervention to meet the schedule

8.0 Monitoring and Maintenance

The overall aim of the rehabilitation monitoring program is to provide the WGM with accurate information about the performance and development of its rehabilitation over time. Within this broad aim, there are specific objectives, including:

- Undertake consistent and standardised monitoring, with a view to obtain a dataset to monitor progress against benchmarks;
- Assess when rehabilitation targets have been reached;
- Identify corrective actions/recommendations (i.e., maintenance and remedial works);
- Provide feedback for continuous improvement of the rehabilitation process at the mine site; and
- Provide rehabilitation data suitable for inclusion in forming agreed rehabilitation targets for progressive rehabilitation certification to progress towards EA surrender.

The Rehabilitation milestones (RMs) and associated milestone criteria for WGM are detailed in **Table 9-2**. RM monitoring and reporting will be undertaken at WGM to demonstrate achievement of the RMs, as they relate to achieving surface requirements and PMLU criteria for Low Intensity Grazing and Grassland.

A combination of approaches will be used to monitor and report on achievement of RMs. Monitoring and reporting requirements will primarily involve documentation and/or inspections and sign off by an appropriately qualified person that milestones have been achieved. Rehabilitation milestone monitoring for achieving the PMLUs will involve ongoing monitoring in accordance with a schedule whereby permanent monitoring sites will be established, and data will be collected in a repeatable manner to enable statistical analysis to assess the performance of rehabilitation. The results of ongoing PMLU monitoring will be used to determine if rehabilitation areas are on track towards achieving the relevant PMLU criteria or if rehabilitation areas may require maintenance, as discussed in **Section 8.2** to improve their performance.

Table 8-1 Rehabilitation Monitoring Schedule

Monitoring Activity	Year 1-3	Year 5	Year 7	Year 10 Onwards	Milestone Criteria
Safe to Humas, Wildlife and Stock					
Risk Assessment	Once				• Long-term safety aspects of the mine have risk controls implemented. • Risk assessment review indicate that risk ratings are maintained, adequate and equivalent or lower than previous assessment.
Stable					
Event Inspections	Wet Season	Wet Season	Wet Season	Wet Season	• No maintenance required.
Inspection of Void Walls	Annually	Annually	Annually	Annually until relinquishment or until milestone met	• A safety bund or fencing is installed at ≥1.5 FoS perimeter offset boundary of residual voids to prevent access. • Geotechnical investigations of the void walls demonstrate geotechnical stability has been achieved.
Erosion monitoring	Annually	Once	Once	Every five years until relinquishment or until milestone met	• An Appropriately Qualified Person (AQP) certifies that there is no erosion classified as 'moderate' or 'severe' as defined by Table 9-4 – Erosion Classification Framework.
No Environmental Harm					
Surface water quality monitoring	• Biannually – once at end of wet season and once at end of dry season; • 24 hours of a release; • Weekly during natural flow events; and • Continue until relinquishment.				• Monitoring of surface waters is to continue as per the initial monitoring phase. To achieve the PMLU, water quality of the rehabilitated runoff dam is to meet the stock drinking water guidelines of the ANZESCC 2000.
Groundwater monitoring	• Groundwater level monthly; • Groundwater quality quarterly; and • Continue until relinquishment.				• The existing groundwater monitoring network will be sampled in accordance with the Queensland Monitoring and Sampling Manual or appropriate Queensland Government guideline. Groundwater samples will be collected and analysed to achieve milestone

					criteria. A revaluation of the groundwater monitoring requirements will be undertaken at major monitoring events.
Self-Sustaining					
Vegetation Monitoring	Annually	Once	Once	At relinquishment or until milestone met	• Species used in revegetation remain present and show evidence of natural recruitment. Evidence of flora recruitment from rehabilitation monitoring data. • Total groundcover ≥ 50%.
Topsoil Depth	After topsoil application				• At least 0.15 m in rehabilitated areas.
Soil Quality Monitoring	Once prior to application				• Representative soil testing of growth media confirms: (a) pH 5.6-8.5; (b) Colwell P >10 mg/kg; (c) Organic matter ≥1%; (d) EC (saturated extract) <1 dS/m; (e) ESP <6%; and (f) Emerson Aggregate Test (EAT) ≥4.
Weather monitoring	Monthly	Monthly	Monthly	Monthly until relinquishment	• Weather trends and events that may impact the success of rehabilitation are identified.

8.1.1 Rehabilitation Milestones

Rehabilitation milestones have been identified for each significant event necessary to rehabilitate the land to a stable condition. Completion criteria are used to determine if rehabilitation milestones have been achieved and ultimately shows if the mining domain has been rehabilitated to a point that the Final Landform PMLU has been achieved at surrender. The Rehabilitation Milestones (RM) and the completion criteria for each milestone are defined in **Table 9-2**.

8.1.2 Rehabilitation Area Milestone Monitoring and Schedule

To achieve the RMs, MMs and in turn PMLUs and NUMAs set for the Project, a combination of rehabilitation monitoring and reporting will be required to demonstrate rehabilitation and management successes.

8.1.3 Rehabilitation Monitoring Phases

The Rehabilitation Monitoring Program has been designed to demonstrate that rehabilitation milestones have been achieved. There are three main phases to the Project's rehabilitation monitoring program as displayed in **Figure 8-1**.

