



3 Water Street Red Hill 4059
T: +61 7 3368 1033
E: information@ardent-group.com.au
W: ardent-group.com.au
ABN: 38 609 696 764

Progressive Rehabilitation and Closure Plan – Chum Street Pty Ltd

Title of the Project: Claypave

Tenure Numbers: ML 4553, ML 4559, ML 4714, ML 50077

EA Number: EPML00634213

EA Holder Name: Chum Street Pty Ltd

EA Holder Contact Details: c/- Ardent Group Pty Ltd, PO Box 320, Red Hill QLD 4059

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Ardent Group Pty Ltd	
Street Address:	3 Water Street, Red Hill Qld 4059
Postal Address:	PO Box 320 Red Hill Qld 4059
Phone:	+61 7 3368 1033
Email:	Information@ardent-group.com.au
Web:	www.ardent-group.com.au

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Title:	Progressive Rehabilitation and Closure Plan – Chum Street Pty Ltd		
Project Manager:	Joanne Salmon		
Author:	Joanne Salmon/Tommi Mason		
Client:	Chum Street Pty Ltd		
Client Contact:	Con Bassili		

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Appendices

Appendix 1 – PRCP Schedule

Appendix 2 – EPML00634213 – Land Outcome Document

Abbreviations

AQP	Appropriately Qualified Person
AS	Australian Standard
CBR	California Bearing Ratio
CLR	Contaminated Land Register
EA	Environmental Authority EPML00634213
EMR	Environmental Management Register
EP Act	<i>Environmental Protection Act 1994</i>
ESC	Erosion and Sediment Control
ERA	Environmentally Relevant Activity
ICC	Ipswich City Council
ML	Mining Lease
NUMA	Non-use Management Area
PI	Plasticity Index
PMLU	Post-mining Land Use
PoO	Plan of Operations
PRCP	Progressive Rehabilitation and Closure Plan
RE	Regional Ecosystem

PART A – REHABILITATION PLANNING PART

1. INTRODUCTION

1.1 Background

Ardent Group Pty Ltd (Ardent Group) has been engaged by Chum Street Pty Ltd (Chum Street) to prepare a transitional Progressive Rehabilitation and Closure Plan (PRCP) for the “Claypave” Project (the Project) in accordance with the requirements of the *Environmental Protection Act 1994* (EP Act).

This transitional PRCP is applicable to Mining Leases (ML) 4553, 4559, 4714, 50077. The current version of the Environmental Authority EPML00634213(EA) was issued to Chum Street, the owner and operator of the Project, on 14 December 2018.

The EA authorises carrying out Environmentally Relevant Activity (ERA) 20(a) under Schedule 3 of the *Environmental Protection Regulation 2019*: “clay pit mining, dimension stone mining or mining gemstones (including the material from which gemstones are extracted) - at least 5,000t but not more than 100,000t in a year”.

The Project is located at Ebbw Vale and New Chum, approximately 7km east of Ipswich, in South East Queensland and is accessed via the former brickworks operation located at 1 Chum Street. No mining is planned to occur, with rehabilitation works having commenced in 2023 to facilitate the final land use outcomes specified in the environmental authority, as detailed in section 4.

1.2 Purpose of the PRCP

In accordance with the stated purpose outlined under Section 126B of the *Environmental Protection Act 1994* (EP Act), the PRCP:

- (a) specifies a plan for how and where environmentally relevant activities will be carried out on land in a way that maximises the progressive rehabilitation of the land to a stable condition; and
- (b) provides for the condition to which the holder must rehabilitate the land before the authority may be surrendered.

This PRCP has been prepared to address the requirements of Sections 126C and 126D of the EP Act and has been prepared in accordance with the *Guideline Progressive Rehabilitation and Closure Plans (PRC Plans)* (DES 17 March 2021).

The PRCP comprises two parts:

Part A – Rehabilitation Planning Part, which includes the following:

- Provide a description of:
 - each resource tenure, including the area of each tenure, that applies to the PRCP.
 - the relevant activities to which the application relates.
 - the likely duration of the relevant activities.
- A description of how and where the mining activities will be carried out.
- Details of consultation undertaken in relation to the preparation of the PRCP and ongoing consultation in relation to any required rehabilitation required under the PRCP.

- Details of how the proposed Post-Mining Land Uses ('PMLUs') are consistent with community consultation and relevant plans for the land of the local government, the State and Commonwealth.
- Proposed methods and techniques for rehabilitating the land to a stable condition in a way that supports the rehabilitation milestones under the proposed PRCP Schedule.
- Identifies any risks of a stable condition for land not being achieved and specifies methods to manage or minimise the identified potential risks.

Part A is to justify and support the proposed PRCP Schedule.

Part B – PRCP Schedule, which includes a proposed PRCP schedule that complies with section 126D of the EP Act and includes the following:

- Nomination of either a PMLU or NUMA for all land within the relevant resource tenures, including land uses for undisturbed land.
- Identification of when land becomes available for rehabilitation or improvement.
- Rehabilitation or management milestones to achieve the PMLU or NUMA outcomes.
- Milestone criteria that demonstrate when each milestone has been completed.
- Completion dates for each milestone to be achieved.
- Any conditions considered necessary or desirable.

The PRCP schedule becomes a legally binding and enforceable instrument with which the Project must comply.

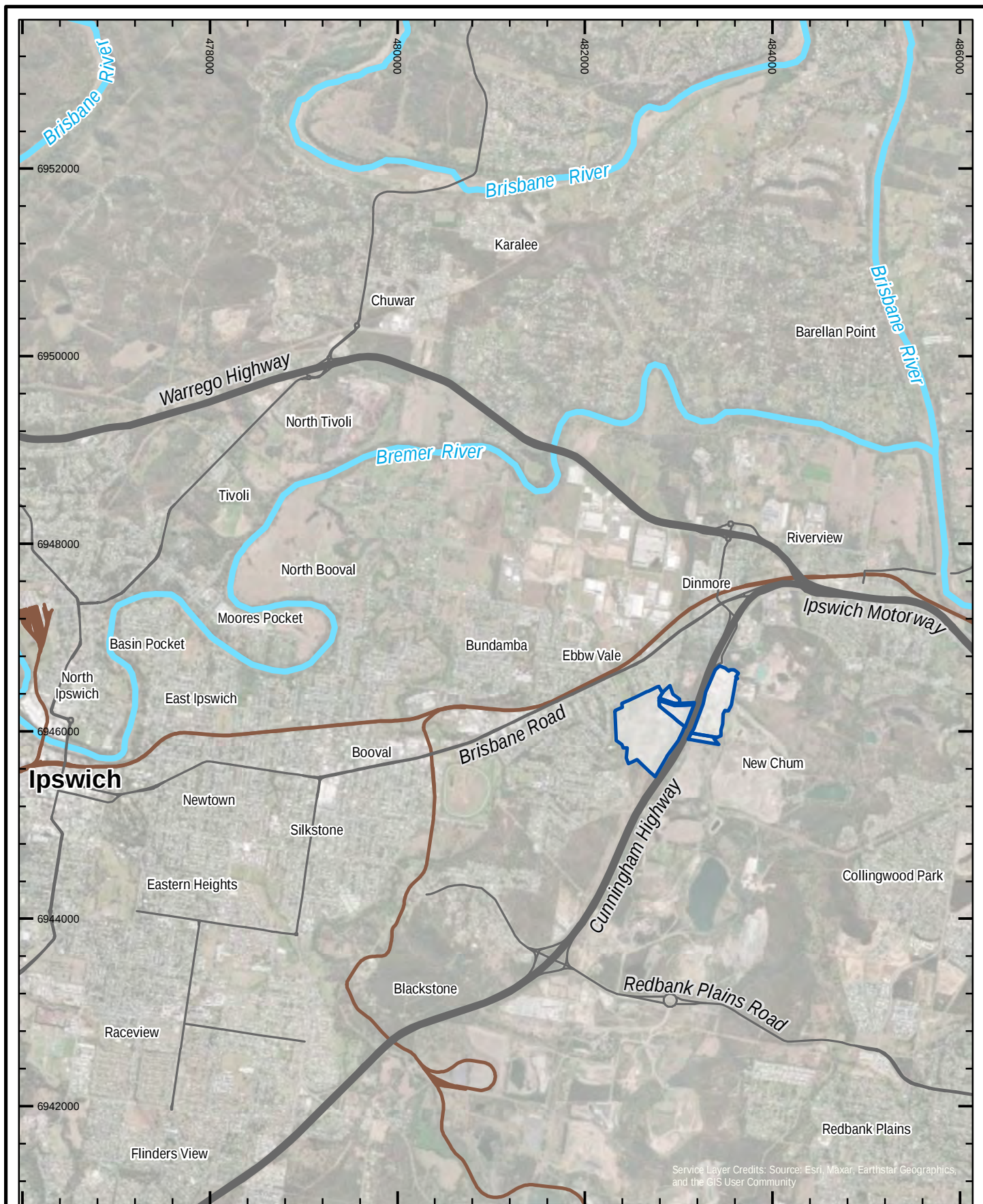
1.3 Land Outcome Document for the PRCP

Environmental Authority EPML00634213 dated 14 December 2018 is the Land Outcome Document (LOD) for this PRCP.

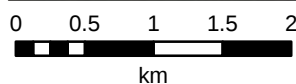
2 Background Information

2.1 Location

The Project is comprised of ML 4553, ML 4559, ML 4714 and ML 50077, located in Ebbw Vale and New Chum, approximately 7km east of Ipswich (Figure 1). The Project is located within several land parcels, as shown in Figure 2 and detailed in section 2.3.



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New Chum



GDA2020, MGA Zone 56



Regional Location

Drawn By: Chris Schlebusch

Requested by: Joanne Salmon

Date: 18/03/2024

Legend

- Mining Lease Boundary
- Highway
- Secondary Road
- Major Watercourse
- Rail Network

Sheet No.

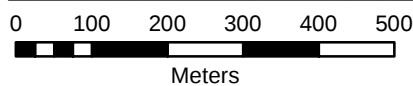
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CHUM STREET PTY LTD
Chum Street

GDA2020, MGA Zone 56



Mining Leases and Property Boundaries

Drawn By: Chris Schlebusch
Requested by: Jacob Arnold
Date: 9/09/2022

Legend

- ML boundary
- Property boundary
- Easement
- Reserve
- Road parcel

Figure 2

Sheet No.

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Data sources: ©State of Queensland, Department of Resources

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2.2 Tenure to which PRCP relates

Details of the ML, which is the subject of this PRCP, are outlined in Table 1. This PRCP applies to the entire area of this tenure.

Table 1: Mining Tenement Details ML 4553, ML 4559, ML 4714, and ML 50077

Specifications		Details			
Environmental Authority		EPML00634213			
Tenement name		-	-	New Chum	Claypave F
ML Number		ML 4553	ML 4559	ML 4714	ML 50077
Grant Dates		01/08/1950	05/12/1974	01/06/1989	10/02/1994
Expiry Dates		31/07/2034	31/12/2026	30/06/2024	28/02/2019
Area	Public enquiry Report	24.79 ha	43 ha	2 ha	2.025 ha
	Qld State Shapefile Area	24.79 ha	43 ha	2 ha	2.025 ha
Minerals		Clay – Brick Clay Clay – Pottery/ White Ware Shale	Clay – Brick Clay	Clay – Brick Clay Shale	Clay – Brick Clay Clay – Fire Clay Shale

2.3 Property Description

The Project is located within multiple lot and plan parcels. The real property description and current ownership is provided in Table 2.

Table 2 Real Property Description Underlying ML 4553, ML 4559, ML 4714 and ML 50077

Lot on Plan	Tenure Type	Landholder	Local Government Area	Underlying Land Parcels
ML 4553				
Lot 2 on SP207444	Freehold	Chum Street Pty Ltd	Ipswich City Council	Lot L on SP152146 Lot C on SP207444
Lot 271 on SP207443	Freehold	Chum Street Pty Ltd		-
Lot 273 on RP866881	Freehold	Chum Street Pty Ltd		-
Lot 1 on RP895110	Freehold	Chum Street Pty Ltd		-
ML 4559				
Lot 2 on SP207444	Freehold	Chum Street Pty Ltd	Ipswich City Council	Lot L on SP152146 Lot C on SP207444
Lot 25 on SP220030	Freehold	Chum Street Pty Ltd		Lot M on SP152146 Lot A on RP138484 Lot C on SP207445 Lot D on SP207445
Lot 27 on SP220033	Freehold	Chum Street Pty Ltd		Lot A on RP138484

Lot on Plan	Tenure Type	Landholder	Local Government Area	Underlying Land Parcels
ML 4714				
Lot 274 on SP207442	Freehold	Transpacific Waste Management Pty Ltd	Ipswich City Council	-
ML 50077				
Lot 89 on RP90564	Reserve	Ipswich City Council	Ipswich City Council	Lot C on SP247995

2.4 ML Layout

This section briefly describes the current layout and existing disturbance within each of the MLs. No mining is being undertaken, with the site having been in care and maintenance for several years prior to rehabilitation works commencing in 2023.

2.4.1 ML 4553

The former paver and refractory manufacturing facility is situated within the northern section of ML 4553. The area to the south of the former manufacturing plant previously featured stockpiles of extracted clay and shale, historical spoil and overburden stockpiles, prior to rehabilitation earthworks being conducted in 2023.

A portion of ML 4553 is located to the west of the Cunningham Highway, this portion of the lease is largely composed of the spoil dump reclamation area. A powerline easement traverses this portion of the lease (refer to Figure 2), however no disturbance attributable to this use is present within ML 4553.

2.4.2 ML 4714

This lease contains an access track through the lease, providing access to small extraction areas on top of old spoil and overburden stockpiles.

2.4.3 ML 4559

ML 4559 included three small historic excavation areas and a series of access tracks throughout the lease accessing these excavation areas. Rehabilitation earthworks commenced in 2023 and are approximately 50% complete. A powerline easement traverses the eastern portion of the lease, with disturbance attributed to this use including six transmission towers and an access track between them. The access track must remain for use by the power utility for their ongoing maintenance purposes. The transmission towers are the property of the power utility.

A historic waste disposal (broken bricks and similar waste) area is situated within the powerline easement that transects the lease. Observations of the area indicated that waste has been covered over by soils, with no obvious signs of the waste disposal area.

2.4.4 ML 50077

This lease contains a small excavation area (and sediment trap) which is also used for scientific purposes. The rock units exposed in the quarry face in the reserve contains a number of fossils, mainly consisting of early Triassic age flora. The quarry disturbance is to remain unrehabilitated, in accordance with the scientific purposes outcome.

A powerline easement traverses this portion of the lease, however no disturbance attributable to this use is present within ML 50077.

2.5 Primary Mine Features/Infrastructure on Site

Road access to the site is from the Cunningham Highway, via Chum Street, with the lease areas to the west of the highway accessed by an underpass track.

There is no built infrastructure (buildings or processing plant) on the Project site relating to mining activities, with the former brickworks facility being subject to a separate Environmental Authority (EPPR00422413). This industrial area includes several sheds, a workshop an office building and hardstand/laydown yard, along with a carpark on the opposite side of Chum Street.

There are existing old (historical) spoil and overburden stockpiles, some of which have since undergone rehabilitation, being utilised as fill and placed in uniformly compacted layers in accordance with the relevant specification. Due to the nature of the mining operations, there are no existing or proposed tailings dams or heap leach pads.

There are no mine water management dams, such as process water dams, raw water dams, evaporation dams located within the Project area. There are water, power and sewage connections to the former brickworks area only.

A high voltage transmission power line runs NW to SE through the leases west of the Cunningham Highway and is serviced by an access track. The power line is subject to an easement agreement with the power utility that requires the alignment to remain clear to enable access for maintenance in accordance with requirements specified under the *Electricity Act 1994*.

2.6 Type of Mining Operation

Mining on ML 4553, ML 4559, ML 4714 and ML 50077 has been granted for the following minerals:

- Clay - Brick Clay;
- Clay – Fire Clay;
- Clay – Pottery / White Ware; and
- Shale.

While mining at the Project site has ceased, the mining method generally employed on ML 4553, ML 4559, ML 4714 and ML 50077 comprised the following steps:

- Vegetation clearing (limited as necessary);
- Topsoil and overburden stripping (as necessary);
- Clay/shale extraction (in situ) or reclamation (old spoil dumps) (dozer, excavator, front end loader or similar);
- Clay/shale stockpiling; and
- Clay/shale haulage.

Common with other clay pit operations in the area, ML 4553, ML 4559, ML 4714 AND ML 50077 was worked according to market demand. The type of clay required was based primarily on its firing characteristics and colour, and mining operations fed the brick and paver manufacturing facility located off Chum Street.

2.7 Proposed Duration of Mining Operation

Mining operations have ceased onsite and rehabilitation works commenced in 2023. Current mining lease expiry dates are provided in Table 1, and it is noted that some rehabilitation completion dates will extend beyond the current terms of the mining leases.

We have been previously advised by the Department of Environment, Science and Innovation that in preparation of PRC Plans, it can be assumed that the term of the mining lease will be extended at the appropriate time to allow for the completion of rehabilitation.

3 Rehabilitation Planning

3.1 Baseline Information

3.1.1 Climate

3.1.1.1 Current Climate

The climate of the Project is sub-tropical with warm to hot wet summers and cool dry winters. Climate data was derived from the Ipswich weather station (Station 040101) as this is the closest weather station to the site that has both rainfall and temperature data available (BOM, 2022).

Mean annual rainfall for Ipswich is 878.5mm (1870 – 1994). Rainfall occurs predominantly in the summer months, as shown in Table 3.

In south-east Queensland the annual average potential evaporation is almost 50% greater than the annual average rainfall, which contributes to the depletion of soil moisture (DES, 2019).

Table 3 Climate data for Ipswich

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean maximum temperature (°C)	32.0	31.1	29.9	27.5	24.1	21.5	21.1	22.8	25.9	28.5	30.8	31.9
Mean minimum temperature (°C)	20.0	19.7	18.3	14.7	11.0	8.2	7.0	7.6	10.7	14.2	16.9	18.8
Mean Rainfall(mm)	124.9	119.7	100.6	63.1	50.5	51.1	43.5	33.6	41.4	65.7	78.1	105.6

(BOM, 2022)

3.1.1.2 Long-term Climate Projections

The long-term climate projections are important to understand when planning for rehabilitation. These predictions are documented in the Long Paddock Queensland Future Climate Dashboard Queensland Government (2022). The mean annual temperature for the Ipswich CC is predicted to rise by approximately 1.0°C by 2030 and by approximately 4.1 °C by 2090, as shown in Figure 3.

