BATCHFIRE CALLIDE

Batchfire Resources Pty Ltd

Callide Mine

Progressive Rehabilitation and Closure Plan

Revision 3 (8 May 2026)

Submission Date: 8 May 2026

Project Name	Batchfire Callide Mine - Progressive Rehabilitation and Closure Plan			
Document ID	Callide Mine PRCP v3.0.pdf			
Environmental Authority (EA) Permit Number	EPML00720413			
EA Permit Holder	BATCHFIRE CALLIDE PTY LTD BATCHFIRE CALLIDE NO. 2 PTY LTD			
EA Holder Registered Address	'S2', Level 11, 141 Queen Street, Brisbane QLD 4000			
Site Name	Callide Mine			
Tenures	ML5632 ML5641 ML5653 ML5654 ML5655	ML5662 ML6993 ML6994 ML700059 ML80030	ML80092 ML80093 ML80107 ML80115 ML80117	ML80118 ML80122 ML80151 ML80186 ML801170

Version History

Version	Description	Date of Submission
1	Final	28 April 2023
2	Revised to address NPM notice	29 July 2024
3	Revised to address DETSI Information Request	8 May 2026

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1 Introduction

This Progressive Rehabilitation and Closure Plan (PRCP) has been prepared for the Callide Mine in accordance with the transition notice issued on 21 April 2021, under section 754 of the *Environmental Protection Act 1994* (Qld) (EP Act). This notice was issued to Batchfire Callide Pty Ltd and Batchfire Callide No. 2 Pty Ltd (the Environmental Authority (EA) holders).

This PRCP has been developed in accordance with the requirements of section 126C and 126D of the EP Act and associated *Environmental Protection Regulation 2019* (Qld) (EP Regulation) and the following guidelines and information sheets prepared by the Department of the Environment, Tourism, Science and Innovation (DETSI):

- Guideline: Progressive Rehabilitation and Closure Plans – version 3.00 (DES, 2023);
- Information Sheet: Non-Use Management Areas – version 1.01 (DESI, 2024c);
- Information Sheet: Common Issues with PRCP Applications - version 1.01 (DESI, 2024a);
- Information Sheet: Voids in Flood Plains – version 1.01 (DESI, 2024d); and
- Information Sheet: Community Consultation for PRCP – version 1.01 (DESI, 2024b).

This PRCP comprises two components:

- The Rehabilitation Planning Part (this document); and
- The PRCP Schedule (Appendix A), prepared in the approved statutory template (DES, 2019b).

Together, these documents establish a clear pathway for progressive rehabilitation and final closure of the mine.

The PRCP is structured as follows:

- Section 1: Introduction;
- Section 2: Rehabilitation Planning Part;
- Section 3: Community Consultation;
- Section 4: Post-Mining Land Use;
- Section 5: Non-Use Management Areas;
- Section 6: Rehabilitation Management Methodology;
- Section 7: Risk Assessment;
- Section 8: Rehabilitation Trials;
- Section 9: Monitoring and Maintenance;
- Section 10: PRCP Schedule;

The objective of this PRC Plan is to provide a roadmap for progressive rehabilitation and closure of the Callide Mine to achieve a safe, stable and non-polluting final landform which satisfies the requirements of sections 126C and 126D of the *Environmental Protection Act 1994* (EP Act) and other relevant legislation.

Progressive rehabilitation will be undertaken to maximise the area of land returned to a stable condition at the earliest practicable time, consistent with section 112 of the EP Act.

1.1 Transitional Provisions

At commencement of the *Mineral and Energy Resources (Financial Provisioning) Act 2018*, the EA holders were existing mining EA holders for the purposes of Chapter 13, Part 27 of the EP Act and are therefore subject to the transitional PRCP requirements.

The transitional provisions prescribe how existing EA holders are required to transition into the Progressive Rehabilitation and Closure Plan (PRCP) framework. This process is summarised, and additional guidance provided, in Section 6 of the *Guideline – Progressive rehabilitation and closure plans* (ESR/2019/4964), which applies to "existing EA holders who must transition into the new PRC Plan framework".