A regular monitoring program is to be designed to determine the success of rehabilitation activities, and act as a warning system to rehabilitation failures.

Rehabilitation monitoring has previously been undertaken on site. However, this was suspended when the site was placed under care and maintenance. The Project will look at reinstating this monitoring program to further the understanding of previous rehabilitation attempts, and guide future activities.

The success of rehabilitated areas will be determined by continued progression, stability, and self-sustainability. A rehabilitation acceptance criterion will be developed based on these principles.

Early detection and correction of issues that would otherwise grow and lead to rehabilitation failure can be undertaken during the initial monitoring program. Initial monitoring will occur at newly established rehabilitation monitoring sites to observe the success, identify risks, and develop baseline data.

The elements of rehabilitation that will be assessed during this program are:

- Landform and erosion;
- Soils;
- Vegetation; and
- Groundwater.

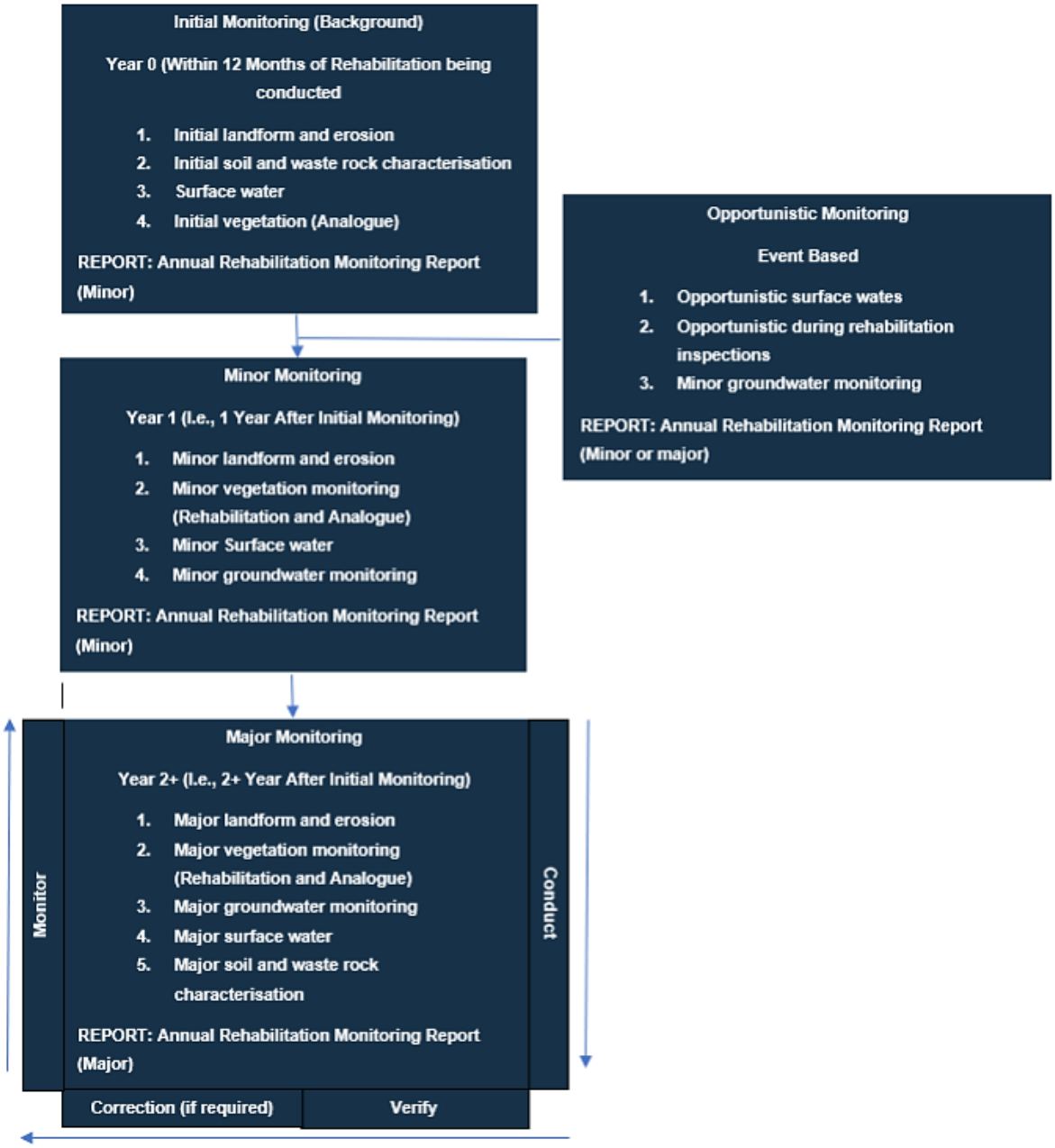


Figure 8-1 Wirralie Rehabilitation Monitoring Phases

8.1.4 Major Monitoring Methods

The purpose for the major monitoring is to provide assess in detail the performance of the rehabilitation program this includes identifying risks to success, evaluating the progress, and evaluating the PMLU.

The points to be monitored will continue from the previous phases as well as any additional erosion areas identified during monitoring. The focus of the major monitoring includes:

- Landform and erosion;
- Soil and spoil;
- Vegetation;
- Grazing Land Suitability Assessment; and
- Groundwater.