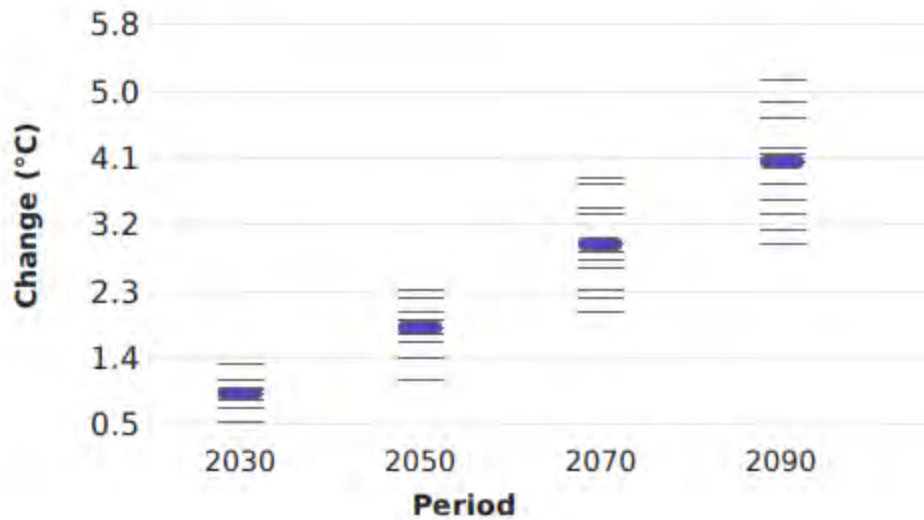


Figure 3 Mean temperature for annual season (based on 1986 to 2005 reference period)

(Queensland Government, 2022)

The maximum 1-day precipitation is predicted to remain similar as shown in Figure 4.

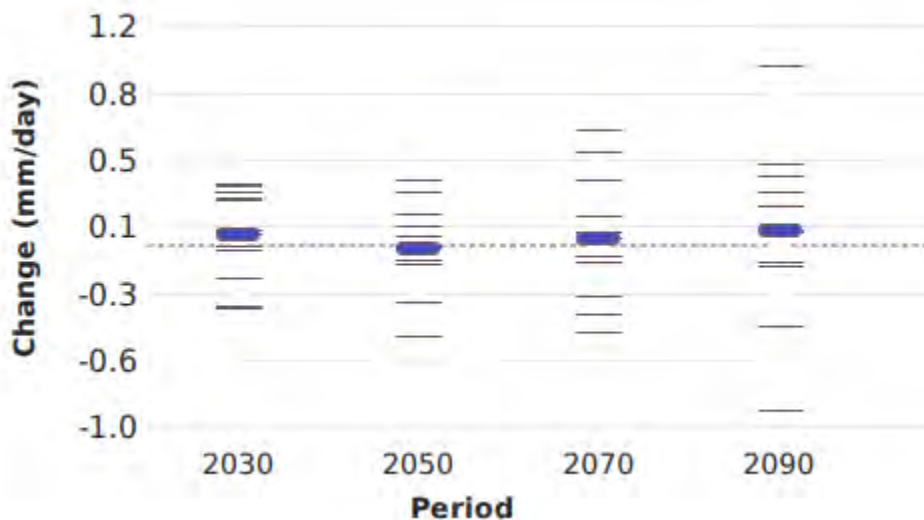


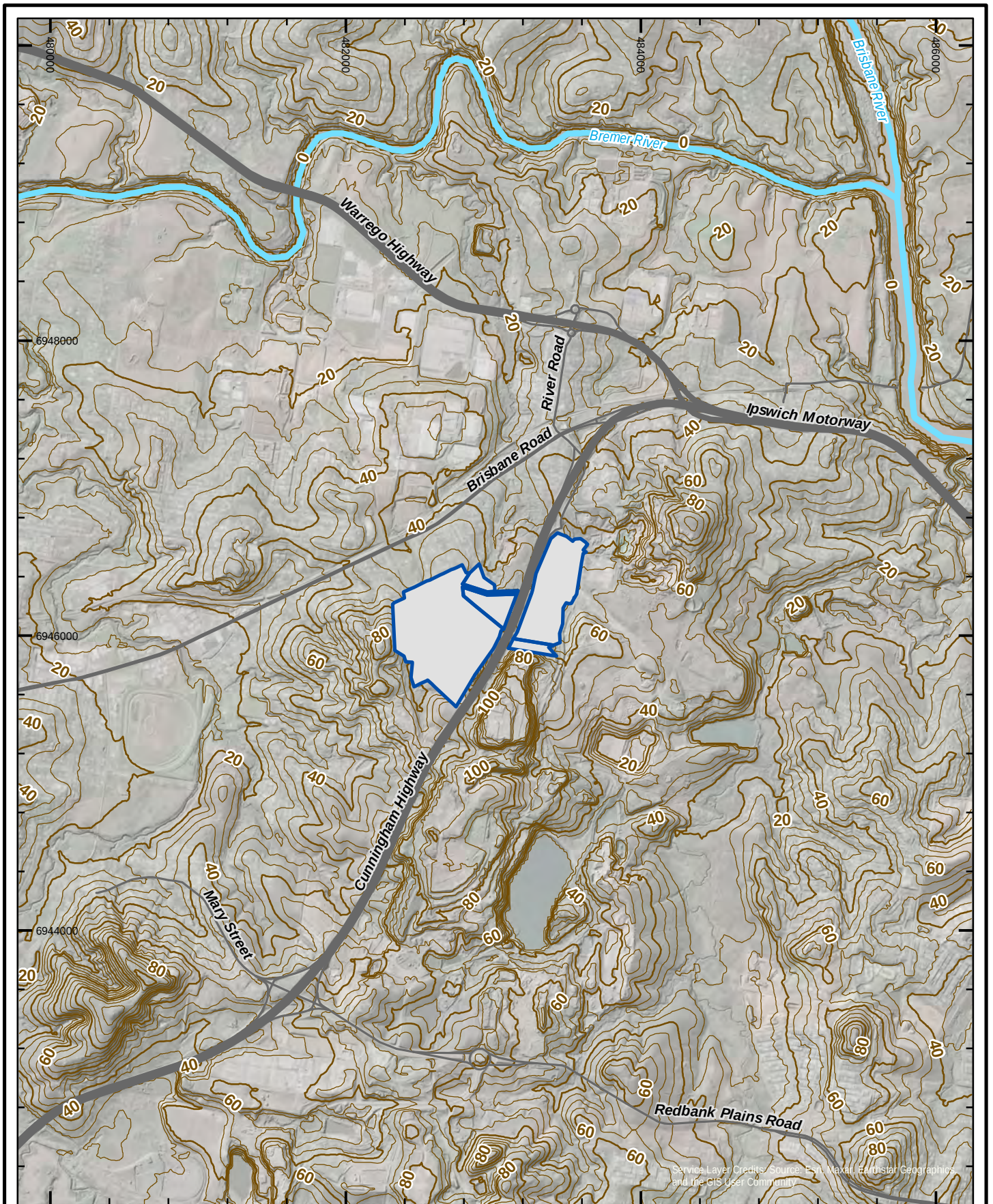
Figure 4 Maximum 1-day precipitation for annual season (based on 1986 to 2005 reference period)

(Queensland Government, 2022)

3.1.2 Topography

The eastern mining leases have been levelled for industrial use, whereas the western leases contain undulating terrain with the natural landscape heavily modified from mining operations. It now generally slopes towards the west with the eastern plateau sloping from 98 mAHD to 50 mAHD. Ground surface levels at the site slope towards a drainage channel (gully) located along the south-western border of the site, from highs of approximately 98 mAHD reported in the eastern portion of the site. The drainage

channel runs in a north-south direction through the site along the western boundary, with a low of approximately 50 mAHD (Epic, 2024). Regional topography is shown in Figure 5.



0 0.25 0.5 0.75 1
km

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New Chum

GDA2020, MGA Zone 56



Regional Topography
(Ipswich 2019)

Legend

- Mining Lease Boundary
- Highway
- Secondary Road
- Major Watercourse
- Contour

Sheet No.

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Drawn By: Chris Schlebusch

Requested by: Joanne Salmon

Date: 18/03/2024

Data sources:

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3.1.3 Geological setting

3.1.3.1 Regional Geology

Regionally, the Project is located in the Triassic to Middle Jurassic age Clarence Moreton Basin. This basin extends over approximately 10,000 km² of south eastern Queensland and northern New South Wales. In Queensland, the western boundary of the basin continues into the Surat Basin, while the other directions are bounded by older metamorphic and volcanic terrains. The Clarence Moreton Basin is mainly a fluvial - environment basin, with lesser coal swamp and lacustrine facies developed in some areas.

The Clarence Moreton Basin overlies the Ipswich Basin, a Middle Triassic age alluvial, fluvial and lacustrine environment basin, which includes the Ipswich Coal Measures. The Ipswich Coal Measures were the dominant coal resource targeted by historical to recent coal mining in the Ipswich coal field.

3.1.3.2 Site Geology

The local geology of the eastern part of the Project (Figure 6) indicates that the northern section of ML 4553 is underlain by Tertiary rocks, whereas the southern part is underlain by sedimentary rocks (sandstone, shale and coal) which comprise part of the Ipswich Coal Measures – Blackstone Stage, including the Bluff, Four Foot Top, Main Four Foot, Bergin's, Striped Bacon and Rob Roy Seams. Also shown is the significant New Chum Fault that extends in a north west to south west direction across the southern portion of ML 4553, whereas the significant Ebbw Vale Fault can be seen to the north of the site (Moreton Geotechnical Services, 2013).

A review of the local geology of the western part of the Project (Figure 7) concluded that the bedrock in the area of the site typically comprises sandstone, shale and coal of the younger most productive Blackstone Stage and the older less productive Cooneana Stage of the Ipswich Coal Measures. The beds of both formations have been disturbed by the Bundamba Anticline, a major structural feature, the crest of which passed to the near west of the site. The beds to the west of the crest of the anticline dip to the west due to the folding, whereas the beds to the east of the crest of the anticline (i.e. under this site) dip to the south and east due to the folding. The major folding also induced faulting in the beds with the most prominent faults in the area having east to north east to west to south west alignments. The two most prominent faults through the site area are the subparallel northern Braeside and southern Coronation Faults which are approximately 350m apart (Moreton Geotechnical Services, 2011).

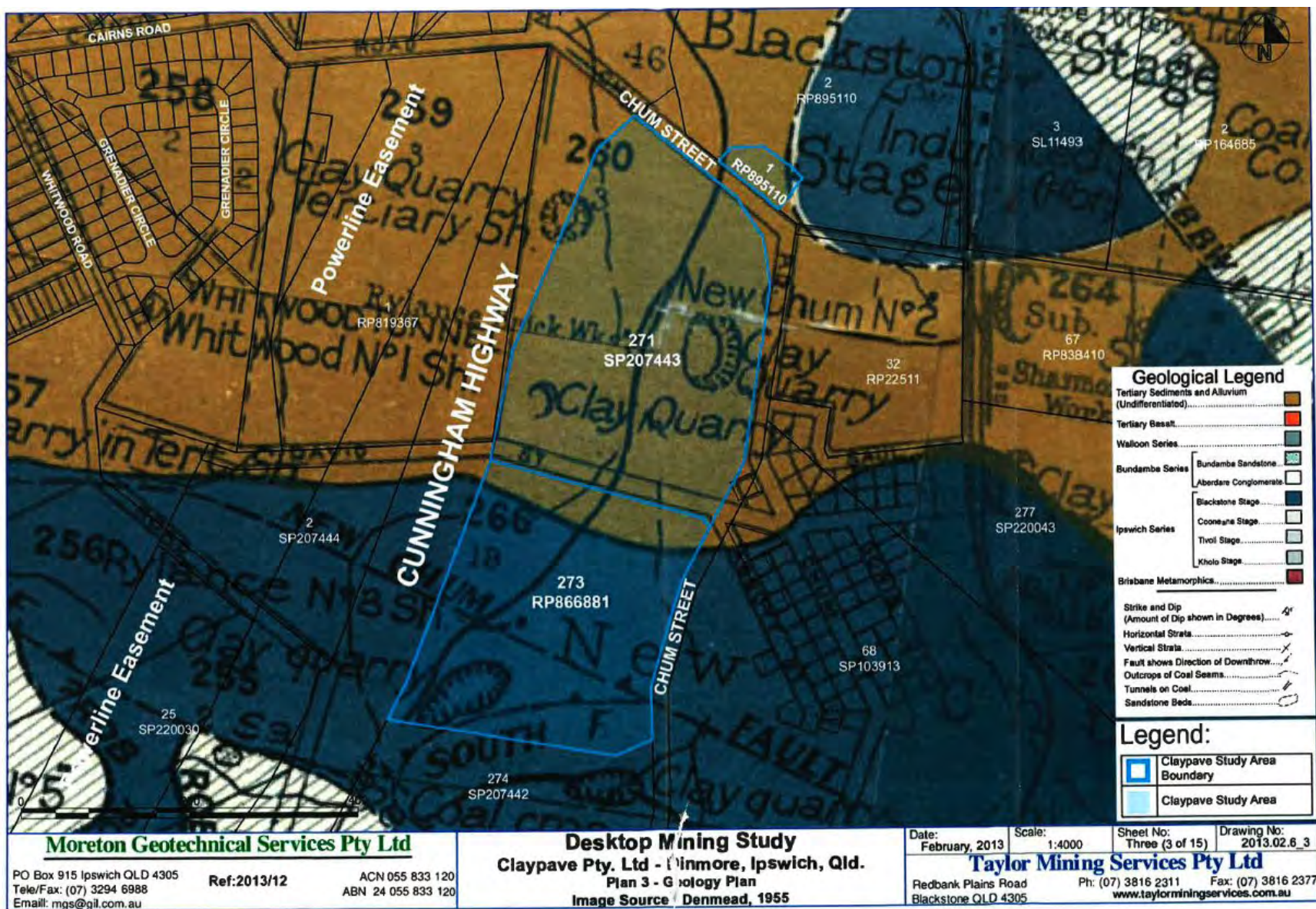


Figure 6 Site Geology Plan- Eastern Leases

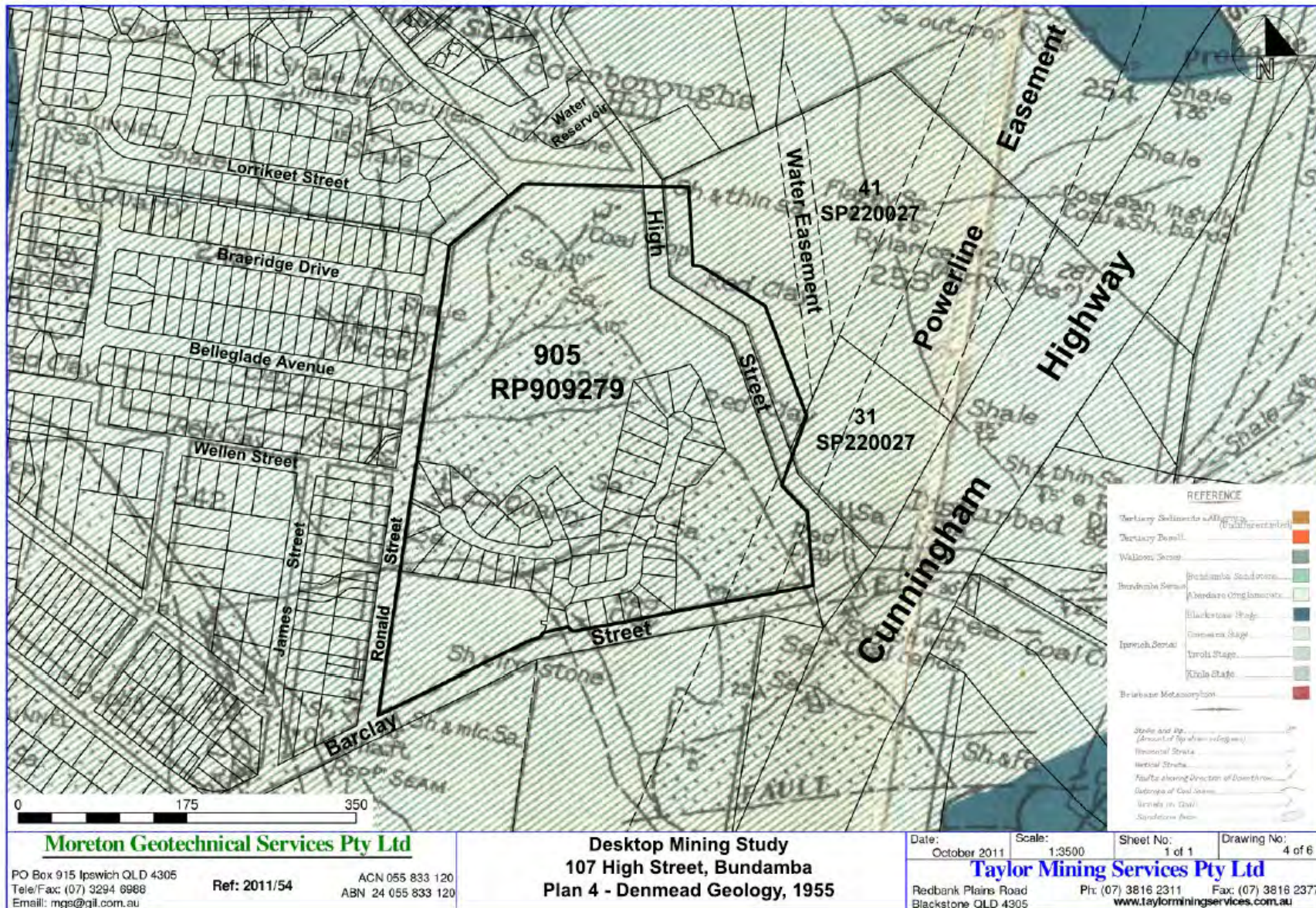


Figure 7 Site Geology Plan- Western Leases

3.1.4 Site Hydrology and Fluvial Networks

The Project site lies within the Bremer River drainage sub-basin which forms part of the Brisbane River drainage basin. Drainage onsite generally flows from the south to the north. Any release of water from the site flows into an unnamed tributary of the Bremer River which eventually flows into the Brisbane River. The environmental values and water quality objectives for the waters located in the Project region are detailed in the 'Bremer River environmental values and water quality objectives' as prescribed in Schedule 1 of the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*.

The environmental values for the Bremer River fresh waters are:

- Aquatic ecosystems;
- Irrigation;
- Stock water;
- Farm supply / use;
- Secondary recreation;
- Visual recreation;
- Industrial use; and
- Cultural and spiritual values.