In accordance with the transitional provisions of the EP Act and the requirements of Section 6 of the PRCP Guideline, Batchfire Callide has followed the process outlined below to transition rehabilitation and closure outcomes from the EA (EPML00720413) into the draft PRCP schedule:

1. Identifying rehabilitation and closure outcomes in the Land Outcome Document (LOD) for EA EPML00720413.
2. Identifying post-mining land uses (PMLUs).
3. Identifying non-use management areas (NUMAs).
4. Defining rehabilitation areas (RAs) within PMLUs, or improvement areas (IAs) within NUMAs.
5. Identifying milestones.
6. Identifying milestone criteria.
7. Identifying commencement and completion dates for the first rehabilitation milestone (RM) and management milestone (MM).

The proposed PRCP Schedule has been prepared to reflect all existing approved disturbance and closure outcomes under EA EPML00720413 and aligns those outcomes with the statutory PRCP framework.

1.2 Transitional Timeline

The timeline of the key steps in the assessment process for this transitional PRCP includes:

- A pre-lodgement meeting with the administering authority for the Callide Mine PRCP was held on 3 February 2021, with a follow-up meeting on 29 March 2021.
- A Transition Notice was issued by the administering authority, dated 21 April 2021, which required submission of the proposed PRCP by 28 October 2022.
- The Transition Notice was amended on 30 September 2022 to enable a 6-month extension of time to submit the proposed PRCP, to 1 May 2023.
- The Callide Mine PRCP was submitted to the administering authority on 28 April 2023.
- The administering authority issued a Not Properly Made notice on 15 May 2023.

- The Callide Mine PRCP was resubmitted on 29 July 2024.
- An Information Request Notice was issued to Batchfire Callide Pty Ltd by the administering authority, dated 26 September 2024, with a response to the information request required by 12 May 2025.
- A pre-lodgement meeting of the information request response was held on 7 May 2025, with written request to extend the information response period from 12 May 2025 to 8 May 2026.
- This Decision on the request to extend the information period was issued on 9 May 2025, extending the information request period to 8 May 2026.
- Prior to the PRCP submission, a pre-lodgement meeting between the administering authority and Callide Batchfire was held on 24 March 2026. This was arranged to discuss the key content of the site's draft plan, aimed at identifying any notable gaps or refinements needing to be addressed prior to the final submission.
- A final version of the transitional PRC plan was submitted to the administering authority on 8 May 2026.

2 Rehabilitation Planning Part

2.1 Project Description

2.1.1 Geographic Location

The Callide Mine is located approximately 20 km north of Biloela, and 120 km southwest of Gladstone in Central Queensland (Figure 1).

2.1.2 Type of Mining Operation

The Callide Mine comprises of four discrete open cut coal mines (Figure 2), detailed in Section 2.1.3, utilising both draglines and truck and shovel fleets.

Mining activities at Callide Mine involve the removal and stockpiling of topsoil, drilling and blasting of overburden and interburden, mining of overburden and interburden by draglines and truck and shovel fleets, and mining of the coal by truck and shovel fleets. The overburden and interburden is placed in spoil dumps both within the mined-out void (in-pit dumps) and in out-of-pit dumps. Coal is hauled from the pits to the CHP, or to designated stockpiles on ROM pads. The coal is processed at either the Boundary Hill CHP or the Dunn Creek CHP.

The mine produces low-sulphur, sub-bituminous thermal coal that is predominantly used to supply Queensland's domestic power demands via the adjacent Callide Power Station. Mined coal is also exported to the international market, and can also be used in the power generation for alumina refining in Gladstone.

2.1.2.1 Proposed duration of Mining Operations

Mining at the Callide Mine commenced in 1944 and has continued through successive stages of development. The mine has an annual production rate of approximately 10.5 million tonnes of product coal per annum. For the purposes of this PRCP, the proposed duration of mining operations is until 2047.