8.1.5 Desktop Monitoring

The major monitoring will involve desktop monitoring prior to on-site monitoring work. Through the use of LiDAR and aerial imagery, the following can be gained:

- An understanding of historic conditions through a review of previous monitoring reports;
- Update the Digital Elevation Slope Model and compare against previous models to detect changes;
- Identify new areas of erosion for field validation.

8.1.6 Landform and Erosion

The focus will be towards assessing erosion at previous monitoring locations as well as any other areas identified during desktop monitoring.

Erosion at the monitoring sites is assessed through visual assessment over time. Assessment is undertaken by traversing the transect on foot and recording the number and average depth of any erosion features or rill lines. Erosion is measured along a 100 m transect. Erosion features or indicators that will be recorded, if identified, include wind or sheet erosion, erosion rills, gullies or tunnels, or signs of slumping.

When rills (<30 cm) and gullies (>30 cm) are observed along the 100 m transect then the area of erosion intercepting the 100 m transect will be calculated using the line intercept method, to understand the proportion of disturbance at each monitoring location.

The total number of rills will be counted at each monitoring location to determine rill severity, refer to **Table 8-2**. The overall classification of the erosion on each transect is determined by the higher classification attributed to either the number of rills/gullies or the average depth.

Table 8-2 Erosion Classification Framework

Erosion Classification	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope	Loss of surface horizon; subsoil exposure; root exposure; substantial soil deposits downslope.
Rills/Gullies*	Occasional Rills	Common rills	Numerous rills forming corrugated ground surface
Tunnel erosion	Absent	Absent	Present
Mass movement	Absent	Absent	Present

Erosion definitions: NCST (2024) Australian Soil and Land Survey Field Handbook, 4th edition. The National Committee on seepage and Terrain. CSIRO Publishing, Collingwood, Australia. *Rill frequency assessed on the contour over entirety of rehabilitation area (not only features that intersect a monitoring transect).

8.1.7 Soil and Spoil

The major monitoring will follow the procedures, sampling, and analysis of the initial program. The data can be compared to the baseline data to evaluate the rehabilitation performance as well as identify trends. The data will indicate the level of achievement or if remediation action is required.

8.1.8 Vegetation

Acceptance criteria are rehabilitation performance goals presented as criterion completion scores for relevant attributes of vegetation. They provide measures: to which rehabilitation progress can be compared to determine success of the rehabilitation; to identify the need for intervention and management actions; and by which rehabilitated land is deemed to be complete. Rehabilitation achieving these criterion for a period of three years could be considered self-sustaining and likely to persist in the long term and may be deemed to be complete in accordance with the conditions of the EA.

8.1.9 Surface Water

Monitoring of surface waters is to continue as per the initial monitoring phase. Water Quality during the major rehabilitation monitoring phase is to show a significant improvement in water quality. To achieve the PMLU, water quality of the rehabilitated runoff dam is to meet the stock drinking water guidelines of the ANZECC 2000.

8.1.10 Receiving Environment

A receiving environment monitoring program (REMP) is being developed for the Project, and will include biannual aquatic ecology sampling, in alignment with relevant guidelines (Department of Natural Resources DNR, 2001) (Department of Environment and Science, 2014). Personnel conducting REMP will be appropriately trained in AusRivAs (2001).

8.1.11 Groundwater

The existing groundwater monitoring network will be sampled in accordance with the Queensland Monitoring and Sampling Manual or appropriate Queensland Government guideline. Groundwater samples will be collected and analysed to achieve milestone criteria. A revaluation of the groundwater monitoring requirements will be undertaken at major monitoring events.

8.2 Rehabilitation and Closure Maintenance and Management

A range of maintenance and management activities may be required in rehabilitated areas to facilitate achievement of defined success criteria. Rehabilitation areas should be monitored at an early stage and results compared to success criteria. Areas that do not meet the defined success criteria should have maintenance activities completed to facilitate achievement of the success criteria. These activities are further outlined below in **Table 8-3**.

Table 8-3 Maintenance and Management Program

Aspect	Management	Possible Maintenance Action
Vegetation	• Identify vegetation cover and compare with indicators on trajectory to meeting milestone completion criteria. • Manage grazing areas to prevent overgrazing, i.e., correct stocking rates / rotational system depending on maturity of system. • Check for dormancy. • Vegetation assessment to determine if completion criteria (cover, diversity, vitality, etc.) are predicted to be met.	• Apply additional ameliorants if required based on soil analysis. • Re-seed areas if soil quality is ameliorated. • Re-seed with selected species if diversity is not acceptable. • Stimulate growth with controlled grazing. • Increase roughness of surface or mulch layer to trap seeds. • Re-planting in some areas where vegetation establishment is limited.
Erosion	• Monitor extent and severity of erosion and determine causes – do not repair erosion if activity will cause excessive additional disturbance – allow another season to monitor the progression or stabilisation of small-scale erosion. • Identify unwanted concentration of runoff over large areas.	• Small rill erosion – selected branch or rock packing. • Gullies – backfill where needed by borrowing from surrounds or reshape using small earthworks equipment; use coarse material for backfilling. • Large gullies – import material to backfill from stockpiles or borrow pits; if required, construct water control structures. • Reinstate / upgrade water control structures. • Spread runoff where concentration occurs. • Improve vegetation cover.
Sediment Control	• Monitor and inspect sediment control. • Evaluate the need for de-silting in view of stabilisation of rehabilitated areas and buffer capacity of sediment control structures. • Inspect sediment control structures especially after intense rain events.	• De-silt sediment control structures where capacity has been compromised – place silt on areas that is not subject to erosion, ameliorate and vegetate. • Construct new sediment control structures where needed. • Re-route runoff based on evaluation of drainage pattern after rehabilitation. • Repair upstream erosion.