There is no processing plant on site that generates a waste water, therefore there are no mine water management dams located on ML 4553, ML 4559, ML 4714 or ML 50077. All stormwater runoff from disturbed areas to the east of the Cunningham Highway flows in a northerly direction from the stockpile area (ML 4714 and southern portion of ML 4553) through to the infrastructure area located on the northern portion of ML 4553. Sediment traps and settling ponds are located at low points to collect part of the surface water runoff. From here, surface water runoff is collected in a series of drains within the infrastructure area or collected in a sediment basin and/or discharged at the northwest corner of the brick works plant.

On the western side of the Cunningham, some previously disturbed areas have undergone revegetation and as such runoff is minimal. In areas where remediation earthworks are being undertaken, stormwater management structures included in the final landform design have been constructed to direct runoff to these points. Stormwater runoff from disturbed areas is also collected in sediment traps located at low points within the site.

The sediment traps/water storages previously in place for mining activities are progressively being removed as rehabilitation earthworks are undertaken and so no regular monitoring is conducted. However, previous monitoring indicated that the water collected is generally not particularly acidic or saline and does not require treatment for reuse on site.

The sediment basin located on the former brickworks site remains and is monitored following significant rainfall. The latest round of monitoring was undertaken on 19 February 2024 and results are presented in Table 4.

Table 4 Water Quality Monitoring Results

Parameter	Units	Result
pH	pH unit	7.50
EC	µS/cm	293
Suspended Solids	mg/L	10
Turbidity	NTU	34.3
Nitrite + Nitrate as N	mg/L	0.2
Total Kjeldahl Nitrogen as N Calculated	mg/L	0.2
Total Nitrogen as N	mg/L	0.4
Total Phosphorous as P	mg/L	0.06
Aluminium as Al	mg/L	<0.01
Arsenic as As	mg/L	0.001
Cadmium as Cd	mg/L	<0.0001
Chromium as Cr	mg/L	<0.001
Copper as Cu	mg/L	0.003
Lead as Pb	mg/L	<0.001
Nickel as Ni	mg/L	<0.001
Zinc as Zn	mg/L	<0.005
Mercury as Hg	mg/L	<0.0001

3.1.5 Flooding

Ipswich City Council records indicate that the site was not subject to recent major flood events, as shown in Figure 8 - Figure 14 . Therefore, there is no flood plain defined within the mining lease area.