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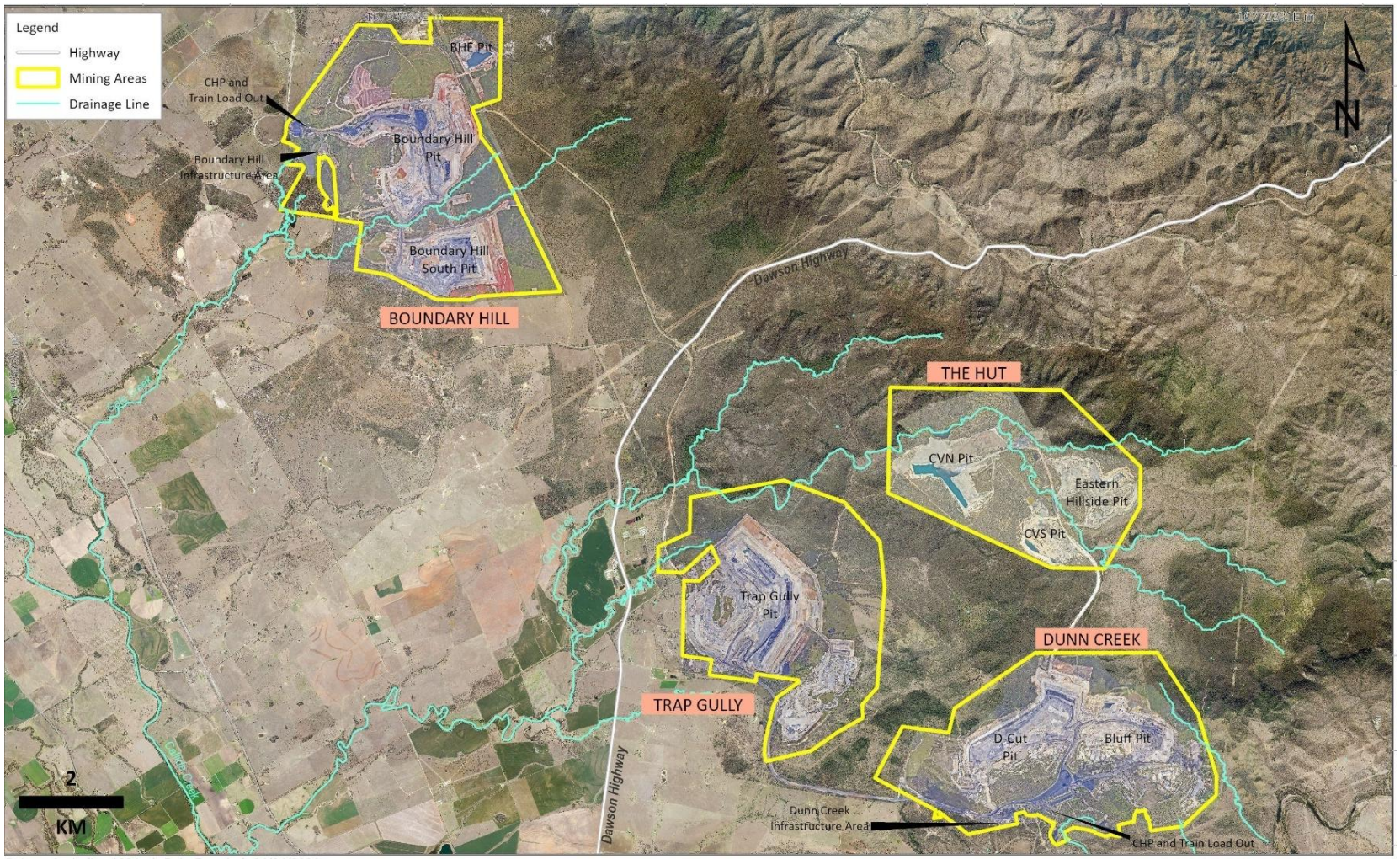
CALLIDE MINE LOCATION
FIGURE 1

Figure 1: Callide Mine Location



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Site Layout
FIGURE 2

Figure 2: Site Layout

2.1.3 Primary mine features and infrastructure on-site

Callide Mine comprises four discrete open cut mining areas as shown in Figures 3 to 6.

2.1.3.1 Dunn Creek mining area

Mining commenced in the Dunn Creek mining area in 1944 (Figure 3).