		• Improve vegetation cover.
Water Control Structures (e.g., berms, graded banks)	• Identify reduced capacity due to sedimentation. • Check for vertical alignment, i.e., uneven settlement or consolidation causing low areas. • Check for long-term stability, e.g., scouring. • Check condition of low-lying areas that were constructed on the top of dumps and other flat areas.	• Remove sediment from sediment traps. • Repair damages to berms or channels. • Revisit Surface WMP after evaluation of drainage pattern after rehabilitation and construct additional structures where needed or remove is no longer required/functional.
Weed Management	• Continue with weed control programme.	• Annual weed inspections and mapping. • Weed control with selected herbicides appropriate to the area concerned (e.g., rehabilitated areas vs. firebreaks). • Bush encroachment control follow upon previously cleared areas. • Thin out undesirable species where it may impact / affect grass cover. • Mowing / slashing periodically as removing biomass repeatedly causes reduced vigour in many weed species. Use in combination with herbicides. • Weed removal using mechanical methods (e.g., weed wrench or root talon).
Feral Animal Management	• Identify feral animals that can affect rehabilitated areas.	• Implement feral animal control plan. • Liaise with neighbouring stakeholders and / or applicable government agencies, where needed, to address the cause of the problem.
Fire Management	• Maintain firebreaks.	• Maintaining firebreaks on boundaries. • Vegetation control along firebreaks. • Clear firebreaks mechanically where needed.
Land Stability	• Monitor land stability.	• ESC structures are appropriately maintained.

8.3 Rehabilitation Trials

There are no rehabilitation trials planned for WGM.

9.0 PRCP Schedule

The PRCP schedule will become a statutory instrument once approved by DETSI. The purpose of the PRCP schedule is to set timeframes for completing rehabilitation and closure. The breakdown for how the proposed PRCP schedule has been developed is outlined below. The proposed PRCP Schedule for WGM is provided in **Appendix M.**

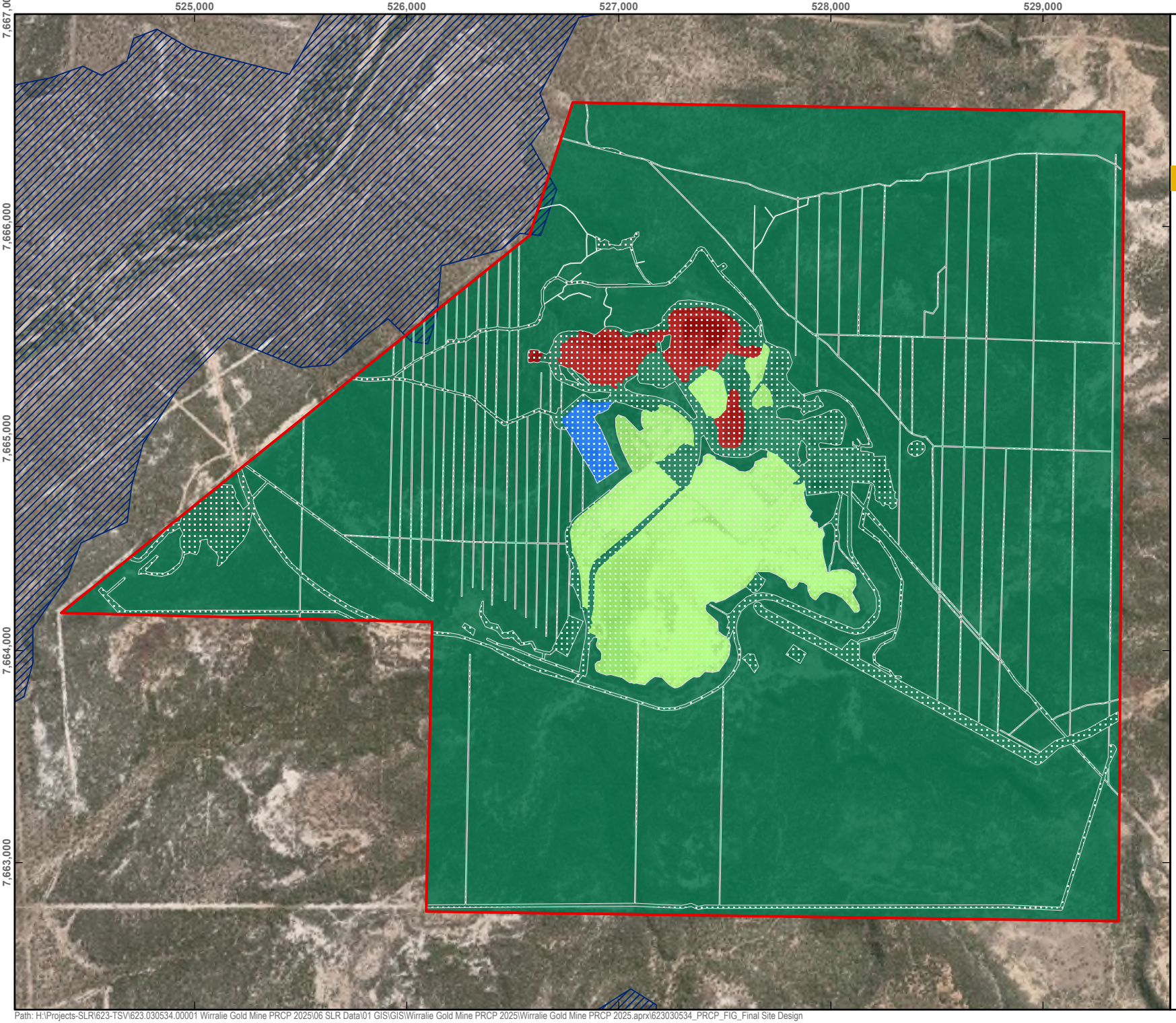
This PRCP schedule includes:

- A PMLU or NUMA for all land within the relevant resource tenures, including undisturbed land;
- Identification of when land becomes available for rehabilitation or improvement;
- Rehabilitation milestones to achieve the PMLU outcomes;
- Milestone criteria that demonstrate when each milestone has been completed; and
- Completion dates for each milestone to be achieved.

9.1 Final Site Design

The final site design for the WGM is shown in **Figure 9-1** and includes the following features:

- The maximum disturbance footprint as permitted under the EA EPML00772413;
- ML1079;
- The PMLUs for the WGM area; and
- 0.1 % AEP flood extent.



WIRRALIE GOLD MINE
PROGRESSIVE REHABILITATION AND CLOSURE PLAN

FINAL SITE DESIGN

FIGURE 9-1

LEGEND

- Mining Lease
- Maximum Disturbance Footprint
- Flood Assessment Overlay
- NUMA

Post Mining Land Use

- Water Storage
- Low Intensity Grazing
- Grassland

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
Drawn by:	AS

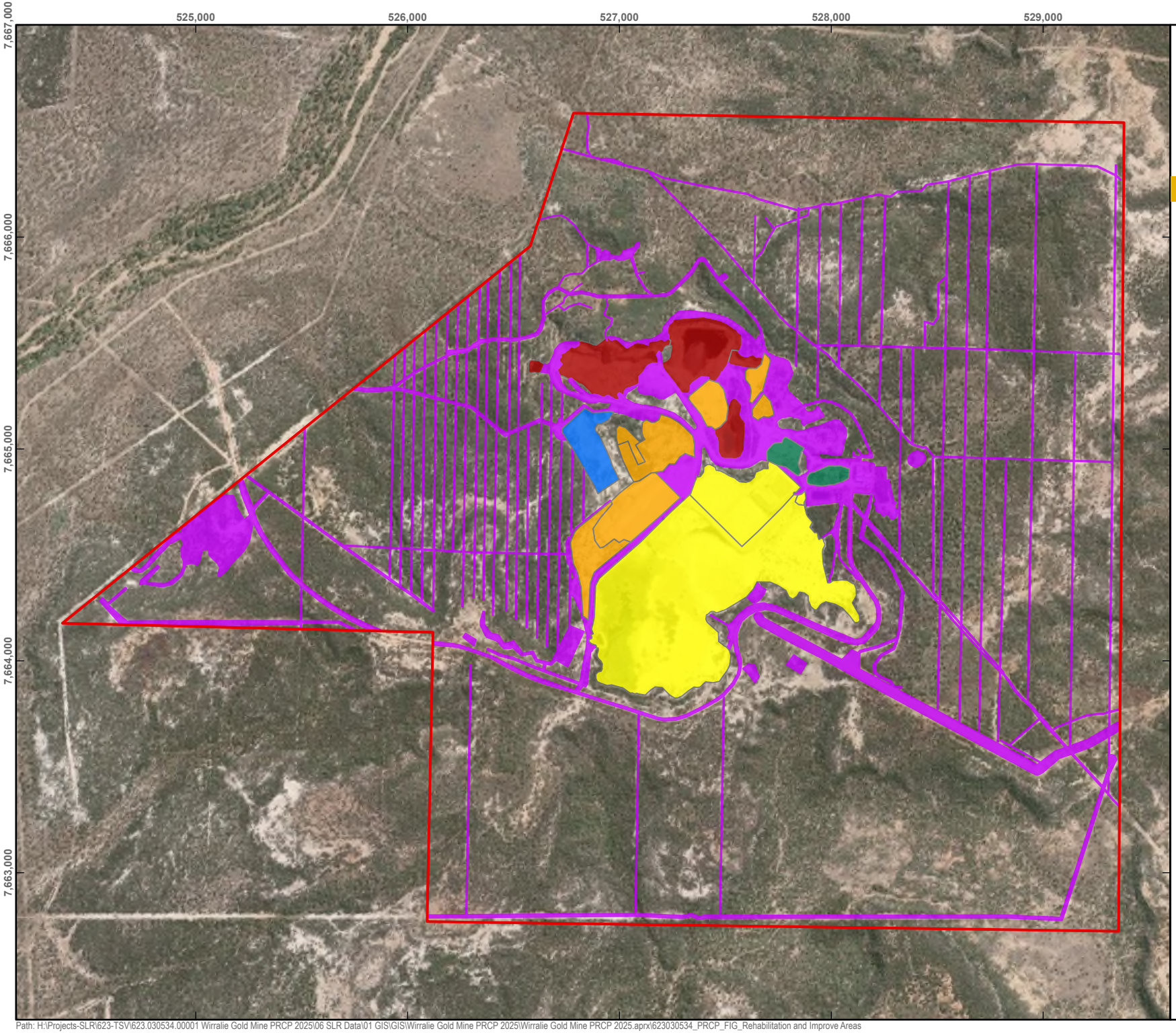
Path: H:\Projects-SLR\623-TSV\623.030534.00001 Wirralie Gold Mine PRCP 2025\06 SLR Data\01 GIS\GIS\Wirralie Gold Mine PRCP 2025\Wirralie Gold Mine PRCP 2025.aprx\623030534_PRCP_FIG_Final Site Design