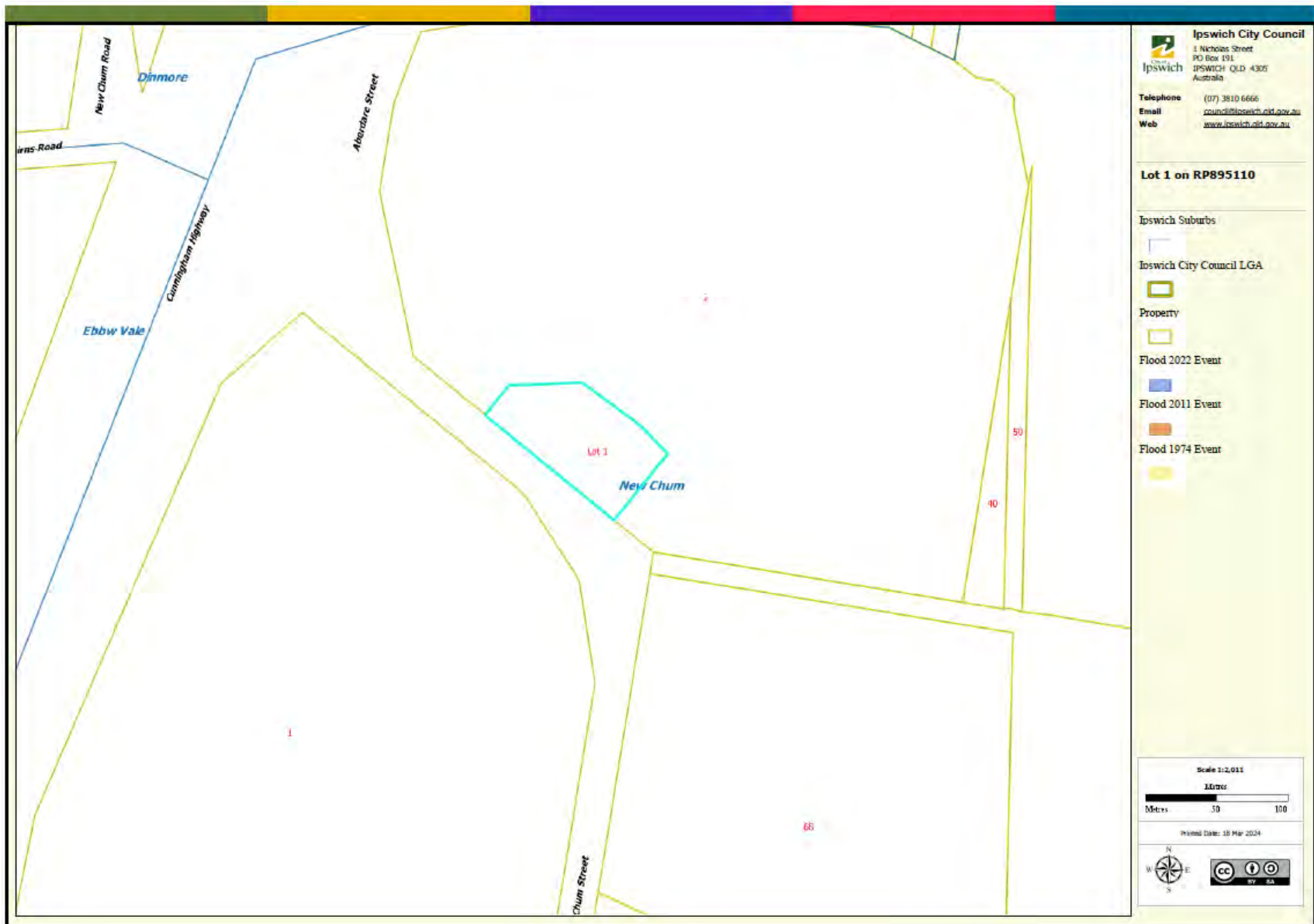


Figure 8 Major Flood Information – Lot 1 on RP895110

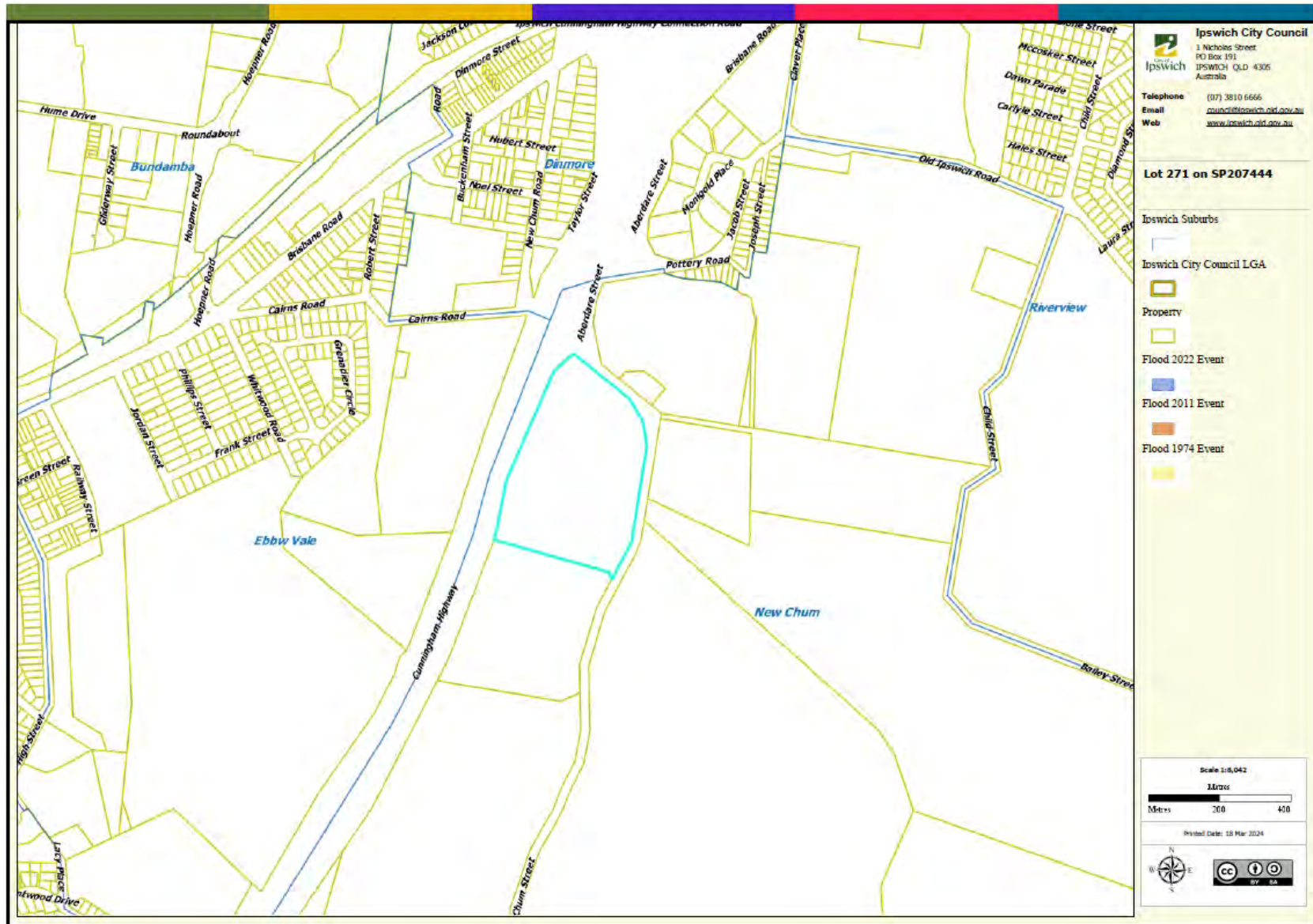


Figure 9 Major Flood Information – Lot 271 on SP207444

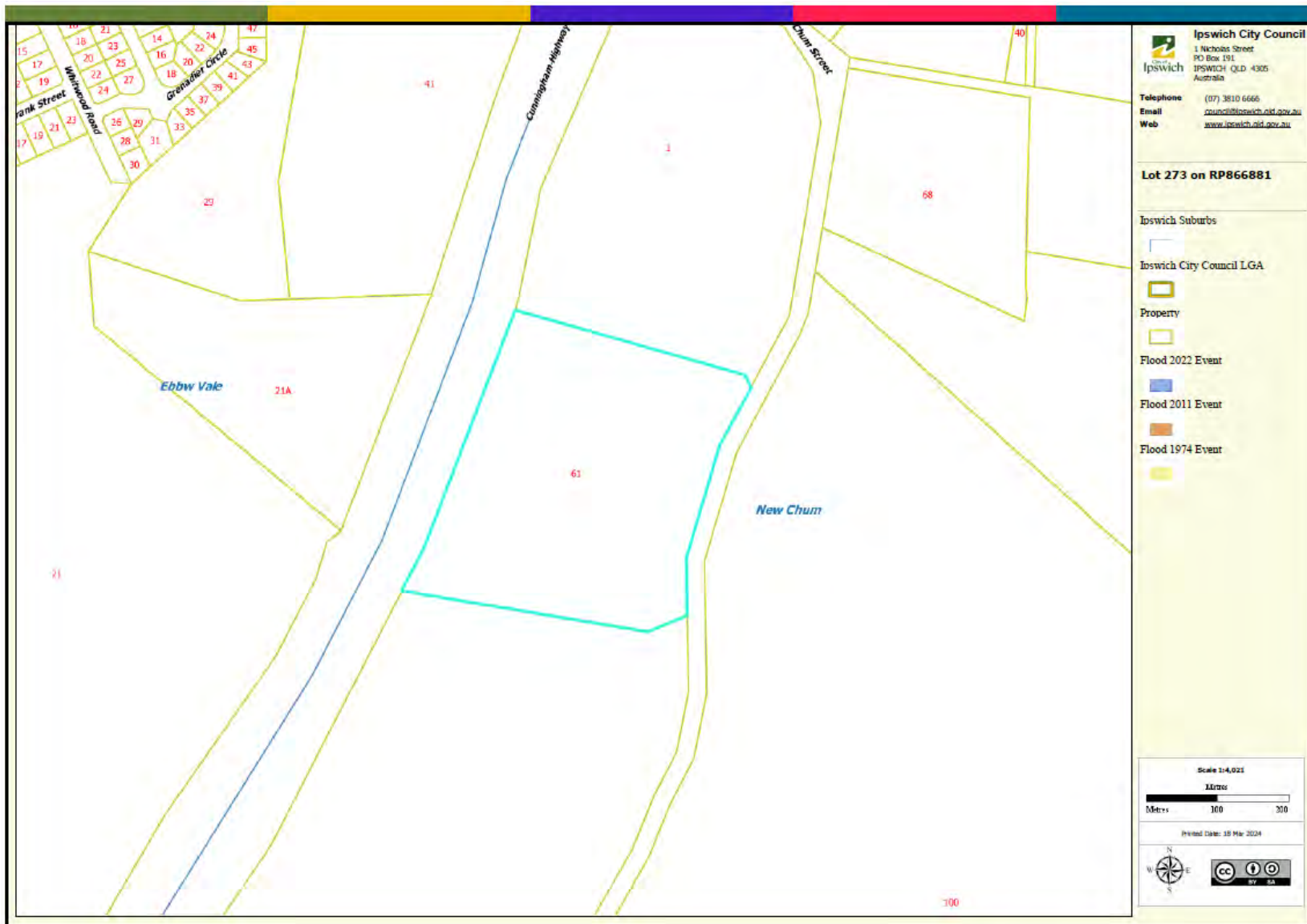


Figure 10 Major Flood Information – Lot 273 on RP866881

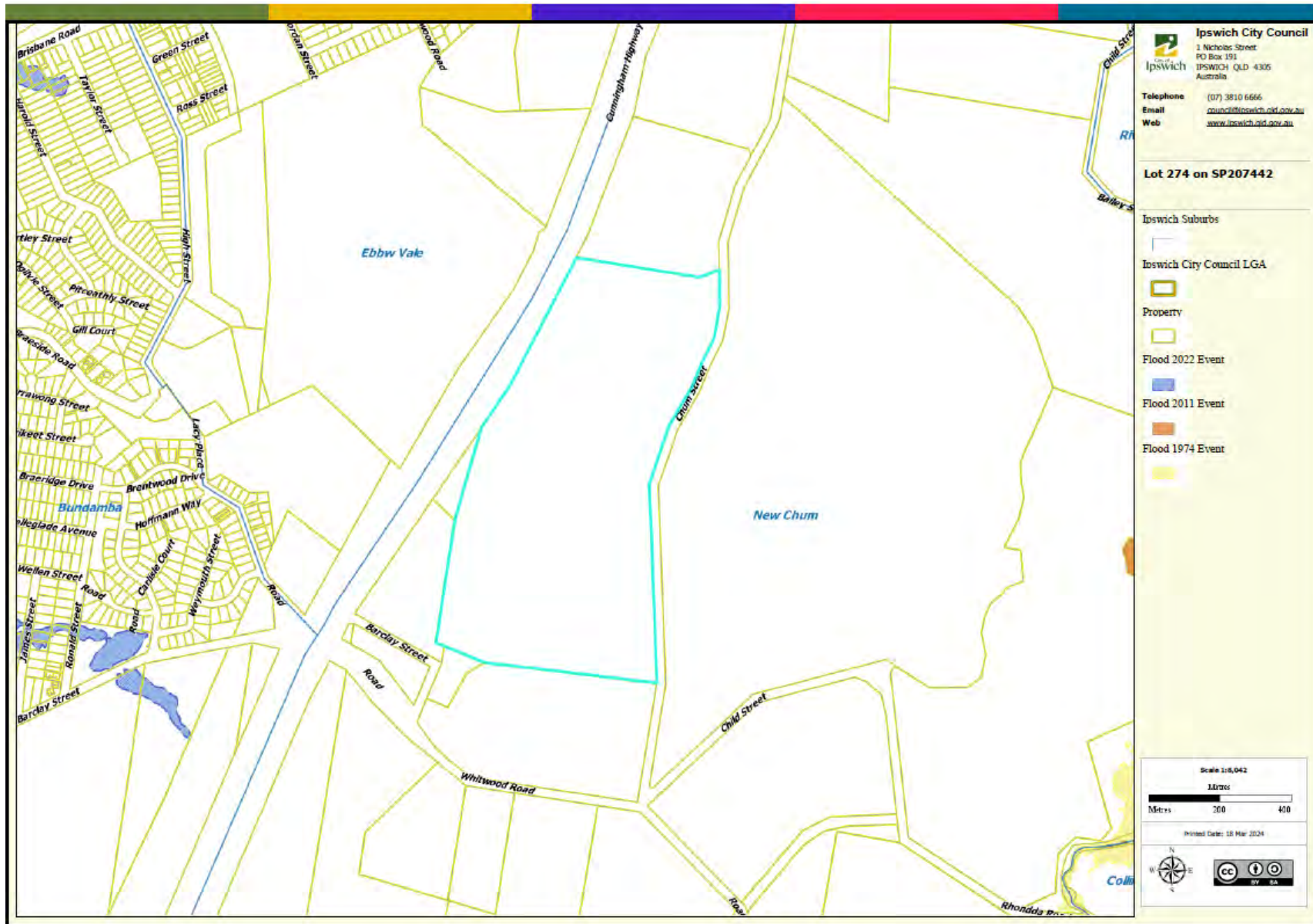


Figure 11 Major Flood Information – Lot 274 on SP207442

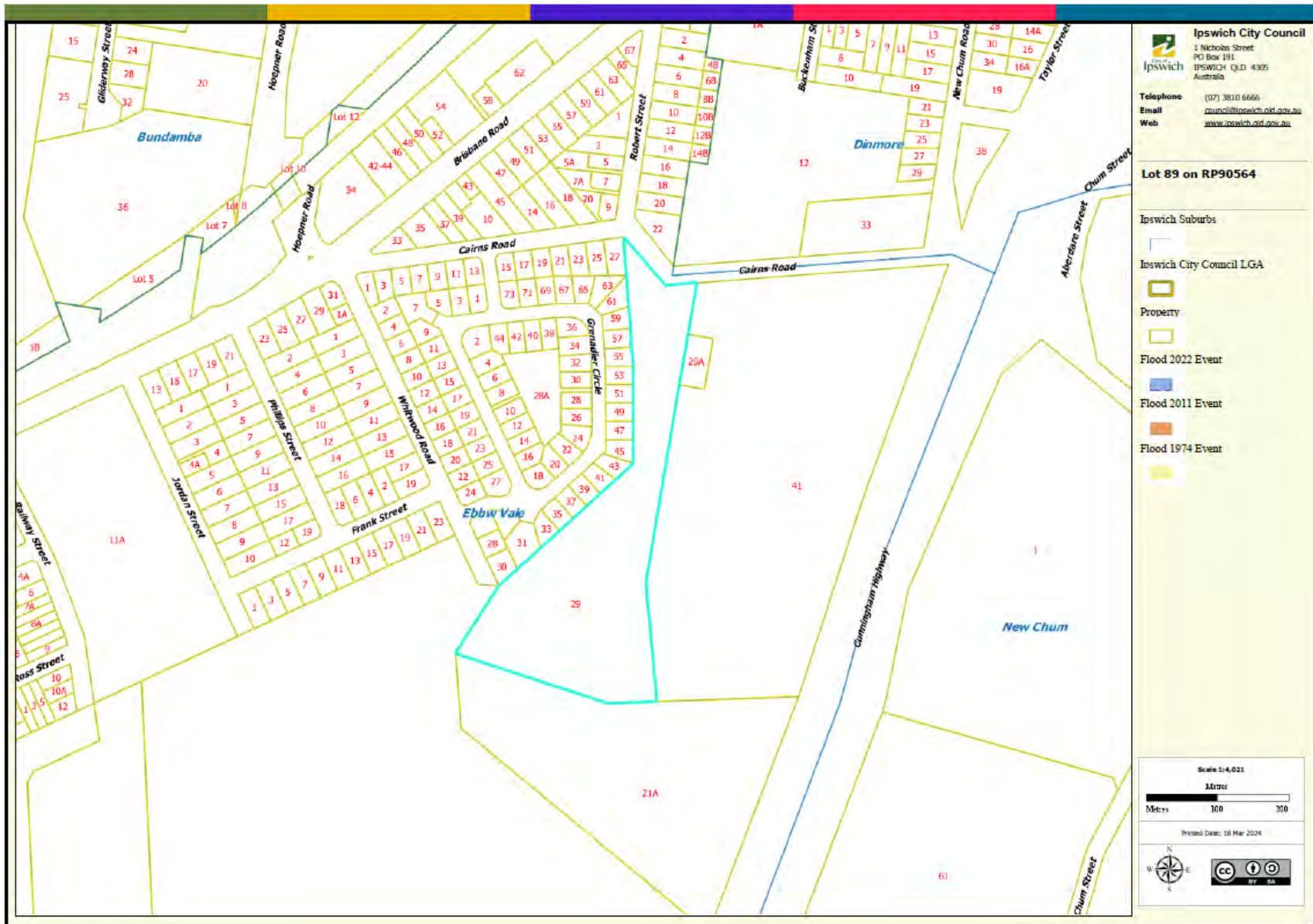


Figure 12 Major Flood Information – Lot 89 on RP90564

30

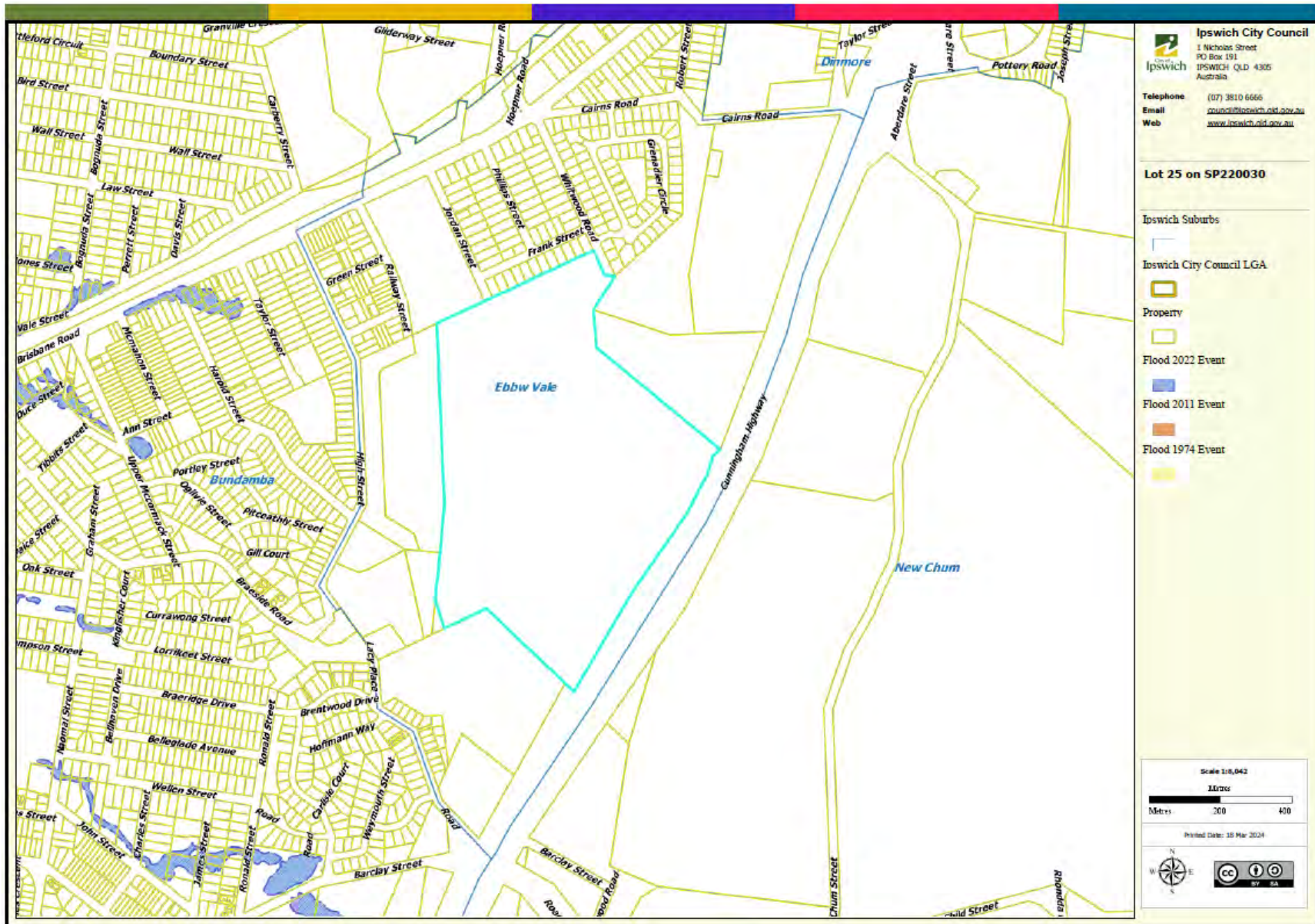


Figure 14 Major Flood Information – Lot 25 on SP220030

3.1.6 Groundwater Levels and Properties

The environmental values for groundwater are also detailed in the ‘Sandy, Six Mile, Wolston, Woogaroo and Goodna Creeks environmental values and water quality objectives.’ The groundwater environmental values for the Sandy, Six Mile, Wolston, Woogaroo and Goodna Creeks catchment waters are:

- Aquatic ecosystems;
- Irrigation;
- Farm supply/use;
- Stock water; and
- Drinking water.

Geotechnical and contaminated land investigations have been conducted for the Project, referencing groundwater conditions onsite. The results are summarised below.

With reference to the 1:2,500,000 map of Groundwater Resources of Queensland, the site is located in an area reporting very low bore yield of <5 L/s with sedimentary strata and considered marginal for human consumption and suitable for most stock and some domestic and irrigation purposes. Groundwater flow is likely to be complicated by the former mining operations, faults and topography. In general, it is expected that groundwater within the coal seams will generally flow to the north, or south in line with the dip direction of the geology (Epic, 2024).

The geology of the site can be assigned to four main hydrogeological units:

Unit 1 – Alluvium; near surface sands, clays, gravels, associated with local creeks.

Unit 2 – Raceview Formation; claystone, shale, minor sandstone, Clarence – Moreton Basin.

Unit 3 – Bundamba Sandstone; sandstone and conglomerate, clay shale, Clarence – Moreton Basin.

Unit 4 – Blackstone Stage; complex unit of sandstone, siltstone, coal seams – Ipswich Basin.

The clay-shale resource that was the target of this Project, is the Raceview Formation, part of the Clarence Moreton Basin sequence.

No groundwater monitoring bores were established onsite as part of the mining operations. A search of registered bores identified bore RN194827 located approximately 60m east of the site, which intersected groundwater at a depth of approximately 7m below ground level. The standing water level (pressure level) recorded is 24m AHD. There are no groundwater quality details available from this bore.

Groundwater bores were established as part of a contaminated land investigation completed by Epic Environmental in 2023, who also completed a previous investigation as a property immediately south of the Project site in 2021. The results from the site indicated that the groundwater at the site is anticipated to flow in a northerly direction towards the Bremer River. In general, the groundwater encountered beneath the property to the south was observed to be alkaline to neutral (pH 7.1 – 12.1) and saline (EC 8,688 – 12,248 $\mu\text{S}/\text{cm}$). Additionally, in-situ permeability testing was completed at the site with results indicating that the uppermost aquifer consisting of a coal seam and underlying shale between 10 and 17 mBGL at the site had a low hydraulic conductivity (0.19-0.41 m/day), typical of weathered rock profiles. Results for the bore installed in underground workings (approximately 32 mBGL) indicated a higher hydraulic conductivity (3.5-7.8 m/day).

There is minimal and insufficient data on groundwater quality for the site and more regionally. In October 2023, the Department of Environment and Science (DES) released a draft report “*Regional groundwater*

*chemistry zones: South East Queensland region summary and results” which forms a technical basis for the development of groundwater environmental values (EVs), water quality objectives (WQOs) and management intent mapping in the South East Queensland region pursuant to the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP Water).*

From this comprehensive assessment, there was insufficient data to determine water quality trends and groundwater quality characteristics for the ‘Ipswich coal measures’, ‘Sediments overlying coal measures’ and ‘Toowoomba Region Basalts Weathered’.

It would be anticipated that groundwater recharge occurs from incident rainfall within the surrounding area into the sandstones of the Ipswich Basin and Moreton Basin outcropping areas. In addition, some groundwater recharge may take place from the base of exhausted mine pits in the region. Groundwater discharge areas (soaks) are not locally known, unless artificially created by uncapped artesian bores. It is likely that groundwater provides some base flow to the Brisbane River, approximately 3.5km north of the site. Groundwater flow direction in shallow sedimentary aquifers is likely to follow general topography towards the northeast, from the site.

From the identified information, it can be assumed that the potential aquifer underlying the site is hosted in the underlying Blackstone Formation mudstones, sandstones and coal seams estimated to be greater than 30 mBGL, while shallower groundwater could be present in the backfilled mine voids and pits (Epic, 2024).

Remediation earthworks are proposed to occur near-surface and as such are not likely to interfere with groundwater on the subject site. Therefore, no impacts on groundwater by the proposed activity are currently predicted.

3.1.7 Soil Types, Properties and Productivity

Soils are relatively thin and sandy over arenite, deeper and more clay rich over mudstone. The soil is characterised as erosive.

In the Atlas of Australian Soils, the main soil types in the area are classified as “Tb64 - Hard pedal mottled-yellow duplex soil” and “PI1 - Hard pedal mottled-red duplex soils”, as shown in Figure 15.

The site is generally quite elevated and is therefore considered “low risk” under the Queensland Acid Sulfate Soil Technical Manual. The nearest recorded acid sulfate soil site is in grey dermosol soils located 3.5km to the north on the banks of the Brisbane River.

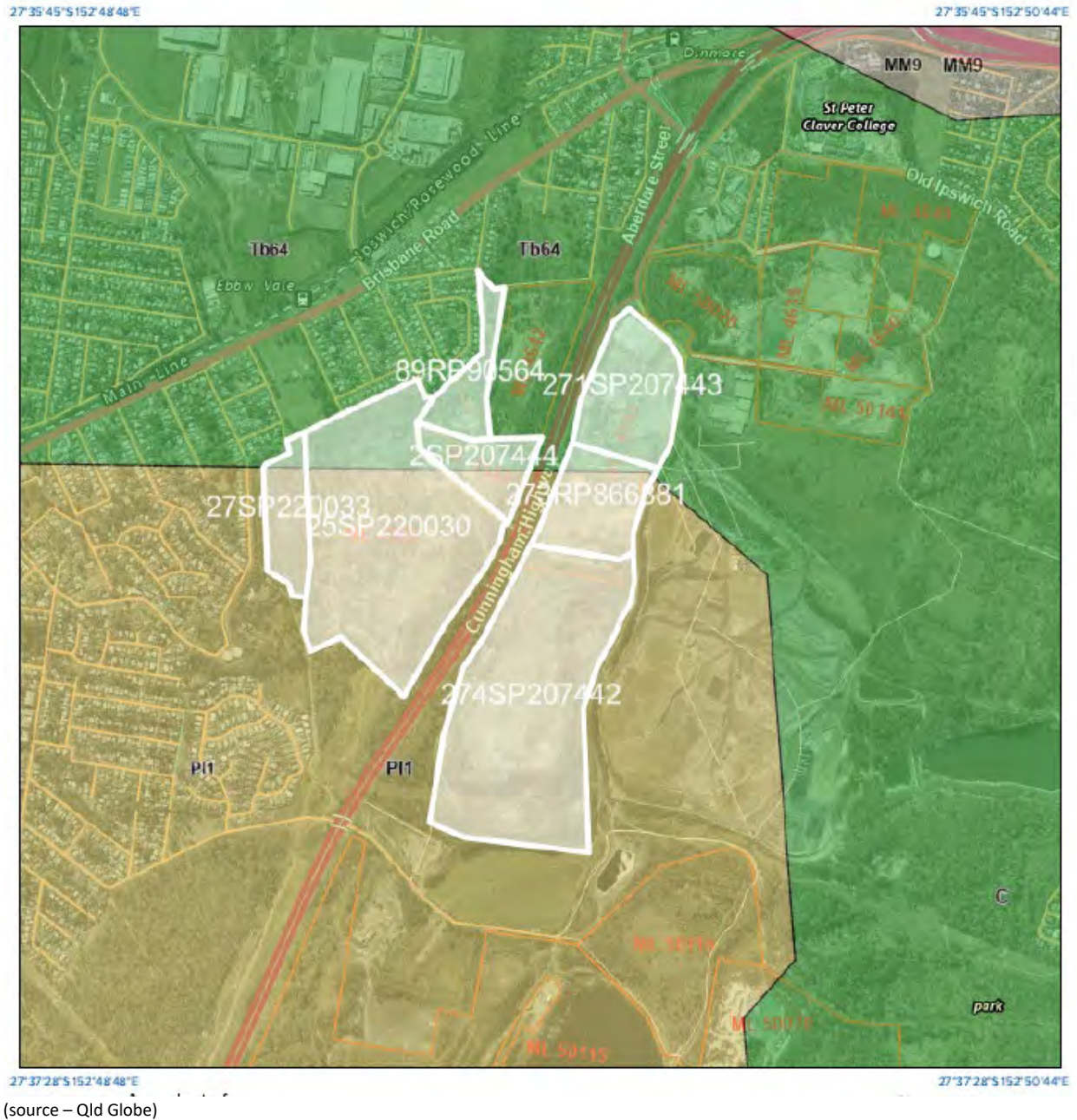


Figure 15 Site Soil Type

3.1.8 Vegetation Communities and Ecological Data

ML 4553, ML 4559, ML 4714 and ML 50077 are located within the south-east Queensland bioregion and the Moreton Region sub-basin.

Table 5 and Figure 16 detail the regional ecosystems within ML 4553, ML 4559, ML 4714 AND ML 50077 and their biodiversity status.

Table 5 Regional Ecosystems

RE	Short Description	Biodiversity Status
12.3.3	<i>Eucalyptus tereticornis</i> woodland on Quaternary alluvium	Endangered
12.3.7	<i>Eucalyptus tereticornis</i> , <i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i> +/- <i>Melaleuca</i> spp. fringing woodland	Of concern
12.9-10.19	<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i> woodland on sedimentary rocks	No concern at present
12.9-10.2	<i>Corymbia citriodora</i> subsp. <i>variegata</i> +/- <i>Eucalyptus crebra</i> open forest on sedimentary rocks	No concern at present
12.9-10.3	<i>Eucalyptus moluccana</i> open forest on sedimentary rocks	Of concern
12.9-10.7	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora</i> spp. and <i>E. melanophloia</i> woodland on sedimentary rocks	Of concern
Non-remnant	None	None

There are no Category B ESAs mapped on the Project leases. Vegetation is currently authorised to be cleared within the leases (excluding the vegetation buffer around ML50077) for mining activities.



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GDA2020, MGA Zone 56



Regional Ecosystems
(VM RE Ver 13)

Drawn By: Chris Schlebusch

Requested by: Joanne Salmon

Date: 18/03/2024

Sheet No.

RTPL_ARD_QPG003_PRCMAP_0004_A

Legend

- Mining Lease Boundary
- Property Boundary
- Easement
- Road Parcel
- Project Area

- Category A or B containing of concern
- Category A or B that is of least concern
- Category C or R containing of concern
- Category C or R that is of least concern
- Non-remnant

Data sources:

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3.1.9 Pre-mining Land Use

ML 4553, ML 4559, ML 4714 and ML 50077 is located within a setting which has been extensively modified by coal mining activities since the 1800s. Open-cut coal mining followed the original underground operations and created large voids and spoil heaps which have disturbed and modified the original landscape and drainage system.

The manufacturing facility site accommodated the old Rylance Colliery and Brickworks understood to have been established prior to the 1900s. Opencut coal mining followed the original underground operations and created large voids and spoil heaps which have disturbed and modified the original landscape and drainage system.