- Coal is currently mined in Dunn Creek Pit (the western pit) and The Bluff Pit (the eastern pit). Mining operations involve a dragline and truck and shovel pre-stripping.
- The primary infrastructure area for Callide Mine is located at the Dunn Creek mining area and includes a coal processing area and a Mine Industrial Area (MIA). The coal processing area includes a Coal Handling Plant (CHP), run-of-mine (ROM) and product coal stockpiles, conveyors and train loading facilities. The MIA includes administration buildings and offices, and workshops and maintenance facilities, a sewage treatment plant (STP) and an explosives magazine. ROM coal from Dunn Creek, Trap Gully and The Hut is hauled to the Dunn Creek CHP. Once crushed in the CHP, coal is either conveyed to the nearby Callide Power Station or loaded onto trains and transported to Gladstone.

2.1.3.2 Trap Gully mining area

Mining commenced in the Trap Gully mining area in 1981 (Figure 4).

- Coal is mined in a single open cut pit (Trap Gully Pit) using a dragline and truck and shovel fleet. ROM coal from Trap Gully is hauled to the Dunn Creek CHP for crushing and transport from site.
- Mine infrastructure at Trap Gully includes haul roads, water fill station, ROM coal pads, mine water dams, and an explosives storage facility

2.1.3.3 The Hut mining area

Mining commenced at The Hut mining area in 1990, with three open cut pits, Central Valley North (CVN) Pit, Central Valley South (CVS) Pit and Eastern Hillside Pit (Figure 5).

- This mine area is currently unmined, although when in production, ROM coal from The Hut is hauled to the Dunn Creek CHP for crushing and transport from site.
- Mine infrastructure at The Hut includes haul roads, a laydown area, ROM coal pad and mine water dams.

2.1.3.4 Boundary Hill mining area

Mining commenced at Boundary Hill mining area in 1983 (Figure 6). While it forms part of Callide Mine, Boundary Hill operates as a standalone mining area, independent of the three other mining areas.

- Coal is currently mined in Boundary Hill South (BHS) Pit and the Campbell's Creek Pit using a dragline and truck and shovel fleet. ROM coal is hauled from the pits to an in-pit CHP (also called 'the Stamler') for crushing. Crushed coal is then conveyed to the Boundary Hill train load out facility and transported to Gladstone. A mine infrastructure area (MIA) is located at Boundary Hill including a crib room, administration building and workshops, a STP and an explosives magazine
- Open cut mining in the Boundary Hill North Pit and the Boundary Hill East Pit has been completed.