9.2 Rehabilitation/ Improvement Areas

A Rehabilitation Area (RA) is defined in the EP Regulation as an area of land in the PMLU to which a rehabilitation milestone for the PMLU relates. WGM has two PMLUs comprising of grazing and native bushland. The five residual voids will be NUMAs. The applicable rehabilitation methodology and milestones have been used to identify different rehabilitation areas. The WGM PRCP rehabilitation areas are detailed in **Table 9-1** and shown in **Figure 9-1**.

Table 9-1 Rehabilitation and Improvement Areas

RA/ IA	Relevant Activity	Total Area (ha)	PMLU
RA1	Infrastructure, Stockpile Areas, Village and Exploration Areas	121.4	Low Intensity Grazing
RA2	Processing Plant and ROM Pad	3.3	Low Intensity Grazing
RA3	Waste Dumps	24.1	Grassland
RA4	Tailings Storage Facility and Heap Leach	73.6	Grassland
RA5	Runoff Dam	5.4	Water Storage
IA1	Pit A, Pit B, North Pit, Deep Lead Pit and Blinky Pit	22.2	NUMA
Total		**250.0**	



WIRRALIE GOLD MINE
PROGRESSIVE REHABILITATION AND CLOSURE PLAN

REHABILITATION AND IMPROVEMENT AREAS

FIGURE 9-2

LEGEND

- Mining Lease

Rehabilitation and Improvement Areas

- IA1
- RA1
- RA2
- RA3
- RA4
- RA5

0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:24,000 at A4
Project Number:	623.030534.00001
Date Drawn:	08-Apr-2026
Drawn by:	AS

Path: H:\Projects-SLR\623-TSV\623.030534.00001 Wirralie Gold Mine PRCP 2025\06 SLR Data\01 GIS\GIS\Wirralie Gold Mine PRCP 2025\Wirralie Gold Mine PRCP 2025.aprx\623030534_PRCP_FIG_Rehabilitation and Improve Areas

9.3 Milestones and Milestone Criteria

RMs and the associated criteria have been developed using the information presented in the PRCP. These milestones have been reflected in the proposed PRCP schedule and are shown in **Table 9-2**. Criteria for rehabilitation improvement areas (NUMAs) are shown in **Table 9-3**.

Table 9-2 PRCP Rehabilitation Milestone Criteria

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
RM1	Infrastructure Decommissioning and Removal	1 year	1.1 With the exception of any infrastructure to remain as part of the post-mining land use (PMLU) or to be retained under landholder agreement, the following are complete: (a) All services disconnected and removed; (b) All buildings and associated infrastructure dismantled and removed offsite. (c) All hardstand, concrete areas and roads (bitumen, blue metal, aggregate etc.) removed. (d) All fencing and associated foundations removed. (e) All pipelines drained and removed. (f) All waste not authorised to be disposed of on-site under EA EPML00297613 removed. (g) All drillholes, bores, sediment ponds and sumps decommissioned. (h) All machinery and equipment, not required for rehabilitation works removed from site. (i) For dams: i. Where present, liners are removed; ii. All contaminated sediment has been removed; and iii. Earthworks are completed to decommission dam walls.	The criteria proposed for this milestone is consistent with the steps undertaken as part of the infrastructure decommissioning process.

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
			1.2 Below-ground infrastructure and services deeper than 0.5m in relation to the final landform surface may be retained provided: (a) All pipelines have been drained and capped or filled with inert material; and (b) All below-ground infrastructure to be retained is mapped; and (c) The intended PMLU is not compromised; and (d) There is no ongoing risk of environmental harm. 1.3 Confirm that for exploration bores, water monitoring bores, dewatering bores and bores with diameter up to 300 mm): (a) Boreholes grouted and/or plugged. (b) Boreholes capped 0.5 m below surface. 1.4 Decommission of exploration bores completed in accordance with 'Eligibility Criteria and Standard Conditions for Exploration and Mineral Development Projects'.	
RM2	Identification and remediation of contaminated land	2 year	2.1 Complete a preliminary site investigation (PSI), where required. 2.2 Where the PSI completed under criterion RM2.1 identifies contamination is present, or is likely to be present, and said contaminated material is likely to result in a risk to human health or cause environmental harm, a detailed site investigation (DSI) is required to be completed. 2.3 Where contaminated material is identified, all contaminated material is either: (a) Remediated.	The criteria proposed for this milestone is consistent with the steps undertaken as part of the contamination investigation and remediation processes.