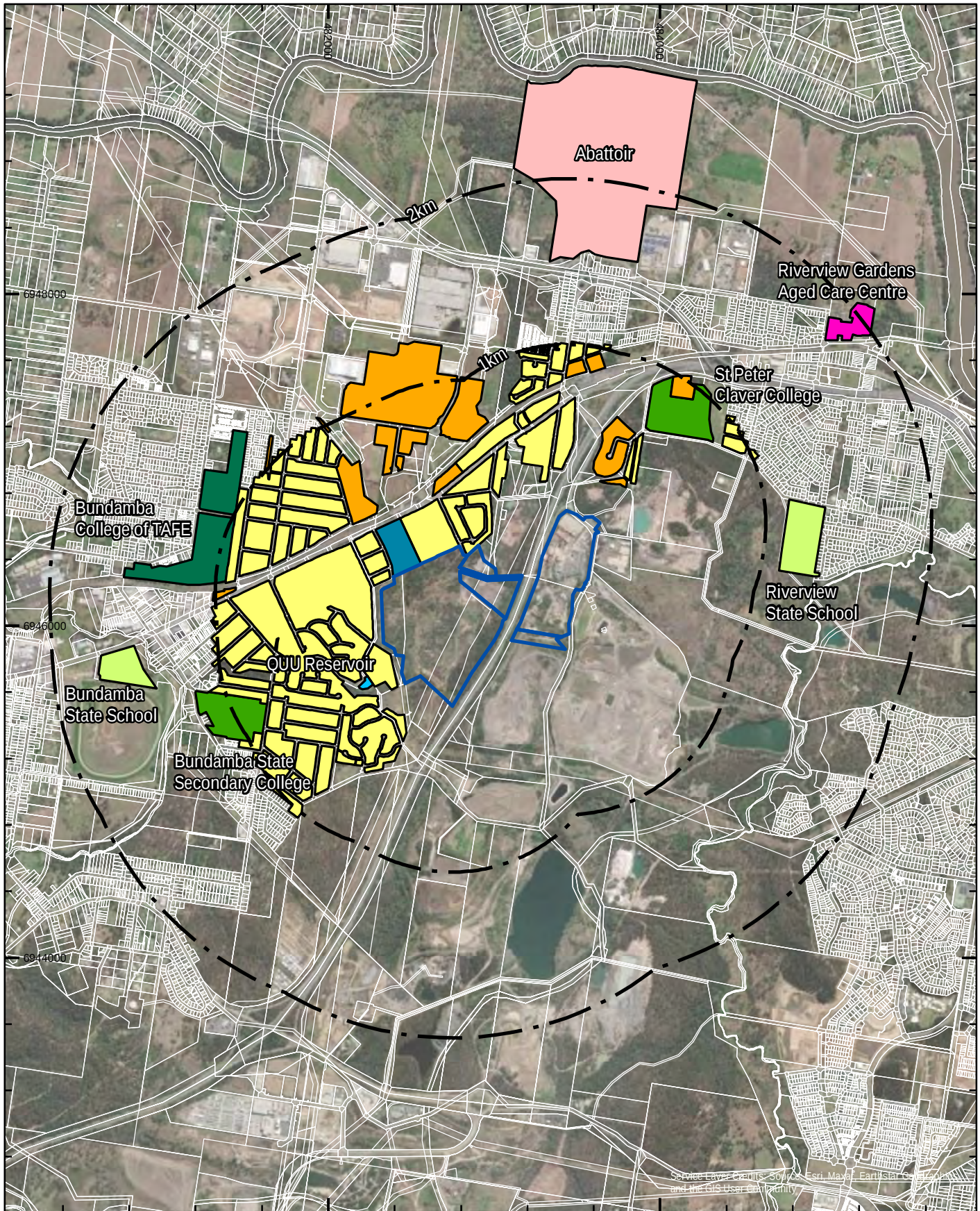
The eastern portion of the Project is surrounded by mine sites to the east and south, some of which are still active, some of which are being used for other industrial purposes such as landfill or broadscale industrial activities. The western portion of the Project is surrounded by residential properties, many of which have been present since before 1970.

3.1.10 Landholders

As noted in Section 2.3, ML 4553 and ML 4559 are located within multiple lots, all of which are freehold land owned by Chum Street Pty Ltd. ML 4714 is located entirely on lot Lot 274 on SP207442, freehold land owned by Transpacific Waste Management Pty Ltd. Finally, ML 50077 is located entirely on Lot 89 on RP90564, of which is classified as reserve land owned by the Ipswich City Council.

3.1.11 Sensitive Receptors

Sensitive receptors are located at varying distances to the north, east, south and west of the Project. Figure 17 illustrates these locations.



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GDA2020, MGA Zone 56



Sensitive Receptors

Drawn By: Chris Schlebusch
Requested by: Joanne Salmon
Date: 18/03/2024

Legend

- Mining Lease Boundary
- Property Boundary
- Commercial
- Residential
- Sports Facility
- QUU Reservoir
- Aged Care Facility
- Primary School
- Secondary School
- Technical College
- Abattoir

Sheet No.

RTPL_ARD_QPG003_PRCMAP_0003_A

Data sources:
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3.2 Design for Closure

As this is a Transitional PRCP, there is no requirement to demonstrate how aspects of the mine site have been designed for closure for existing or approved disturbance (section 3.1, PRC Plan Guideline). The rehabilitation / improvement planning includes detail from when the mining leases were transferred to Chum Street up until planned surrender, as there is little detailed information from the previous owners.

3.3 Rehabilitation / Improvement Planning

3.3.1 Progressive Rehabilitation

Consistent with Environmental Authority EPML00634213, the approved PMLU's are as per Table 6.

Table 6 Schedule F - Table 2 Final Land Use and Rehabilitation Outcome Schedule

Tenure ID	Disturbance Type	Projective Surface Area (Ha)	Rehabilitation Outcome
ML4553	Permanent infrastructure (pave manufacturing and ancillary facilities)	12.0	Industrial
	Old coal mining void and adjacent disturbed land	6.0	Industrial
	Old coal mining spoil dumps	4.0	Industrial or Residential
ML4559	Backfilled/rehabilitated old coal mining void (eastern sector of lease)	13.0	Residential
	Old coal mining spoil dumps	1.5	Residential
	Mine excavations	15.0	Residential
ML4714	Old coal mining spoil dumps and adjacent disturbed areas	1.5	Industrial or residual spoil dump
ML50077	Mine excavation and adjacent disturbed areas	1.0	Scientific purposes

In line with condition F4-1 Rehabilitation Outcome – Industrial/Residential *For the purposes of Schedule F – Table 2 (Final Land Use and Rehabilitation Outcome Criteria), areas that are to be rehabilitated to Industrial/Residential will be considered rehabilitated when the land is stabilised and does not, or will not have potential to cause environmental harm.*

In line with condition F5-1 Rehabilitation Outcome – Residual Spoil Heap *For the purposes of Schedule F – Table 2 (Final Land Use and Rehabilitation Outcome Criteria), areas disturbed land nominated for the rehabilitation outcome of residual spoil heaps will be considered rehabilitated when:*

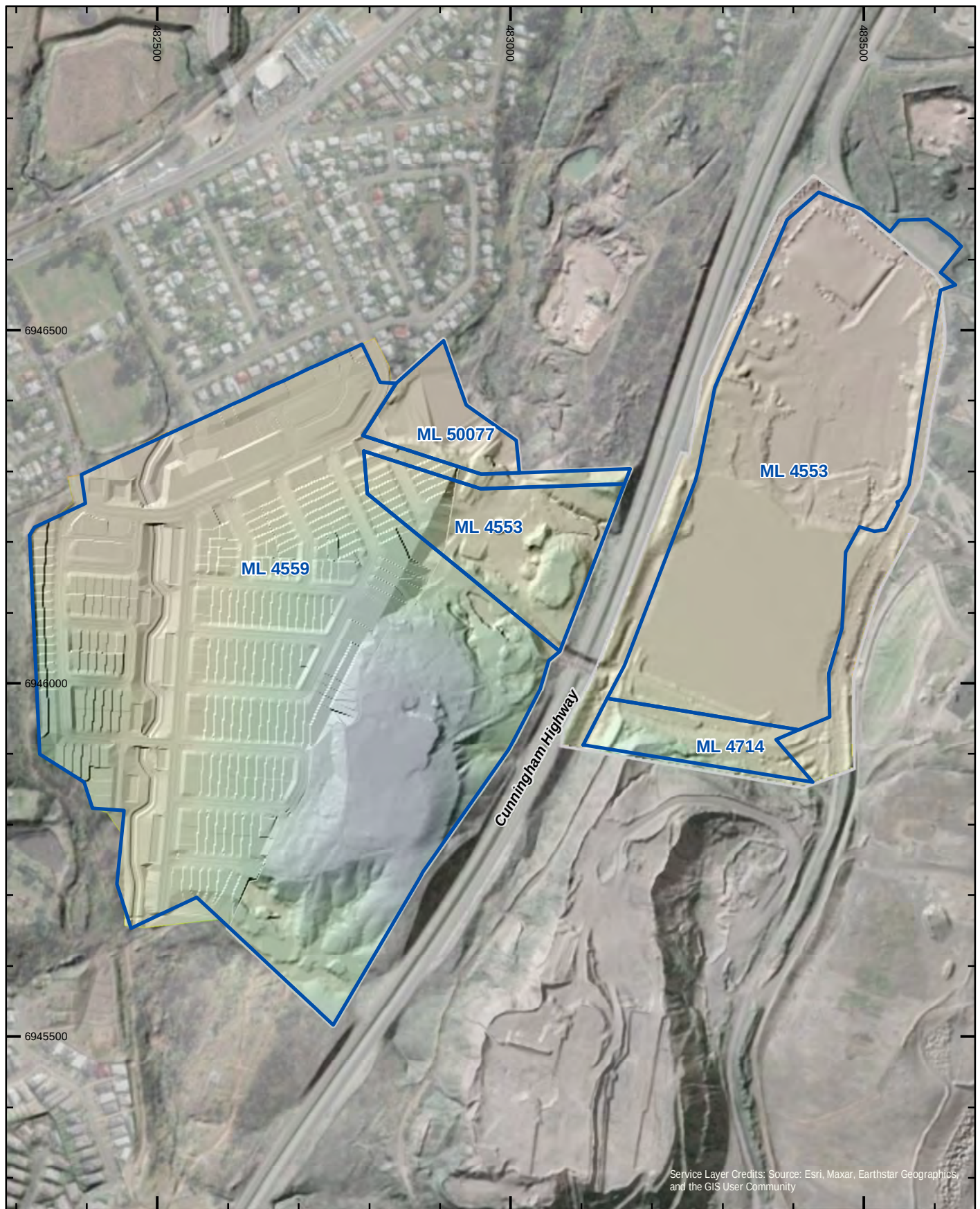
- (a) long term geo-technical stability has been achieved;*
- (b) the heaps are resistant to erosion by wind and water; and*
- (c) vegetation cover suitable to achieve a) and b) has been achieved.*

In line with condition F7-1 of Rehabilitation Outcome – Scientific Purposes *For the purposes of Schedule F – Table 2 (Final Land Use and Rehabilitation Outcome Criteria), areas that are to be rehabilitated for scientific purposes will not be considered rehabilitated until discharges of suspended solids in the stormwater released from the lease area consistently meet 50mg/L.*

As mining operations have ceased, the rehabilitation program is aimed to maximise progressive rehabilitation by scheduling the commencement and completion of rehabilitation as soon as practicable.

An area of 6.162Ha will be retained for the power corridor that traverses ML 4559 and ML 4553, to the west of the Cunningham Highway. This is necessitated by obligations under the *Electricity Act 1994*.

The final landform is shown in Figure 18.



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Post Mining Landform

Legend

Mining Lease Boundary

Sheet No.

Drawn By: Chris Schlebusch

Requested by: Joanne Salmon

Date: 18/03/2024

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Data sources:
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3.3.2 Rehabilitation Areas and Relevant Activities

For the purpose of this PRCP, Rehabilitation Areas have been defined and shown in Table 7. No mining duration is specified, as operations have ceased and rehabilitation is underway.

It is anticipated that landform development, surface preparation and revegetation will take approximately 2 years from the cessation of mining activity, as described in section 7.2.

Table 7 Rehabilitation Areas and Relevant Activities

Rehabilitation Area Name	Area Description	Relevant Activity (Former)	Size/extent of Rehabilitation Area (Ha)	Progressive Rehabilitation Possible
RA1	ML 4553 East – Southern Industrial Area	Stockpiling, sediment traps, access tracks	8.98	Yes, underway
RA2	ML 4559, portion of ML4553 West – Residential Area	Clay mining, stockpiling, access tracks, sediment traps	28.761	Yes, underway
RA3	ML 4714	Spoil dump, access track	1.98	Yes, underway
RA4	ML 50077 – Buffer Zone	Buffer zone	0.721	Yes
RA5	ML 4559, portion of ML 4553 West – Road Verge Zone	Historic waste disposal area, clay mining, sediment trap, stockpiling	0.99	Yes
RA6	Powerline Corridor	Powerline corridor, stockpiling, clay mining, access tracks, historic waste disposal area, sediment trap	5.0	Yes, underway
SCI01	ML 50077, fossil quarry	Clay mining, scientific purposes	1.225	Yes

The summary map of the rehabilitation areas is included as Figure 19.

3.3.3 Rehabilitation Undertaken to Date

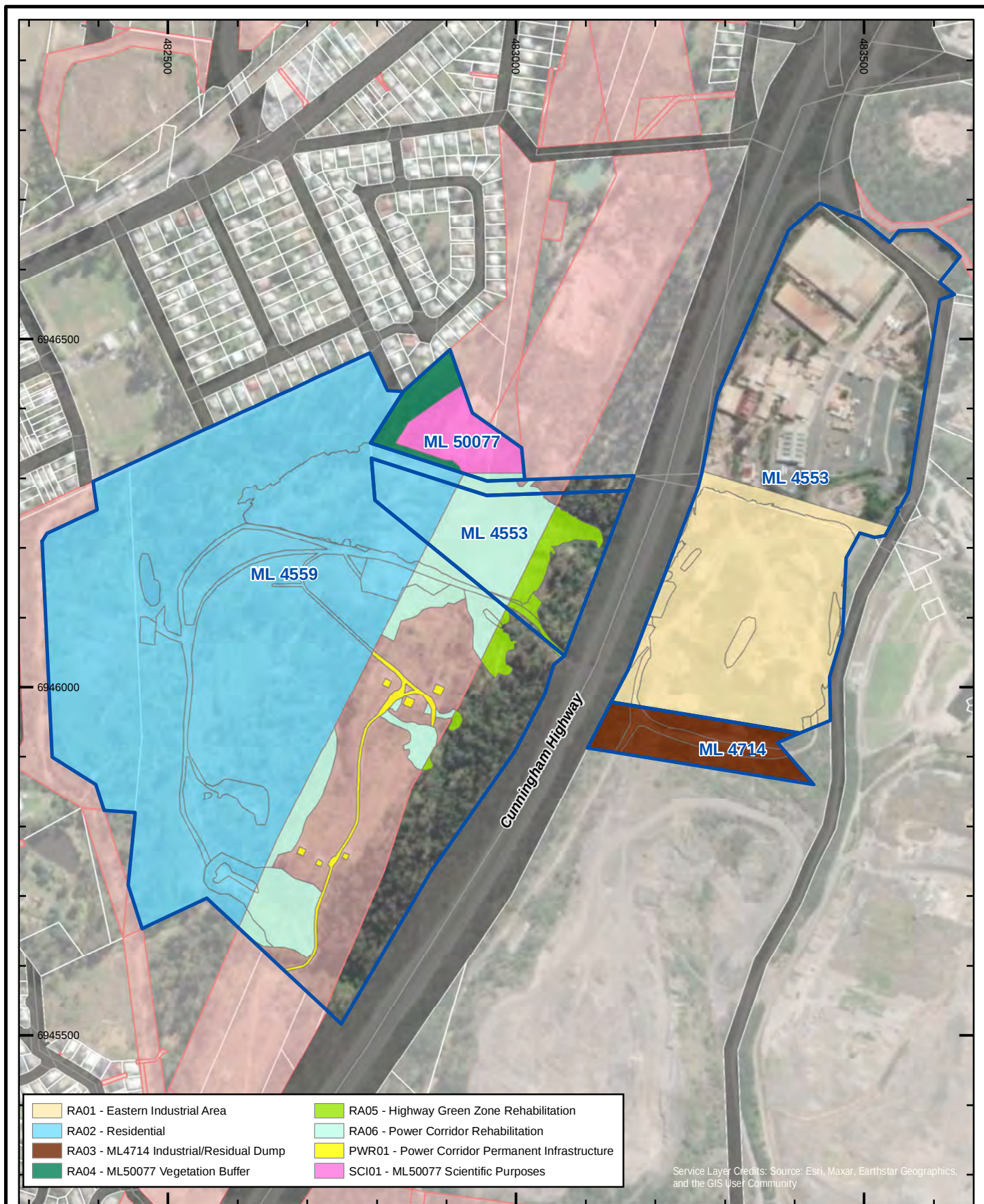
As required under section 126C(1)(j) of the EP Act, transitional PRCP's must include detail relating to the existing rehabilitation already completed.

No rehabilitation undertaken to date on site has been applied for or approved as progressively certified under the EP Act.

The history of the site is that it has been utilised for mining, stockpiling and re-mining over decades. There are few if any reliable records to help determine the history of many of the landforms. At the time of purchase of the site by Chum Street in 2020, there were some backfilled voids, and numerous clay/overburden stockpiles. Extensive geotechnical investigations have been undertaken to determine

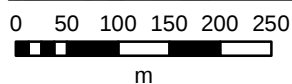
required remediation to achieve the approved post-mining land uses, and a contaminated land investigation was completed for Lot 25 on SP220030 (within ML 4559) as this was previously listed on the Environmental Management Register for historical activities.

Rehabilitation works are underway within the areas nominated for industrial and residential land uses, with substantial earthworks having been undertaken during 2023. Significant progress has been made, however heavy rainfall events in the latter part of 2023 and early 2024 has prolonged the expected duration of the program.



- | | |
|--|---|
| RA01 - Eastern Industrial Area | RA05 - Highway Green Zone Rehabilitation |
| RA02 - Residential | RA06 - Power Corridor Rehabilitation |
| RA03 - ML4714 Industrial/Residual Dump | PWR01 - Power Corridor Permanent Infrastructure |
| RA04 - ML50077 Vegetation Buffer | SCI01 - ML50077 Scientific Purposes |

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



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GDA2020, MGA Zone 56



Rehabilitation Areas

Drawn By: Chris Schlebusch
Requested by: Joanne Salmon
Date: 18/03/2024

Legend

- Mining Lease Boundary
- Property Boundary
- Easement
- Road Parcel

Sheet No.

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4 Community Consultation

4.1 Details of Consultation in Developing PRCP

4.1.1 Stakeholder Identification

The Project has a long history, with ML 4553 having been granted in 1950, ML 4559 granted in 1974, ML 4714 in 1989 and ML 50077 in 1994. It is understood that the site has been operational since that time, with the exception of a period of care and maintenance when the previous holders were in administration. A transfer of ownership most recently took place in 2020. Records relating to community consultation in relation to the mining activities and associated rehabilitation requirements prior to this are not available.

An application has been lodged for an MCU relating to the future residential land use and it is anticipated that extensive community consultation will be required during this process.