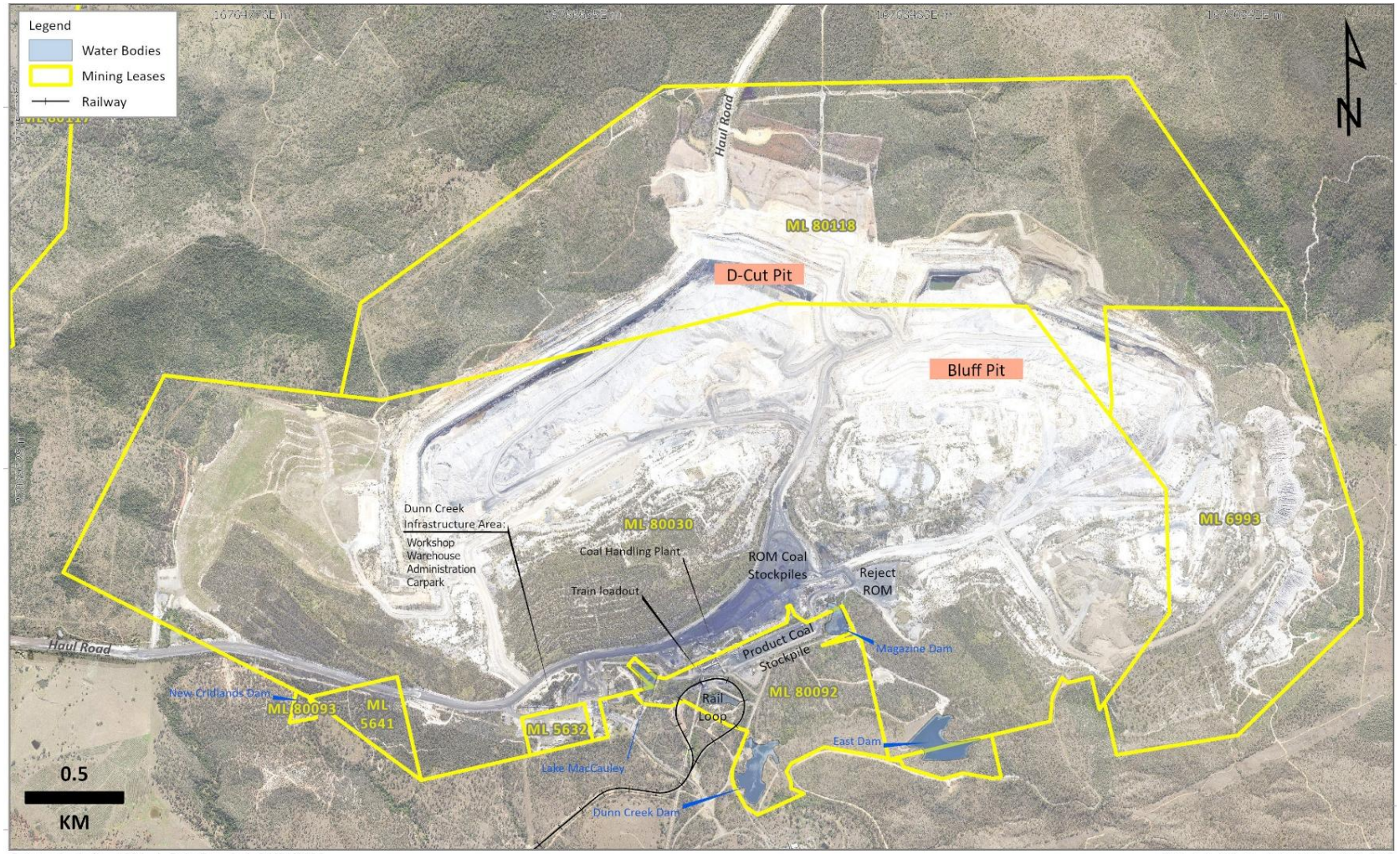


Figure 3: Dunn Creek Leases and Infrastructure

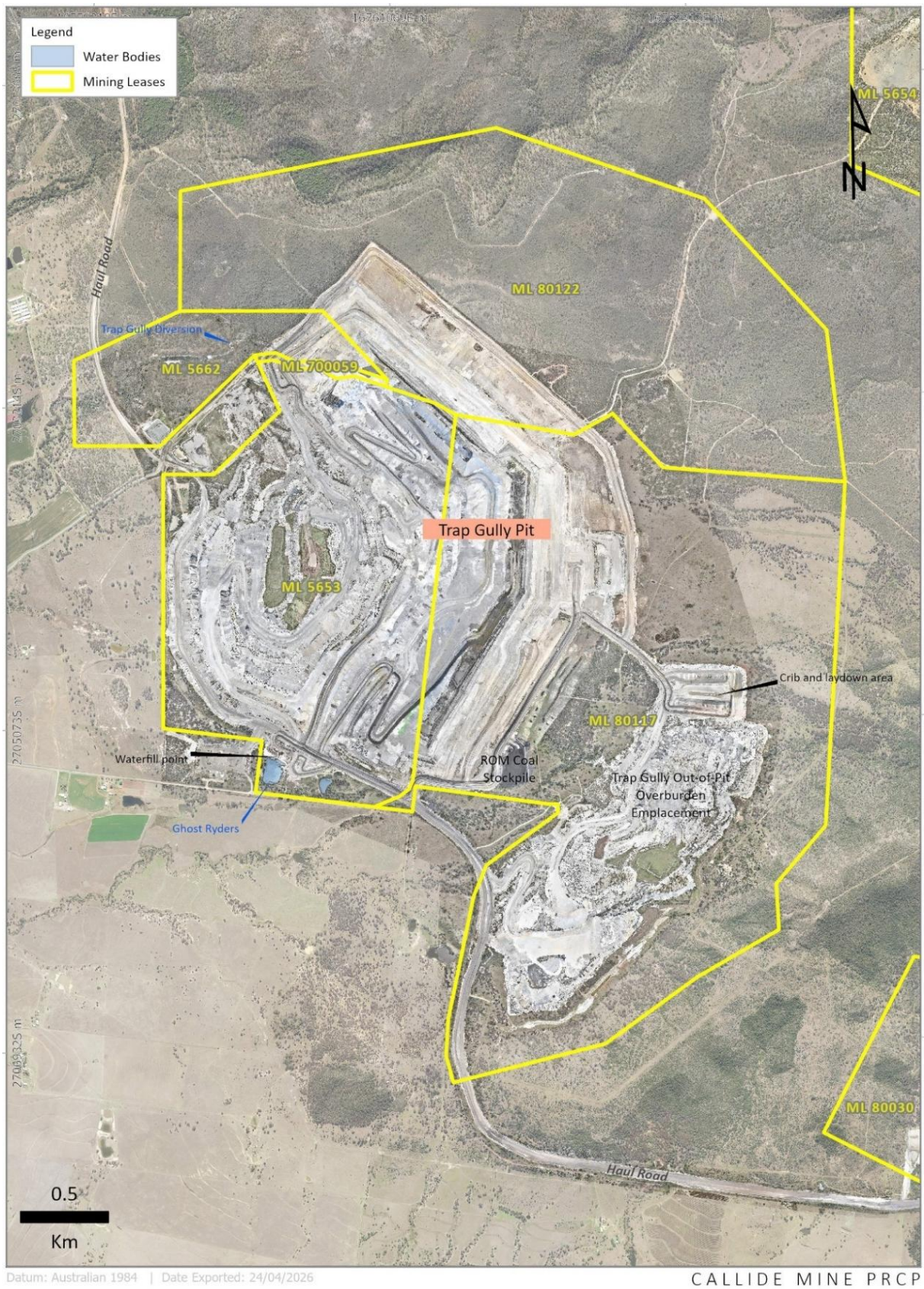


Figure 4: Trap Gully Leases and Infrastructure

Figure 5: The Hut Leases and Infrastructure

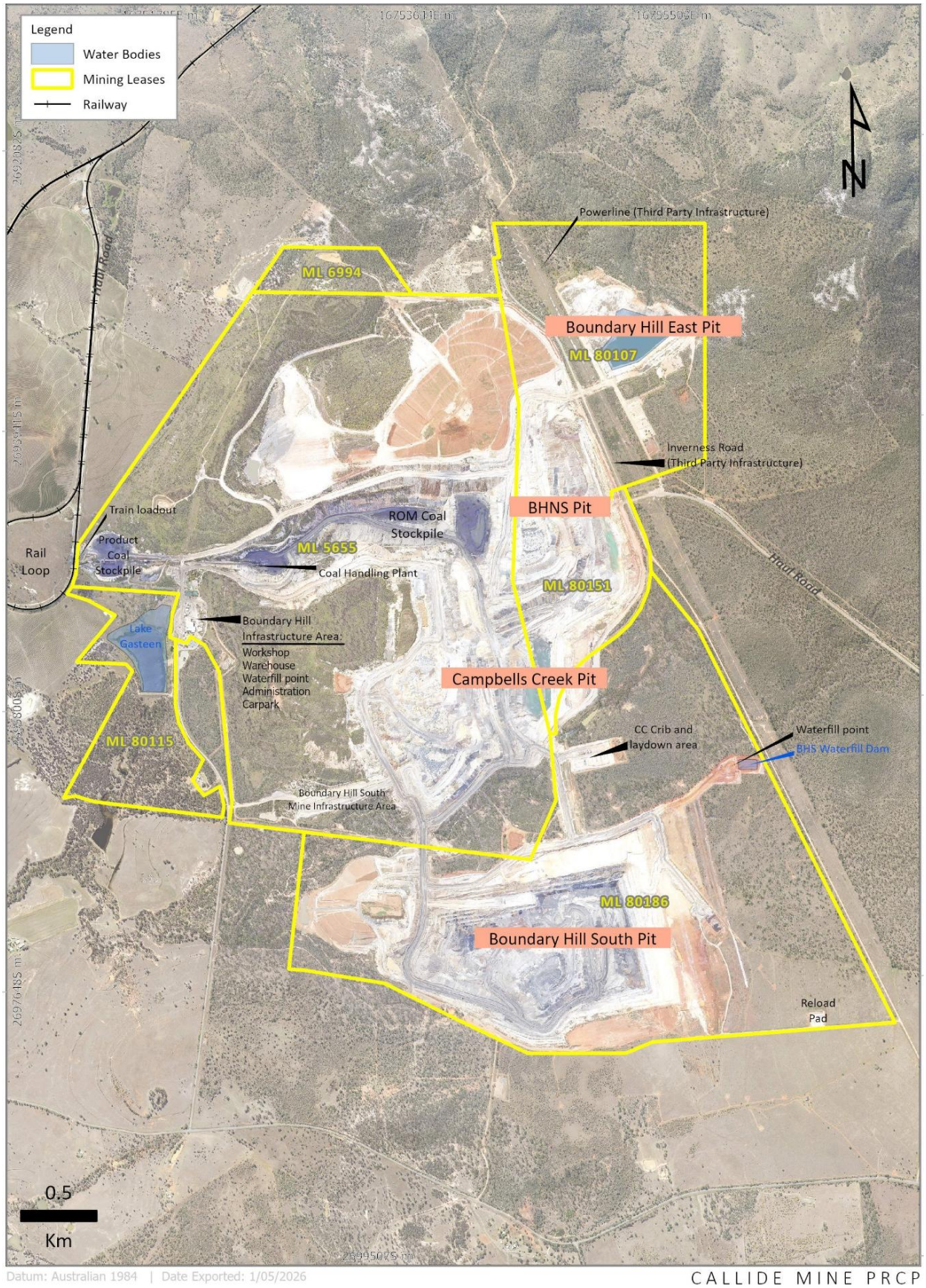


Figure 6: Boundary Hill Leases and Infrastructure

2.1.4 Resource Tenements

Callide Mine is owned and operated by Batchfire Resources Pty Ltd (Batchfire) in accordance with the Callide Mine EA (EPML00720413).

Table 1 lists the resource tenements that make up the Callide Mine, all of which are held by the proponent. The Mining Leases (MLs) for each mining area are shown on Figures 3 to 6.

Table 1: Mining Tenements held by Batchfire

Mining Lease (ML)	Tenure Expiry Date	Area (Ha)
MINING AREA: DUNN CREEK		**1,713**
ML5632	31/07/2031	6
ML5641	30/06/2037	13
ML80030	31/03/2044	920
ML80092	31/12/2044	72
ML80093	31/03/2044	1
ML80118	31/12/2028	488
ML6993	31/12/2044	212
MINING AREA: TRAP GULLY		**1,562**