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
			(b) Removed and disposed of at a licenced facility; or (c) Disposed of as per the Contaminated Land Investigation Document (CLID) and Site Management Plan (SMP). 2.4 The site suitability statement states the land is not contaminated land and is not unsuitable for the proposed PMLU. 2.5 Auditor certifies, as per Environmental Protection Act 1994 (EP Act) (Qld), that all contaminated materials have been remediated, or removed and disposed of and the land is suitable for the PMLU. 2.6 Land is removed from Environmental Management Register if applicable.	
RM3	Landform Development and Reshaping/Reprofiling	2 year	All major earthworks (including reshaping, pushing/trimming) are completed in accordance with the design specification provided by an AQP. 3.1. No slope exceeds 15% gradient for WRDs (RA3). 3.2. Installation of erosion and sediment control systems to design and certified by an AQP.	This criterion is consistent with the methodology proposed in the PRCP.
RM4	Installation and certification of TSF cover System/ cap on WRD	2 year	4.1 Installation of cover system comprises: a) 1.0 m benign waste rock; and b) ≥ 0.15 m of growth media. 4.2 Cover system design and performance criteria based on level of environmental risk has been developed by an independent AQP. 4.3 The cover system has been installed as per design. 4.4 All PAF material is located at least 2.0 m below the final surface.	This criterion is consistent with the methodology proposed in the PRCP.

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
RM5	Surface Preparation	1 year	5.2 Assessment of growth media characteristics and the development of an amelioration and physical treatment plan is completed by an AQP. 5.3 Ameliorant and physical treatments such as fertiliser, lime, gypsum and/or organic matter are applied as identified in criteria RM5.1. 5.4 Topsoil or growth media placed at a depth ≥ 0.15 m. 5.5 Following amelioration as per RM5.1 and 5.2, representative soil testing of growth media confirms: (a) pH 5.6-8.5; (b) Colwell P >10 mg/kg; (c) Organic matter ≥1%; (d) EC (saturated extract) <1 dS/m; (e) ESP <6%; and (f) Emerson Aggregate Test (EAT) ≥4. 5.6 If topsoil or growth media does not meet the requirements specified in RM5.4, an AQP must assess the results to determine whether the material is suitable for the PMLU or whether additional amelioration is required. If additional amelioration is required, it must be completed in accordance with the AQP's recommendations.	This criterion is consistent with the methodology proposed in the PRCP.
RM6	Revegetation	1 year	6.1 PMLU Light Grazing - seeding completed using with a selection of species and application rates described in Table 6-20 of the PRCP. 6.2 PMLU Grassland - seeding completed using with a selection of species and application rates described in Table 6-20 of the PRCP.	This criterion is consistent with the methodology proposed in the PRCP and the requirements of the LOD.

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
			6.3 Livestock are excluded from newly seeded areas via physical or virtual fencing.	
RM7	Water management in the final landform	2 years	7.1 All dams, which are to remain as part of the PMLU, comply with the following: (a) Safely accessible by humans and livestock; (b) All contaminated sediment has been removed.	Proposed criteria with the objective to demonstrate the landform has achieved a stable condition.
RM8	Achievement of PMLU to a stable condition	10 years	8.1 Species used in revegetation remain present and show evidence of natural recruitment. Evidence of flora recruitment from rehabilitation monitoring data. 8.2 Weed presence is <10% of total vegetative groundcover. 8.3 No evidence of erosion classified as 'moderate' or 'severe' as defined by PRCP **Table 8-2 Erosion classification framework**. 8.4 Certification by an AQP that the land has achieved stable condition. 8.5 Total groundcover ≥ 50%. 8.6 Surface and groundwater quality is comparable with pre-mining water quality and EA and ANZECC water quality guideline for livestock drinking. **Grazing PMLU (RA1 & RA2)** 8.7 Species diversity of at least 5 (per hectare (averaged)): a) At least 3 palatable, perennial, and productive (3P) species.	Proposed criteria with the objective to demonstrate the landform has achieved a stable condition.

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
			Grassland PMLU (RA3 & RA4) 8.8 Species diversity of at least 5 (per hectare (averaged)): a) 3 native groundcover species. **Water Storage (RA5)** 8.9 Must meet ANZECC 2000 livestock drinking water no adverse effects guidelines for beef cattle (electrical conductivity is ≤5,970µS/cm) during the wet season (November to April). 8.10 Safely accessible by humans and livestock.	