4.1.2 Community Consultation Register

In order to comply with section 126C(1)(c)(iii) of the EP Act, the rehabilitation planning part of this PRCP must include a community consultation register identifying the consultation undertaken in relation to developing the PRCP. This must include:

- Consultation date(s)
- Identification of each community member
- Description of consultation type
- Information provided to the community
- Issues raised and discussed by the community
- How issues have been considered
- Decisions/outcomes of the engagement
- Commitments made.

The Community Consultation Register is shown in Table 8 below.

Table 8 Community Consultation Register

Date	Community Member / Stakeholder	Type	Information Provided	Issues Raised	How issues were considered	Decisions / Outcomes	Commitments
Ongoing	Directly and indirectly affected landholders (neighbors)	Conversations	Discussions on mining rehabilitation progress and development of future residential land use. Identification of concerns	Dust, noise and clearing impacts	Additional monitoring is being undertaken, including depositional dust compliance monitoring as directed by DESI Compliance Ipswich	Continue engagement with landholders, as required Continue dust mitigation measures during earthworks. Continue depositional dust monitoring and reporting	Continue engagement with landholders and regulator, as required
2023	Regulatory Body	Meeting with SARA to discuss MCU for future residential land use	Prelodgement meeting to discuss potential issues with proposed use, matters to be addressed	Earthworks plans, vegetation clearing	By discussion, advice letter	Matters to be addressed in application	Submit required information with MCU application
2023	Regulatory Body	Meeting with ICC to discuss MCU for future residential land use	Prelodgement meeting to discuss potential issues with proposed use, matters to be addressed	Mining rehabilitation and suitability for proposed use	By discussion	Geotechnical investigation of interest	Submit required information with MCU application
2023	Regulatory Body	Meeting with DESI related to rehabilitation and surrender requirements, ERC transition	Review conditions relating to rehabilitation outcomes in EPML00634213.	Pathway to achieve rehabilitation outcomes and EA/ML surrender	Reviewed legislative framework to decide on actions required	PRCP to document PMLU as conditioned in the EA	Submit PRCP by 18 March 2024

2023	Regulatory Body	ERC meetings, discussions and applications	Legislated annual reporting requirements ERC calculations and financial assurance requirements	Discussed ERC calculations and transition from financial assurance framework	By discussion	ERC calculations	Chum Street to transition to new ERC framework.
2022	Regulatory Body	Meeting with DESI related to rehabilitation and surrender requirements	Review conditions relating to rehabilitation outcomes in EPML00634213.	Pathway to achieve rehabilitation outcomes and EA/ML surrender	Reviewed legislative framework to decide on actions required	Documentation required to establish rehabilitation outcomes	Commence rehabilitation works as soon as practical Submit partial surrender applications progressively.

4.2 Rehabilitation Community Consultation Plan

In order to comply with section 126C(1)(c)(iv) of the EP Act, the rehabilitation planning part of this PRCP must include a community consultation plan detailing how ongoing consultation will be carried out in relation to the rehabilitation to be carried out under the PRCP.

The objectives for community consultation, method of community engagement, frequency, information to be released and consideration of feedback and comments are included, as required, and documented in the Community Consultation Plan.

Information will include the final landform design implementation and rate, primarily with the key government stakeholders. Progress toward milestone criteria will be shared. Any issues arising will be managed through a process of regular communication; feedback and follow-up on issues raised; and close out of issues raised with the stakeholder. As the Project progresses with the rehabilitation activities for the site, a series of engagement phases will be initiated with the primary stakeholders for the project, as required.

As described in section 2.3, Chum Street is the owner of the majority of land to which this PRCP applies, with Transpacific Waste Management owning the land parcel underlying ML 4714 and Ipswich City Council holding the reserve land parcel relating to ML 50077.

Table 9 outlines the consultation program for this PRCP.

Table 9 Community Consultation Plan for PRCP

Objective	Engagement Type	Proposed consultation frequency	Released information
Inform primary stakeholders	Letter to present information on the project and timeframes for activities	On an as required basis	Dependent on contact, but may involve maps and relevant specialist information
Maintain contact with key state government stakeholders (DESI and Department of Resources) to maintain understanding of project developments	Regulatory authority information	Annual	Phone call to delegates on project status
Inform wider community of changes to Post Mining Land Use or schedule	Media release News on website	In the event of significant milestones or change to post mine land use that may have interest to the local region.	Maps and summary information relevant to the community
Fulfil reporting obligations under PRCP	Statutory reporting	Annual	Compile and present annual report to DESI

Objective	Engagement Type	Proposed consultation frequency	Released information
Ensure Local Government is informed of any proposed changes to Post Mining Land Use or schedule	Phone call and meeting with relevant Planning Department	As required basis	Phone and discussions at meetings, maps
Ensure Local Councillor and State Member of Parliament is informed of any changes proposed to Post Mining Land Use or schedule	Phone call and follow up meeting with relevant Councillor / MP	As required basis	Phone and discussions at meetings, maps

Feedback and comments received from the Community Consultation will be considered in the following way;

1. Feedback will be summarised and key themes identified.
2. Feedback will be reviewed by management and key site personnel.
3. Assessment on how the feedback can be used to improve the relevant outcomes or site management, considering the relevant business needs, approval conditions and legislative requirements.
4. Decision by management on the implementation
5. Response provided to the stakeholder, using appropriate communication channels.

5 Post-Mining Land Use

5.1 Overview

The Post Mining Land Uses for the Project are outlined in Table 10 the table below, and illustrated in Figure 20. Note this includes non-rehabilitation areas, including those areas within the Project that have remained undisturbed or have an existing permanent use.

Table 10 Post Mining Land Uses

Post Mining Land Use	Area (Ha)	Comment
Permanent Infrastructure	0.399	Powerline Access Track and Transmission Towers
Permanent Infrastructure	5.0	Power Corridor
Permanent Infrastructure	6.162	Non-Mining, Power Corridor
Industrial	8.98	ML 4553 East – Southern Industrial Area
Industrial	11.043	Non-mining, ML 4553 East - Northern Industrial Area
Other – Industrial/residual spoil dump	1.98	ML 4714
Other - Residential	28.761	ML 4559, portion of ML 4553 West
Native Ecosystem	0.721	ML 50077 – Buffer Zone
Native Ecosystem	0.99	ML 4559, portion of ML 4553 West – Road Verge Zone
Native Ecosystem	5.978	ML 4559, portion of ML 4553 West – Road Verge Zone
Total	21.5218	Non-mining, undisturbed. Highway Green Corridor

The entire area of the Project is proposed in the final site design as planned for surrender.

5.2 Consistency of PMLU and Community Outcomes

The land outcomes identified in EPML00634213 for the Project area include Industrial, Residential, Scientific Purposes and Residual Spoil Dump. To address obligations under the *Electricity Act 1994*, an area will have a PMLU of Retained Infrastructure to ensure the maintenance of the high voltage power line, transmission towers and power line access track. Consistent with the process outlined in the PRCP Guideline, Chum Street has transitioned the approved PMLU for the site PRCP and PRCP Schedule and is not required to complete the information requirements under section 126C(1)(j) of the EP Act.

Consultation has been undertaken with the relevant stakeholders in the preparation of this PRCP and PRCP Schedule. The approved PMLUs is consistent with the outcomes of the community consultation undertaken to date. Additional community feedback is expected during the public consultation period of the MCU for residential development.

No queries or issues have been raised relating to the PMLU of retained infrastructure for the area under the power line easement.

5.3 Consistency of PMLU and Planned Government Land Outcomes

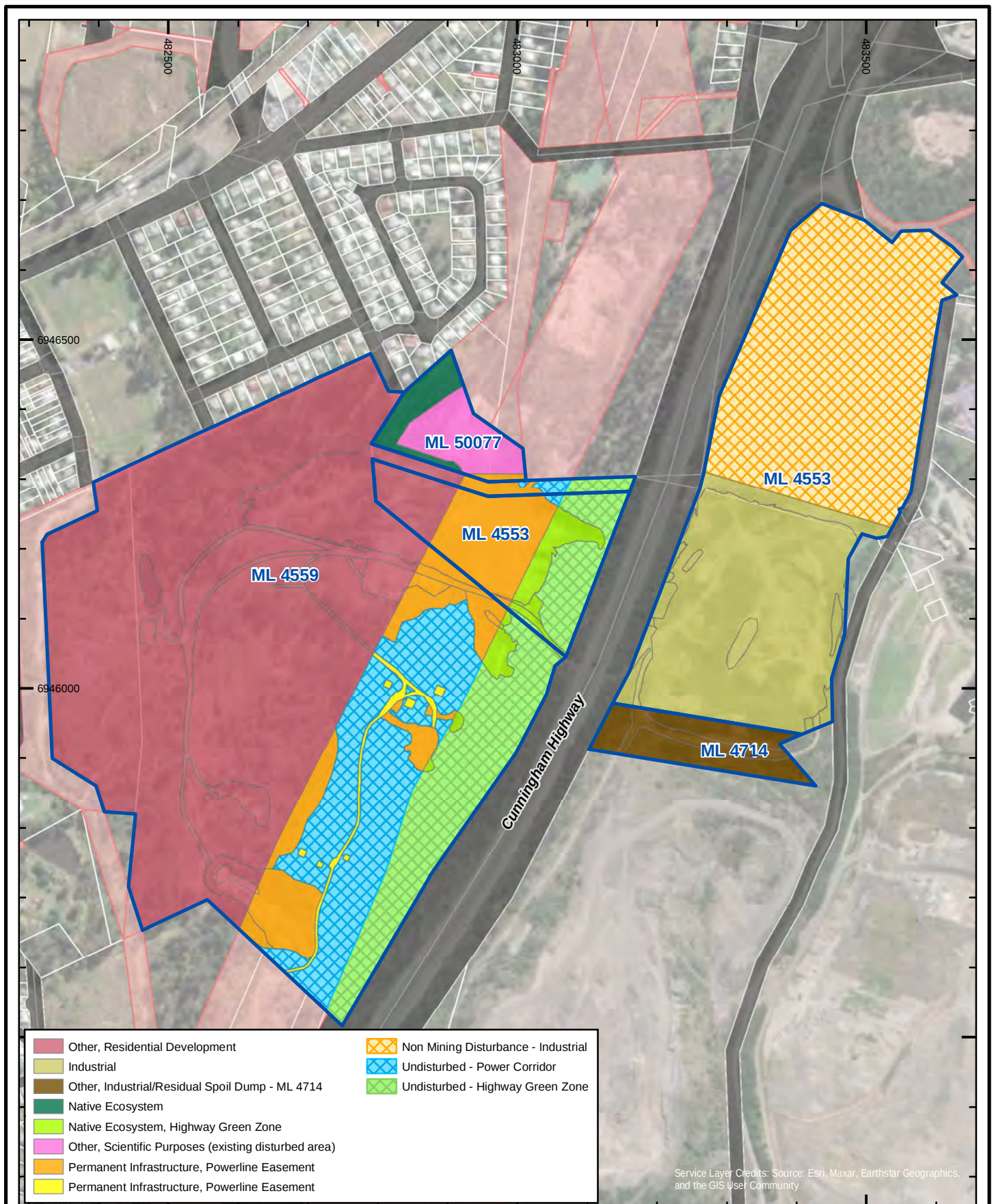
The South East Queensland Regional Plan 2017 identifies the majority of the Project area as “urban footprint” land, with the land relating to ML 50077 mapped as “regionally significant greenspace”.

The current Ipswich City Council (ICC) Planning Scheme, which was prepared after the granting of the MLs, identifies the majority of the lease areas on the eastern side of the Cunningham Highway as being within the ‘Regional Business and Industry Investigation’ zone within the ‘Regionally Significant Business Enterprise and Industry Area’ (Figure 21). Under the ICC Planning Scheme, the Regional Business and Industry Investigation zone has the overall outcome of providing regional business enterprise and industry employment opportunities subject to resolution of applicable constraints such as potential amenity impacts on nearby residential areas, mining, flooding and availability of services. The remainder of the ML on the eastern side is zoned as ‘Regional Business and Industry Buffer’, and ‘Special Uses’ as outlined in Figure 21.

The western sector of the Project is mapped as ‘Special Opportunity’ and ‘Conservation’ zones.

The PMLU’s proposed are consistent with the Local Government Town Plan, and the State Government Regional Plan.

The area within power line easement is allocated a PMLU of Retained Infrastructure. In accordance with the *Electricity Act 1994*, there is an entitlement to unrestricted access to an electricity entity’s works (s98) and it is an offence to interfere with an electricity entity’s works (s230). Therefore, there is a legal requirement to ensure that the area under the power line remains clear, hence the PMLU of Retained Infrastructure is consistent with the legislation.



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m

QUEENSLAND PROPERTY GROUP PTY LTD

New Chum



GDA2020, MGA Zone 56



Post Mining Land Use

Drawn By: Chris Schleich

Requested by: Joanne Salmon

Date: 18/03/2024

Legend

- Mining Lease Boundary
- Property Boundary
- Easement
- Road Parcel

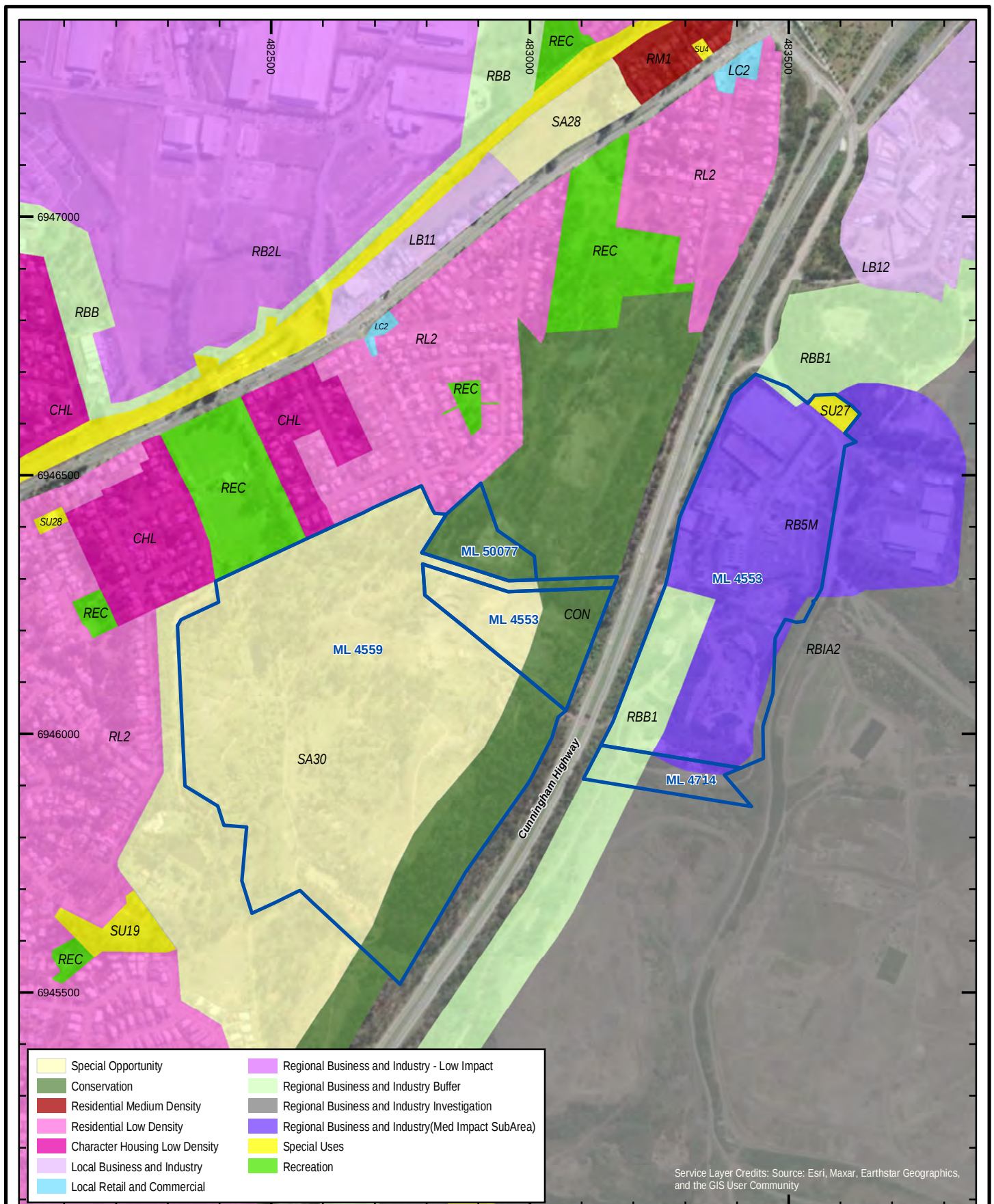
Sheet No.

RTPL_ARD_QPG003_PRCMAP_0002_A

Data sources:

©State of Queensland, Department of Resources

Path: S:\Plans\Project_Specific\Ardent\QPG003\PRCP_March2024\RTPL_ARD_QPG003_PRCMAP_0002_A New Chum Post Mining Land Use.mxd



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QUEENSLAND PROPERTY GROUP PTY LTD

New Chum

GDA2020, MGA Zone 56



Ipswich City Council Planning Scheme Zoning

Legend

 Mining Lease Boundary

Sheet No.

RTPL_ARD_QPG003_PRCMAP_0008_A

Drawn By: Chris Schlebusch

Requested by: Joanne Salmon

Date: 18/03/2024

Data sources:

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Path: S:\Plans\Project_Specific\Ardent\QPG003\PRCP_March2024\RTPL_ARD_QPG003_PRCMAP_0008_A New Chum ICC Planning Scheme Zoning.mxd

6 Non-Use Management Areas

A non-use management area (NUMA) is an area of land that cannot be rehabilitated to a stable condition after all the relevant activities for the PRCP carried out on the land have ended (§112 EP Act).

There are no non-use management areas proposed as it is planned for the entire area to be rehabilitated to a stable condition once the relevant activities carried out on the land have ended.

7 Rehabilitation Management Methodology

7.1 Rehabilitation Objectives

The EP Act requires that mine rehabilitation be conducted for land disturbed by mining activities to ensure that:

- 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 post-mining land use.

7.2 Rehabilitation Milestones and Criteria

The following milestones (Table 11) are applicable to any of the disturbance areas and are numbered in sequence of application and expected achievement. Milestones are to be:

- Outcome based
- Flexible to changing circumstances
- Include metrics
- Be reviewed
- Measurement to demonstrate achievement of milestone.

In the absence of suitable analogue sites being identified, a pre-disturbance baseline assessment of the vegetation will be undertaken to establish key metrics / milestone criteria for demonstrating achievement of the relevant milestone. This pre-disturbance baseline assessment will be completed before 1 December 2024.