Table 9-3 Improvement Area Milestones

Milestone Reference	Rehabilitation Milestone	Approximate Timeframe for Completion	Milestone Criteria	Criteria Justification
MM1	Achievement of safety requirements	5 years	1.1 Safety bund setback distance located where determined by an AQP. 1.2 Bunding constructed in accordance with the Department of Industry and Resources (1997) Guideline safety bund walls around abandoned open pit mines or as recommended by AQP and confirmed to be geotechnically stable by an AQP. 1.3 Fencing erected, where required, to prevent access to the residual void, around the perimeter of the safety bund. 1.4 Safety signs erected at 100 m intervals along the fence clearly warning of a safety risk and prohibiting public access. Signs are to comply with Australian Standard AS 1319:1994 – Safety Signs for the Occupational Environment. 1.5 Geotechnical investigations of the high walls demonstrates geotechnical stability has been achieved. 1.6 All highwalls achieve a FoS >1.5 and certified by an AQP.	Proposed criteria with the objective to demonstrate the NUMA has achieved safety requirements.
MM2	Achievement of sufficient improvement	5 years	2.1 Residual voids must not overtop. 2.2 Voids retain flood immunity for a 0.1% AEP event. 2.3 Groundwater and void lake monitoring / modelling confirms that the voids act as a sink. 2.4 No NUMA will cause environmental harm outside of the tenure boundaries.	Proposed criteria with the objective to demonstrate the NUMA has achieved sufficient improvement.

9.4 Available for Rehabilitation and Completion Timeframes

Available for rehabilitation is defined in section 126D of the EP land Act as land that is no longer being mined, unless:

- The land is being used for operating infrastructure or machinery for mining, including, for example, a dam or water storage facility;
- The land is identified in the proposed PRCP schedule as containing a resource to be mined within 10 years after the land would otherwise have become available for rehabilitation;
- The land is required for the mining of probable or proves ore reserve mentioned in paragraph; and
- The land contains permanent infrastructure identified in the proposed PRCP schedule as remaining on the land for a PMLU.

Rehabilitation areas will be progressively available throughout the LOM and once mining has ceased. The general timing has been based on the internal mine planning and available resources.

Rehabilitation areas at WGM will progressively become available throughout the LOM and once mining on site has ceased. The general timing for when rehabilitation areas become available has been based on the internal mine planning and available resources (e.g., equipment). The dates and areas for when land becomes available for rehabilitation are outlined in the PRCP Schedule in **Appendix M.**

The completion dates have been based on when land becomes available and the estimated amount of time to achieve each milestone. The proposed PRCP Schedule is provided in **Appendix M**.

The timing of when these milestones will be achieved must also be considered for rehabilitation to be completed effectively and efficiently. For example, seeding should take place at the end of the year before the wet season and ideally is done soon after the application of topsoil. Milestones should also be aligned to maximise efficiency, where possible.

Rehabilitation will commence as soon as reasonably practical and, therefore, rehabilitation milestones should be able to be completed as per the proposed PRCP Schedule.

9.5 Conditions

Solomons propose inclusion of the following PRCP conditions:

Surface Water Monitoring and Quality Limits

The holder must, by 30 April 2037, submit a report to the administering authority that:

- Proposes a revised surface water monitoring network for inclusion in Surface Water Monitoring Locations table;
- Proposes surface water quality limits for inclusion in Surface water quality limits table based on at least 5 years of site-specific data.

Groundwater Monitoring and Quality Limits

The holder must, by 30 April 2037, submit a report to the administering authority that:

- Proposes a revised groundwater monitoring network for inclusion in Groundwater monitoring locations table;
- Proposes groundwater quality limits for inclusion in Groundwater quality limits table based on at least 5 years of site-specific data.

Geotechnical Assessment of Residual Voids

A void geotechnical stability assessment report must be developed by an appropriately qualified person and submitted to the administering authority two (2) years prior to closure.

The void geotechnical stability assessment report must include the following:

- Proposed final slope angles of high wall, low wall and end walls of each final void;
- Assessment of pit wall stability, considering long-term erosion and weathering of the pit wall and the effects of significant hydrological events;
- Identification of void abandonment zones where the factor of safety is <1.5;
- Details of the methodology and results of the stability analysis;
- Mechanisms for achieving acceptable geotechnical stability;
- Consideration of any relevant underground mining or nearby surface infrastructure;
- Recommendations for safety bund design or exclusion infrastructure; and
- Any recommendations for ongoing monitoring, if required.

Exploration and Ancillary Activities

Disturbance due to exploration and minor ancillary activities in areas not planned to be mined and not within a Rehabilitation Area in this Schedule must be rehabilitated in accordance with the provisions detailed in the 'Eligibility criteria and standard conditions for exploration and mineral development projects' or its successor, with the exception that land must be rehabilitated to a stable condition which includes achieving the relevant post mining land use for the disturbance location as detailed in **Figure 9-1– Final Site Design Map**.

10.0 References

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Appendix A EA (EPML00772413) 24 March 2026

Appendix B Soil and Land Suitability Assessment

Appendix C Community Consultation Management Plan

Appendix D Flood Hazard Overlay Assessment

Appendix E Vegetation Survey Report

Appendix F Wirralie TSF Rehabilitation Strategy

Appendix G Wirralie Gold Mine Waste Rock Characterisation

Appendix H Hydrogeology Report

Appendix I Wirralie Gold Mine Concept Closure Methodology and Water Balance Model

Appendix J Waste Rock Characterisation Supporting Letter - Cadmium and Selenium

Appendix K Waste Rock Characterisation Supporting Letter – Salinity

Appendix L PRCP RFI Erosion Modelling

Appendix M PRCP Schedule v3.0