Table 11 Rehabilitation Milestones and Criteria

Milestone Reference	Applicable Rehabilitation Area	Rehabilitation Milestone	Milestone Criteria
RM1 Infrastructure Removal	RA1, RA2, RA3, RA4, RA5, RA6, SCI1	No mine infrastructure equipment or materials not required for PMLU.	1. All concrete, bitumen and gravel removed, where not required 2. All non-required fencing removed 3. All machinery and equipment removed 4. All non-required surface water drainage infrastructure removed 5. All waste removed
RM2 Landform development and reshaping / reprofiling	RA1, RA2, RA3, RA4, RA5, RA6	Landform development and reshaping / reprofiling	1. Batter slopes and benches achieve final landform design 2. All major earthworks completed 3. Settlement monitoring installed 4. Sediment and erosion control structures in place
RM3 Surface Preparation	RA1, RA2, RA3, RA4, RA5, RA6	Appropriate landform surface preparation including contour ripping, topdressing,	1. Earthworks completed 2. Adequate topsoil material spread over shaped surfaces or ameliorants applied to subsoils to achieve vegetative cover

		application of ameliorants (where required).	3. An assessment of soil health and suitability has been completed by an appropriately qualified person to confirm soil is suitable for target vegetation establishment.
RM4 Revegetation (Residential/ Industrial)	RA1, RA2, RA3	Revegetation including seeding as required.	1. Seeding completed (cover crop), where alternative surface cover (subject to Council development approvals) is not to be installed.
RM5 Revegetation (Native Ecosystem)	RA4, RA5	Revegetation including seeding /planting as determined by report prepared by AQP.	1. Revegetation plan for native ecosystem PMLU areas completed, including site condition assessment of existing buffer areas/undisturbed vegetation in highway verge and selection of reference sites. 2. Completed seeding of target species per revegetation plan.
RM6 Achievement of Surface Requirements (Residential/ Industrial)	RA1, RA2, RA3	Vegetation cover determined via rehabilitation monitoring and maintenance program Erosion classification based on results of rehabilitation monitoring and maintenance program	1. Groundcover >70% where revegetation works have been conducted 2. Weed presence is at a maximum of 10 % of total vegetation cover 3. No active areas of rill or gully erosion and drainage follows appropriate drainage paths 4. No erosion classification of Severe or Extreme
RM7 Achievement of Surface Requirements (Native Ecosystem)	RA4, RA5	Vegetation cover determined via rehabilitation monitoring and maintenance program Erosion classification based on results of rehabilitation monitoring and maintenance program	1. Revegetation >40% comparable to reference site. 2. Weed presence is at a maximum of 10 % of total vegetation cover 3. No active areas of rill or gully erosion and drainage follows appropriate drainage paths 4. No erosion classification of Severe or Extreme
RM8 Achieved PMLU to stable condition (Residential/ Industrial)	RA1, RA2, RA3	Site suitability assessment Development approval for final land use as applicable	1. Certification from an appropriately qualified person that the area has achieved stable condition (including settlement monitoring where required to be installed). 2. Areas determined to be suitable for proposed use as assessed by an appropriately qualified person. 3. Development approval granted for residential and/or industrial use, as applicable
RM9 Achieved PMLU to stable condition (Native Ecosystem)	RA4, RA5	Vegetation cover and species diversity determined via rehabilitation monitoring and maintenance program	1. Certification from an appropriately qualified person that the area has achieved stable condition 2. Groundcover >60% or as otherwise specified by the revegetation plan

		Erosion classification based on results of rehabilitation monitoring and maintenance program	3. Certification of no weed and pest species abundance identified in rehabilitated areas are no greater than at reference sites. 4. No erosion classification of Severe or Extreme
RM10 Achieved PMLU (Permanent Infrastructure)	RA6	Absence of mine equipment and materials not required. Absence of contaminating materials. Erosion classification based on results of rehabilitation monitoring and maintenance program. Stable landform development. Hazard and Safety Assessment by an appropriately qualified person.	1. Final landform survey confirms no structures or equipment remain other than those documented in a landholder agreement or specified by the <i>Electricity Act 1994</i>. 2. All contaminants removed or remediated. 3. No erosion classification of Severe or Extreme. 4. Landform shows suitable slope gradients e.g. <20% except to connect with surrounding natural topography. 5. Hazard and Safety Assessment completed by an appropriately qualified person demonstrating hazards in rehabilitation areas are consistent with the nature and severity of hazards typical of neighboring equivalent land use. Identified residual hazards are low risk with no significant increase in risk expected over time. 6. Agreement with Powerlink regarding maintenance of power line easement
RM11 Achieved PMLU (Scientific Purposes)	SCI1	Absence of mine equipment and materials not required. Absence of contaminating materials. Erosion classification based on results of rehabilitation monitoring and maintenance program. Water discharge monitoring results below criteria.	1. Final landform survey confirms no structures or equipment remain other than those documented in a landholder agreement 2. All contaminants removed or remediated. 3. No erosion classification of Severe or Extreme. 4. Water discharges of suspended solids in the stormwater released from the lease area consistently meet 50mg/L. 5. Agreement with Council regarding maintenance of sediment trap.

8 General Rehabilitation Practices

8.1 Hydrogeology

Six (6) groundwater monitoring bores were installed on site as part of the contaminated land investigation on Lot 25 on SP220030 (ML 4559). The shallowest groundwater intersection occurred at a depth of approximately -10m below the top of the casing. The rehabilitation earthworks on the western portion of the Project are unlikely to interfere with groundwater as the design does not require fill to that depth to be cut and re-laid.

Rehabilitation earthworks on the eastern portion of the Project involved only near-surface works and no groundwater was intersected.

Therefore, no impacts on groundwater by the proposed rehabilitation activity are currently predicted. For this reason, no groundwater monitoring is recommended by this PRC Plan.

8.2 Flooding

Flood plain modelling is not required as there are no voids located within a flood plain being rehabilitated.

As shown in Figure 8 to Figure 14 the flood risk profile is low.

Rehabilitated areas will be re-contoured to achieve a safe and stable landform. Permanent surface water management will be incorporated into the final landform to ensure that surface waters are directed into the surrounding drainage lines.

8.3 Soil and Capping Material Assessment

The material mined was generally oxidised benign clay and clay-shale. The overburden rock is generally oxidised and benign sandstone and shales. For this reason, there are no contamination, acid or neutral mine drainage concerns and therefore a specific capping material assessment is not required.

Topsoil/subsoil will be selectively lifted and stored for later use in the rehabilitation of the Project. These materials will be located such that they are readily accessible for rehabilitation works.

Mine disturbance areas will be profiled to the final desired landform specifications to ensure that they are safe and stable, consistent with the requirements of the proposed use. Subsoil and topsoil will be replaced on the profiled landform in the reverse order to which it was stripped; that is the subsoil is placed on top of any returned overburden and the topsoil on top of the subsoil at an appropriate thickness.

Before the topsoil is spread, the profiled landform will be scarified parallel to the contour to a nominal depth of 50 to 100mm to break up any hard setting surfaces and prevent lamination of the topsoil and profiled landform. Where indicated as suitable by soil assessments, subsoils may be used as the surface layer if amelioration is undertaken to enable cover crop revegetation success. This is particularly relevant to the industrial PMLU, where subsequent works (in accordance with Council approvals) may result in the areas being covered with hardstands/bitumen/concrete.

Where required, contour banks will be progressively installed to minimise rill erosion and direct water off the profiled landform to either a stable surface or dedicated stabilised drainage paths or flumes constructed on the final landform. The heights and depths of these contour banks will be determined through ongoing landform design. At the finalisation of this process a pre-vegetation landform will have been constructed. Finalised landforms will be sown with a cover crop and grass species to provide erosion protection before the native species become established, where applicable.

8.4 Soil Management

8.4.1 Topsoil

Prior to topsoil stripping, all vegetation would be progressively cleared to the minimum extent required for the impending future works. Supervisors and earthmoving plant operators will be trained to visually identify the topsoil layers to ensure that stripping operations are conducted in accordance with stripping plans and in situ soil conditions. Care will be taken to ensure soil moisture conditions are appropriate for stripping and stockpiling.

Ideally soil will not be stockpiled but will be lifted, transported and spread on a re-contoured area in one operation, however some stockpiling will likely be required initially to open up a work front. Topsoil stockpiles will be vegetated and stabilised. T

8.4.2 Sub-soil

Material that has been stockpiled for reuse will be protected from excessive disturbance or traffic and stockpiled away from any drainage lines. Drainage will be constructed to manage or divert surface water flows around stockpiles and maintained to ensure proper functioning.

In the event that long-term stockpiles are required (present for greater than six months) they will be deep ripped and provided with a vegetative cover to maintain the soil heath, maintain biological activity and minimise erosion potential. Stockpiled material will be constructed with batters or gradients of 1:4 wherever possible. Appropriate sediment controls will be installed to prevent soil loss; and weeds and pests will be monitored and controlled as required. These stockpiles may be temporarily located within active pit areas.

8.4.3 Backfill Materials

Surplus material from the Project area west of the Cunningham Highway has been used to fill the shortfall of material present in the Project area east of the Cunningham Highway. Additional surplus material will be used to shape the landform under the powerline easement, shaping of batters and minor drainage works, eliminating any surplus.

Geotechnical investigations completed in 2023 indicated that the composition of stockpiled and fill material is variable, including composites of cohesive and non-cohesive soil over much of the site. Fill layers were encountered to varying depths and described generally as various combinations of silty clays, sands and gravels, with dispersion potential ranging from very low to very high. It was concluded that materials recovered in excavations should be suitable for re-use as fill onsite, providing that they are re-laid in layers and uniformly compacted to achieve required density ratios.

It is expected that no material will be imported on to site to complete the rehabilitation. As the soil will be used from the site, there are no concerns relating to supporting the vegetation ecosystem to support for PMLU's proposed.

8.5 Contaminated Land Remediation

No hazardous contaminant use is associated with the mining activities as no mineral processing occurs onsite. Potentially contaminating historical activities occurring within Lot 25 on SP220030 resulted in this land parcel being listed on the Environmental Management Register, however a detailed site investigation was completed by Epic Environmental in 2023, with no contamination above the relevant criteria identified. The contaminated land auditor's report recommended that the land be removed from the EMR, which was confirmed by the notice issued by DESI on 07 March 2024. The site suitability statement identifies the subject site as suitable for any use.

The most likely source of contamination during the remediation phase is minor hydrocarbon spills from plant and machinery used in the earthworks. If spills occur, they are to be cleaned up without delay and contaminated materials disposed of lawfully, as required. If potentially contaminated material is encountered during rehabilitation, works will cease in that area once made safe and an assessment be conducted by an appropriately qualified person (AQP).

Should the assessment identify sources and/or areas of contamination onsite, these are to be remediated in accordance with the AQP's recommendations and materials disposed of lawfully, as required. The site is to be validated to ensure the site is suitable for the future use as demonstrated by a site suitability statement prepared by an AQP.

8.6 Waste Characterisation

There are no waste rock dumps or leach pads on site. The overburden rock is predominantly weathered and oxidised sandstone.

There are no tailings on site as no mineral processing occurred and overburden materials are re-used in rehabilitation.

Therefore, no specific waste characterisation is required to guide the preparation of this PRCP.

8.7 Landform Design

As mining has ceased and rehabilitation works are underway, no mine design is applicable to the Project. Design for final landforms has been completed for the industrial and residential PMLUs, based on the requirements specified in the relevant geotechnical studies.

The following factors were considered when determining the appropriate design parameters for the final landforms:

- Geological factors and geotechnical stability of the materials (topsoil, sandstone, shale, clay, mudstone and gravel).
- Site specific boundaries (property and mining lease boundaries) and buffers (power line).
- Final land use.

In summary, the landform design has been created within the following design parameters:

- Road width 17m and 20m reserves with standard including provision for drainage and bunding.
- Road gradient of max 13%.
- Offset 25m from transmission towers. Rehabilitation earthworks are required beneath power lines and Powerlink requirements for line clearances have been considered.
- Nil offset from mining lease boundary except where required for ML 50077.
- Bench height 1.5m for all proposed benches.
- Batter angle for benches is 1 in 4 for all permanent batters, with 1 in 2 for temporary batters where future retaining structures will be constructed. This is a low geotechnical risk.
- Final landform batter angle is 1 in 3 which is a geotechnically stable final landform.
- Floor levels vary across the Project but are not proposed below RL25 to achieve a free draining final landform.
- Floor slope is 2% so that the pit floor is backfilled with a gentle slope towards the north to achieve a free draining final landform.

The design assumption of 1V in 4H for geotechnical stability has been selected by assessing the local landscape in the immediate vicinity of the site for natural and man-made landscapes. The region contains significant coal mining disturbances which date back over 100 years, with spoil piles providing an example of landform stability. Whilst waste dumps have been observed to the south of site with slopes up to 45%, this is considered to pose a significant risk to the longevity of the final landform.

These slopes are examples of the possibilities, however the conservative 1V:4H slope (25%) has been selected for the site which is considered to be an applicable standard for the PMLUs. Provided there are appropriate controls for the placement of fill material or controls over excavation conditions a 1 in 4 slope over 10-15m vertical distance is considered low risk to the overall landform stability.

The details of the construction method and the QA/QC that will apply will be specified by an AQP at the appropriate time, however Level 1 compaction testing of all fill placement is required in accordance with AS3798. Settlement monitoring will be installed under supervision of an AQP, and will be surveyed on a fortnightly basis initially, before moving to monthly monitoring until deemed to be acceptable by the geotechnical engineer.

8.8 Cover design

No specific cover design is required over the rehabilitated area, as the materials to be used to create the post mining landform are benign weathered oxidised sandstones and clay-shales from the overburden.

The rehabilitated areas will be covered by a topsoil cover of thickness appropriate to the revegetation required. This topsoil will be sourced from pre-stripped topsoil in advance of rehabilitation earthworks, and in the event of a shortfall, purchased from nearby suppliers. The objective of the cover system is to provide a growth media for the re-establishment of applicable vegetation over the rehabilitated areas.

Movement and handling from stockpiles to be conducted to minimise structural degradation such as compaction. The cover will be constructed by end dumping topsoil over the area to be covered, spreading by grader to the minimum thickness nominated in the revegetation plan.

The soil will be ripped if compacted, otherwise will have the surface roughened and then seeded. Contour ripping may be conducted on sloped areas to encourage soil keying, water infiltration and minimise runoff.

Mulch, jute netting or other temporary soil covers may be used in selected areas during the revegetation program to reduce the risk of heavy rain eroding the seed bed soil. In addition, slope drainage control features may be used to minimise erosion, together with catch dams to collect runoff and remove suspended solids.

Where chemical and physical tests suggest surface media has undesirable properties for plant growth, soil ameliorants may be used (e.g. gypsum, for sodicity). Fertiliser may also be used.

Logs and rocks retained for fauna habitat will be moved into rehabilitated areas at the final stage of surface preparation.

Specific QA/QC requirements will be documented at the appropriate time by an appropriately qualified person. These requirements may include (but not be limited to); testing of soils to confirm chemical and physical specification is met (where not met, the use of soil ameliorants will be incorporated), confirmation of thickness of soil cover and confirmation of slope angles.

Vegetation from clearing activities has been mulched on site and this will also be incorporated into the rehabilitation activities.

8.9 Water Management

8.9.1 Overview

The transport of sediment has the potential to impact the environmental values of both waters and land and is dependent on the scale and location of the activity, its proximity to sensitive receiving environments and the site ESC response.

Erosion and sediment transport risk exists throughout the lifecycle of mining activities, including earthworks and reducing through operational project phases to decommissioning; as disturbances are increasingly stabilised and progressively rehabilitated. Accordingly, erosion and sediment control measures differ during different phases of the project and are dependent on generally consistent seasonal patterns.

Due to the nature of operation, there is no seepage and infiltration intervention requirements. Dewatering requirements are not expected.

8.9.2 Drainage Control

There is a range of potential drainage controls that will be used in site-specific mitigation methods depending on site-specific characteristics. These potential drainage controls include the following:

- diversion of up-slope stormwater runoff around disturbed areas including stockpiles and storage areas;

- installation of lateral catch drains or flow diversion banks to minimise rill erosion along steep continuous slopes (i.e. >10%) especially associated with linear infrastructure construction (i.e. roads, tracks and power lines);
- placement of velocity control structures such as rock check dams to reduce the flow velocity in channels; and/or
- lining of channel with scour resistant materials including erosion control matting or rock lining; and use of energy dissipation structures at the outlets of banks, drains and chutes.

8.9.3 Erosion and Sediment Control

The following are a range of potential erosion and sediment controls that will be used in site-specific erosion and sediment control plans depending on site-specific characteristics. These potential erosion and sediment controls include the following:

- Prioritising drainage and erosion control measures, rather than allowing erosion to occur and trying to trap the resulting sediment;
- Spreading mulch or retained native vegetation over disturbed areas as soon as practicable after construction to reduce splash impact erosion and to stabilise disturbed landforms;
- Use of erosion blankets (i.e. jute and coir matting or geosynthetics) as an alternative to mulching in drainage channels or areas of strong winds or overland flow;
- Use of sediment traps (i.e. sheet flow and field inlet sediment traps) and sediment basins;
- Amelioration of problem soils (i.e. gypsum treatment of sodic soils);
- Use of 'ripping' or similar techniques on finished soil surfaces to encourage revegetation where required;
- Use of binding polymers; and/or
- Programming and scheduling of works to suit climatic conditions.

8.9.4 Erosion and Sediment Control Plans

Erosion and sediment control plans must be implemented and are to consider potential for environmental impacts within the documents. These should include:

- Quality and quantity of water stored in pit and sediment controls;
- Management of rainwater from cleared areas;
- Installation of permanent drainage structures including diversion drains, culverts and flow control e.g. rock checks;
- Propagation of native matting grasses and vegetation on batters and in drains, if required;
- Stabilisation of batters.

8.9.5 Rehabilitation Erosion and Sediment Controls

Achieving and maintaining groundcover is key to reducing erosion. Progressive stabilisation and rehabilitation of disturbed areas will be undertaken to reduce erosion and sediment risk. Stabilisation / rehabilitation will be undertaken to achieve the rehabilitation objectives of the approved Progressive Rehabilitation and Closure Plan.

Typical post-mine use rehabilitation strategies aimed at long term ESC include:

- Backfilling of open pit excavations;
- Reprofilling disturbed areas to be consistent with pre-mining topography;
- Reshaping disturbed areas into stable landforms;
- Permanent stabilisation of any remaining batters/roads;

- Revegetation of disturbed areas with indigenous plant species contiguous with the surrounding landscape;
- Reinstatement of stockpiled topsoil;
- Installation of permanent infrastructure e.g. rock checks, whoa boys and drainage to slow water flow rates without requiring ongoing maintenance or inspection.

8.9.6 Water Management Infrastructure

Water management infrastructure has been incorporated into the design plans for both the residential and industrial PMLU's, as prepared by an appropriately qualified person. It is intended that these structures will be constructed early in the rehabilitation works to provide suitable water storage capacity for stormwater management requirements during earthworks, to accommodate runoff from disturbed areas in the case of a storm event.

8.9.7 Water Quality Monitoring

All erosion and sediment controls will be maintained in a functioning condition until individual areas have been certified as rehabilitated. Where controls are observed to be not functioning correctly, the controls are restored to meet the required standard.

Sediment control structures, e.g. sediment basins, rock check dams, sediment fences, drainage controls etc will be inspected for capacity and structural integrity on a monthly basis and/or following rainfall events ≥ 20 mm/24 hours.

Water from sediment control structures may be tested for pH, EC and total suspended solids (TSS), assess the effectiveness of the sediment control structures. Actions shall be raised from each inspection should maintenance or repair be required, with the action assigned formally to an appropriate person in the management structure and an appropriate and realistic timeframe assigned for rectification of the erosion and sediment control measure.

Water from the sediment trap located on ML50077 will be monitored for TSS following rainfall events to establish that stormwater released from the lease area consistently meets the 50mg/L criteria nominated in Environmental Authority (EPML00634213) Condition F7-1.

Flow release from the rehabilitation works is not expected due to the capacity of the water management infrastructure proposed. As such, no regular surface water monitoring is proposed, beyond that stipulated in the EPML00634213 Condition C1-1, as follows:

(C1-1) Process water or storm water contaminated by the ERAs must be monitored at the locations and frequencies defined in Schedule C - Table 1 and monitoring of water released from point 2 must comply with the contaminant limits defined in Schedule C - Table 2.

Schedule C, Table 1 is reproduced in Table 12 below.

Table 12 Receiving water monitoring locations and frequency

Monitoring Point	Latitude	Longitude	Description	Monitoring Frequency
1 (Background)	S27°36.388'	E152°49.375'	Northern boundary of ML4559 adjoining Jordan Street, EBBW VALE	When monitoring point 2 is sampled.
2	S27°36.22'	E152°49.933'	Discharge point at north-west corner of brick works plant.	"event release"

Schedule C, Table 2 is reproduced in Table 13 below.

Table 13 Receiving water contaminant limits

Parameter	Unit	Minimum	Maximum
pH	pH. units	6.5	8.5
TSS	mg/L	-	Must not exceed 110% of the value at monitoring point 1 ¹ or if concurrent sampling is not possible must not exceed a value of 20 ² .
Conductivity	µs/cm	-	1500

¹ for the same monitoring event

² Environmental Protection (Water) Policy 2009 Bremer River environmental values and water quality objectives - Table 2a Water quality objectives to protect aquatic ecosystem environmental value.

As outlined in section 8.1 above, no groundwater monitoring has been included in this PRC Plan as the rehabilitation works are not predicted to insect groundwater aquifers.

8.10 Revegetation Method

Rehabilitation areas nominated for industrial and residential PMLU's, will be seeded with cover crop to provide temporary groundcover and erosion prevention unless otherwise authorised under a separate planning approval. Rehabilitated areas within the powerline easement, other than the designated access tracks, will also be seeded with a cover crop.

Revegetation of native ecosystem PMLU's requires further assessment by an AQP to determine appropriate seeding and/or planting rates. Suitable reference sites will be selected from undisturbed vegetation bordering the western side of the Cunningham Highway, and revegetation works will be structured towards achieving a natural condition in line with that present in the local area, rather than attempting to achieve benchmark RE's. In order to benchmark the success of the rehabilitation, a minimum of two reference sites should be established, and measurable data between the two be averaged.

8.11 Tailings Storage Facilities

There are no tailings storage facilities on site. This section is therefore not applicable to the PRC Plan.

8.12 Voids

No mining voids are present onsite, beyond those minor water storages that will be progressively removed during rehabilitation works.

8.13 Underground Mining

Underground coal mining has historically occurred however the depth to the underground mining is far beyond what will be reached during rehabilitation works. Therefore, underground mining does not need to be considered in the preparation of this PRCP.

8.14 Built Infrastructure

There is no built infrastructure (current or planned) on site for mining activities so no decommissioning is required in relation to the mining activity.

9 Risk Assessment

9.1 Risk Assessment Purpose

Section 1236C(1)(f) of the EP Act requires the PRCP to identify the risks for each PMLU of a stable condition not being achieved, and how the applicant intends to manage or minimise the risk.

The purpose of the risk assessment was to identify and assess the risks of a stable condition for the land not being achieved for the agreed PMLU of native ecosystem and any related potential for environmental harm. The purpose of the risk assessment is to also identify that action to be taken to manage and minimise any identified high risk.

The scope of the risk assessment is restricted to rehabilitation matters including the potential risks associated with the period following rehabilitation and mine closure. The scope covers risks that affect the successful achievement of PMLU type (native ecosystem).

9.2 Risk Assessment Process

The risk assessment has been conducted in accordance with the principles outlined in AS/NZS ISO 31000:2018 *Risk Management – Guidelines* (Standards Australia, 2018).

Potential hazards were identified and considered for each rehabilitation area for the Project.

A risk assessment has been undertaken in accordance with the principles outlined in ISO31000:2018 taking into account the areas of impact, events and their causes and potential consequences for the period following mine closure. An assessment of likelihood and consequence of associated risks have been made based to determine unmitigated risk. Definitions of likelihood and consequence of the risk are shown in Table 14 and Table 15.

Table 16 describes how the overall risk level is determined.

A risk assessment relating to mine closure is shown in Table 17. Proposed mitigation measures are specified. The residual risk based on effective and ongoing implementation of the mitigation measures is also included.

Table 14 Likelihood Definitions

Likelihood	Definition
Almost Certain; >90%; (5)	Greater than 90% likelihood of occurring. Has happened, will probably happen during the mine life and there is no reason to suspect it will not happen in the post-closure period.
Likely; 30% - 90%; (4)	Likelihood of occurring is equal to or more than 30% and less than 90%. This consequence is not uncommon in the mining industry/local area
Possible 10-29%; (3)	Likelihood of occurring is equal to or more than 10% and less than 30%. There is a possibility of this risk occurring as it has occurred before (albeit infrequently) in the mining industry/local area
Unlikely; 3% - 9% (2)	Likelihood of occurring is more than or equal to 3% and less than 10%. There are no specific circumstances to suggest this could happen.
Improbable; <3%; (1)	Likelihood of occurring is less than 3%. It would require a substantial change in circumstances to create an environment for this to occur, and even then, this is a rare occurrence.

Table 15 Consequence Definition

Consequence Type	Insignificant (1)	Minor (2)	Moderate (3)	High (4)	Major (5)
PMLU not being achieved	Lasting days or less; affecting small area (metres); groundcover affected with no loss of stability.	Lasting weeks; affecting limited area (tens of metres); groundcover affected on rehabilitated surfaces only and/or land slip of rehabilitated surface/profile or one incident of surface water quality deterioration.	Lasting months; affecting extended area (hundreds of metres); groundcover affected within Mine Activity Area only and/or erosion or slumping of rehabilitated surface/profile or successive incidents of surface water quality deterioration.	Lasting years; affecting area on Project area beyond the Mine Activity Area and undisturbed land; landform failure requiring re-mobilisation of rehabilitation efforts. Off lease impacts potential to cause environmental harm.	Permanent impact; affecting area beyond Project area and landholder property, reducing productivity of affected land permanently.

Table 16 Risk Level Matrix

Likelihood	Consequence Scale				
	Insignificant (1)	Minor (2)	Moderate (3)	High (4)	Major (5)
Almost Certain; >90%; (5)	5 (Medium)	10 (Significant)	15 (Significant)	20 (High)	25 (High)
Likely; 30% - 90%; (4)	4 (Medium)	8 (Medium)	12 (Significant)	16 (High)	20 (High)
Possible 10-29%; (3)	3 (Low)	6 (Medium)	9 (Medium)	12 (Significant)	15 (Significant)
Unlikely; 3% - 9% (2)	2 (Low)	4 (Medium)	6 (Medium)	8 (Medium)	10 (Significant)
Improbable; <3%; (1)	1 (Low)	2 (Low)	3 (Low)	4 (Medium)	5 (Medium)

The risk assessment outcome, including proposed mitigation measures are shown in Table 17.

Table 17 Risk Assessment for Achievement of PMLU

C = Consequence L= Likelihood R = Risk

RISK TO PMLU OUTCOME		Unmitigated Risk			Residual Risk			
Event	Cause	C	L	R	Mitigation	C	L	R
Revegetation fails	Weed invasion of rehabilitated areas	3	4	12	Complete weed eradication from topsoil stockpile prior to use. Ensure fertiliser use is slow release in native ecosystem PMLU's to allow native species to out compete weeds. Keep weed hygiene measures in place for entire rehabilitation activity schedule. Selective weed eradication on revegetated areas based on weed type and control susceptibility.	2	3	6
	Unsuitable seed blend used	3	3	9	Reseed area with appropriate seed mix if inundation or persistent water accumulation.	2	3	6
	Extended drought event	3	3	9	Reseed area in the first available wet season following extended drought.	2	2	4
	Vehicle access prior to appropriate timing	3	3	9	Maintain fence until rehabilitation achieved.	2	2	4
	Native fauna access prior to rehabilitation achievement	3	3	9	Install tree guards around base of immature tree/shrubs in critical areas.	2	2	4
Instability of landform surface	Soil loss from topsoiled areas	3	3	9	Installation of runoff controls to limit the potential for erosive events. Confirmation of final design profile over backfilled and topsoiled areas. Maintain fence until rehabilitation criteria met.	2	2	4
	Slumping of placed materials on slope	3	3	9	Confirmation of final design profile over backfilled and topsoiled areas. Where placed material meets in situ materials key into slope and install water management to direct runoff to dedicated structures and away from placed materials.	2	2	4
	Erosion and Sediment Control management controls fail	3	3	9	Maintain erosion and sediment control management installations throughout rehabilitation schedule and annually prior to each wet season. Inspect status of installations following wet season.	2	2	4
	Final landform design not suitable	3	3	9	Geotechnical assessment to confirm available material can be installed as stable and if not include benching to final profile to decrease slope angle and length.	2	2	4

9.3 Risk Treatment Plan

The basis for selection of the various risk treatments are recorded in Table 18. The risk mitigations are presented in approximate sequence of application for each cause. It is possible that early treatments may be sufficient for risk eradication and that the full range of options may not be necessary for the mitigative effect to be completed.

Table 18 Risk Treatment

RISK TO PMLU OUTCOME		Treatment of Risk		
Cause	Mitigation	Selection rationale	Actions and Performance measures	Reporting/Monitoring/Timing
Revegetation fails				
Weed invasion of rehabilitated areas	Complete weed eradication from topsoil stockpile prior to use.	Timely application of control in rehabilitation schedule	Apply suitable herbicide to weed infested areas seasonally.	Record weed status of stockpiled soils prior to re-spreading on regraded landforms.
	Ensure fertiliser use in native ecosystem PMLU's is slow release to allow native species to out compete weeds.	Meets native species recommended outcome	Source suitable fertiliser for use throughout rehabilitation period	Record rate of use and weed emergence.
	Apply weed hygiene measures for entire rehabilitation activity schedule.	Protection of surrounding environment	Keep operational weed hygiene measures in place for entire rehabilitation activity schedule.	Record equipment and maintain hygiene records
	Selective weed eradication on revegetated areas based on weed type and control susceptibility.	Protection of surrounding environment	Surveillance of rehabilitation areas for weed emergence	Record weed emergence
Extended drought event	Reseed area in the first available wet season following extended drought.	Cost-benefit in post-closure period.	Check Ipswich rainfall records to confirm suitable conditions	Record timing and rate of seed application.

RISK TO PMLU OUTCOME		Treatment of Risk		
Cause	Mitigation	Selection rationale	Actions and Performance measures	Reporting/Monitoring/Timing
Vehicle access prior to rehabilitation achievement	Maintain fence or demarcation until rehabilitation criteria are met.	Timely application of control in rehabilitation schedule	Maintenance inspections to ensure integrity of fence.	Implement prior to completion of rehabilitation works.
Native fauna access prior to rehabilitation achievement	Install tree guards around base of immature tree/shrubs in critical areas.	Cost-benefit in post-closure period	Observations of growth and groundcover to include signs of predation on emerging vegetation	Photo-monitoring of emerging tree/shrubs
Instability of regraded surface				
Soil loss from topsoiled areas	Installation of runoff controls to limit the potential for erosive events.	Timely application of control in rehabilitation schedule	Final landform design plan/schematic to include location and materials for installation	Photo-monitoring of installed feature
	Confirmation of final design profile over backfilled and topsoiled areas	Timely application of control in rehabilitation schedule	Measure profiles as installed, prior to topsoiling and revegetating final landforms	Photo-monitoring of completed earthworks
Slumping of placed materials on slope	Confirmation of final design profile over backfilled and topsoiled areas	Timely application of control in rehabilitation schedule	Measure profiles as installed, prior to topsoiling and revegetating final landforms	Photo-monitoring of completed earthworks
	Where placed material meets in situ materials key into slope and install water management to direct runoff to dedicated structures and away from placed materials.	Timely application of control in rehabilitation schedule	Final landform design plan/schematic to include areas for keying and locations for installation of water management structures	Photo-monitoring of completed earthworks

10 Monitoring and Maintenance

The program of monitoring and maintenance of the milestones and milestone criteria are presented in Table 19. Monitoring will occur after the completion of actions specified in the milestone criteria.

Table 19 Rehabilitation Milestone Management and Rehabilitation Criteria Monitoring Program

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
RM1	RM1 Infrastructure Removal	1. All concrete, bitumen and gravel removed, where not required 2. All non-required fencing removed 3. All machinery and equipment removed 4. All non-required surface water drainage infrastructure removed 5. All waste removed	Photo of location with date
RM2	RM2 Landform development and reshaping / reprofiling	1. Batter slopes and benches achieve final landform design 2. All major earthworks completed 3. Settlement monitoring installed 4. Sediment and erosion control structures in place	Site survey records Compaction testing records Settlement monitoring locations surveyed by AQP Assessment report by AQP
RM3	RM3 Surface Preparation	1. Earthworks completed 2. Adequate topsoil material spread over shaped surfaces or ameliorants applied to subsoils to achieve vegetative cover 3. An assessment of soil health and suitability has been completed by an appropriately qualified person to confirm soil is suitable for target vegetation establishment.	Site survey records Photo of location with date Soil assessment report by AQP
RM4	RM4 Revegetation (Residential/ Industrial)	1. Seeding completed (cover crop), where alternative surface cover (subject to Council development approvals) is not to be installed.	Photo of location with date
RM5	RM5 Revegetation (Native Ecosystem)	1. Revegetation plan for native ecosystem PMLU areas completed, including site condition assessment of existing buffer areas/undisturbed vegetation in highway verge and selection of reference sites.'	Report by AQP Record of actions and amount applied Field assessment by AQP

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
		2. Completed seeding of target species per revegetation plan.	
RM6	RM6 Achievement of Surface Requirements (Residential/ Industrial)	1. Groundcover >70% where revegetation works have been conducted 2. Weed presence is at a maximum of 10 % of total vegetation cover 3. No active areas of rill or gully erosion and drainage follows appropriate drainage paths 4. No erosion classification of Severe or Extreme	Field assessment by AQP Statement by AQP Photo of location with date
RM7	RM7 Achievement of Surface Requirements (Native Ecosystem)	1. Revegetation >40% comparable to reference site. 2. Weed presence is at a maximum of 10 % of total vegetation cover 3. No active areas of rill or gully erosion and drainage follows appropriate drainage paths 4. No erosion classification of Severe or Extreme	Field assessment by AQP Record of rehabilitation monitoring Statement by AQP Photo of location with date
RM8	RM8 Achieved PMLU to stable condition (Residential/ Industrial)	1. Certification from an appropriately qualified person that the area has achieved stable condition (including settlement monitoring where required to be installed). 2. Areas determined to be suitable for proposed use as assessed by an appropriately qualified person. 3. Development approval granted for residential and/or industrial use, as applicable	Geotechnical Report Statement by AQP Council DA Approval
RM9	RM9 Achieved PMLU to stable condition (Native Ecosystem)	1. Certification from an appropriately qualified person that the area has achieved stable condition 2. Groundcover >60% or as otherwise specified by the revegetation plan 3. Certification of no weed and pest species abundance identified in rehabilitated areas are no greater than at reference sites.	Field assessment by AQP Record of rehabilitation monitoring Statement by AQP

Milestone Reference	Rehabilitation Milestone	Milestone Criteria	Method of monitoring
		4. No erosion classification of Severe or Extreme	
RM10	RM10 Achieved PMLU (Permanent Infrastructure)	1. Final landform survey confirms no structures or equipment remain other than those documented in a landholder agreement or specified by the <i>Electricity Act 1994</i>. 2. All contaminants removed or remediated. 3. No erosion classification of Severe or Extreme. 4. Landform shows suitable slope gradients e.g. <20% except to connect with surrounding natural topography. 5. Hazard and Safety Assessment completed by an appropriately qualified person demonstrating hazards in rehabilitation areas are consistent with the nature and severity of hazards typical of neighboring equivalent land use. Identified residual hazards are low risk with no significant increase in risk expected over time. 6. Agreement with Powerlink regarding maintenance of power line easement	Statement from AQP Photo of location with date Landholder Agreement Hazard and Safety Assessment Agreement from DEPW
RM11	RM11 Achieved PMLU (Scientific Purposes)	1. Final landform survey confirms no structures or equipment remain other than those documented in a landholder agreement 2. All contaminants removed or remediated. 3. No erosion classification of Severe or Extreme. 4. Water discharges of suspended solids in the stormwater released from the lease area consistently meet 50mg/L. 5. Agreement with Council regarding maintenance of sediment trap.	Site survey records Statement from AQP Water monitoring records Council Agreement

11 References

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PART B — ATTACHMENTS PRCP SCHEDULE

Appendix 1 – PRCP Schedule
Appendix 2 – EPML00634213 – Land Outcome Document

Chum Street Pty Ltd; ML 4553, ML 4559, ML 4714, ML 50077

Appendix 1 – PRCP Schedule

Chum Street Pty Ltd; ML 4553, ML 4559, ML 4714, ML 50077

Appendix 2 – EPML00634213 – Land Outcome Document