ML5653	30/11/2023	323
ML5662	30/11/2032	73
ML80117	31/07/2029	688
ML80122	31/07/2027	474
ML700059	31/10/2045	3
MINING AREA: THE HUT		**1,314**
ML5654	31/05/2028	1,314
MINING AREA: BOUNDARY HILL		**1,865**
ML5655	30/09/2044	822
ML6994	30/11/2025*	25
ML80107	30/09/2044	230
ML80115	31/03/2026*	83
ML80151	31/12/2030	86
ML80186	31/01/2043	619

** Renewal has been lodged*

2.1.5 Environmentally Relevant Activities

Environmentally Relevant Activities (ERAs) (defined under the EP Act) are activities that will, or have the potential to, release contaminants into the environment which may cause environmental harm.

In accordance with EA EPML00720413, the Callide Mine is approved to conduct the below ERA's:

- Resource activity 13 – Mining black coal;
- Ancillary 08 – Chemical storage 3: storing more than 500m^3 of chemicals class C1 or C2 combustible liquids under AS1940 or dangerous goods class 3 under subsection (1)(c);
- Ancillary 08 – Chemical storage 5: storing 200m^3 or more of chemicals that are liquids, other than chemicals mentioned in items 1 to 3, under subsection (1)(d);
- ERA 33 – Crushing, Milling, Grinding or Screening for crushing, griding, milling or screening more than 5,000 t of material in a year; and
- ERA 63(1)(b)(i) – Sewage Treatment for operating a sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 but not more than 1,500 Equivalent Persons (EP) if treated effluent is discharged from the works to an infiltration trench of through an irrigation scheme.

2.2 Baseline information

As detailed in Section 2.1.2.1, mining commenced at Callide Mine in 1944. Callide Mine has progressively expanded across the four mining areas since this time. Baseline information has been developed and approvals sought in accordance with the legislative requirements in place at the time of each individual approval, including through EA applications and amendments and Environmental Impact Statement (EIS) processes.

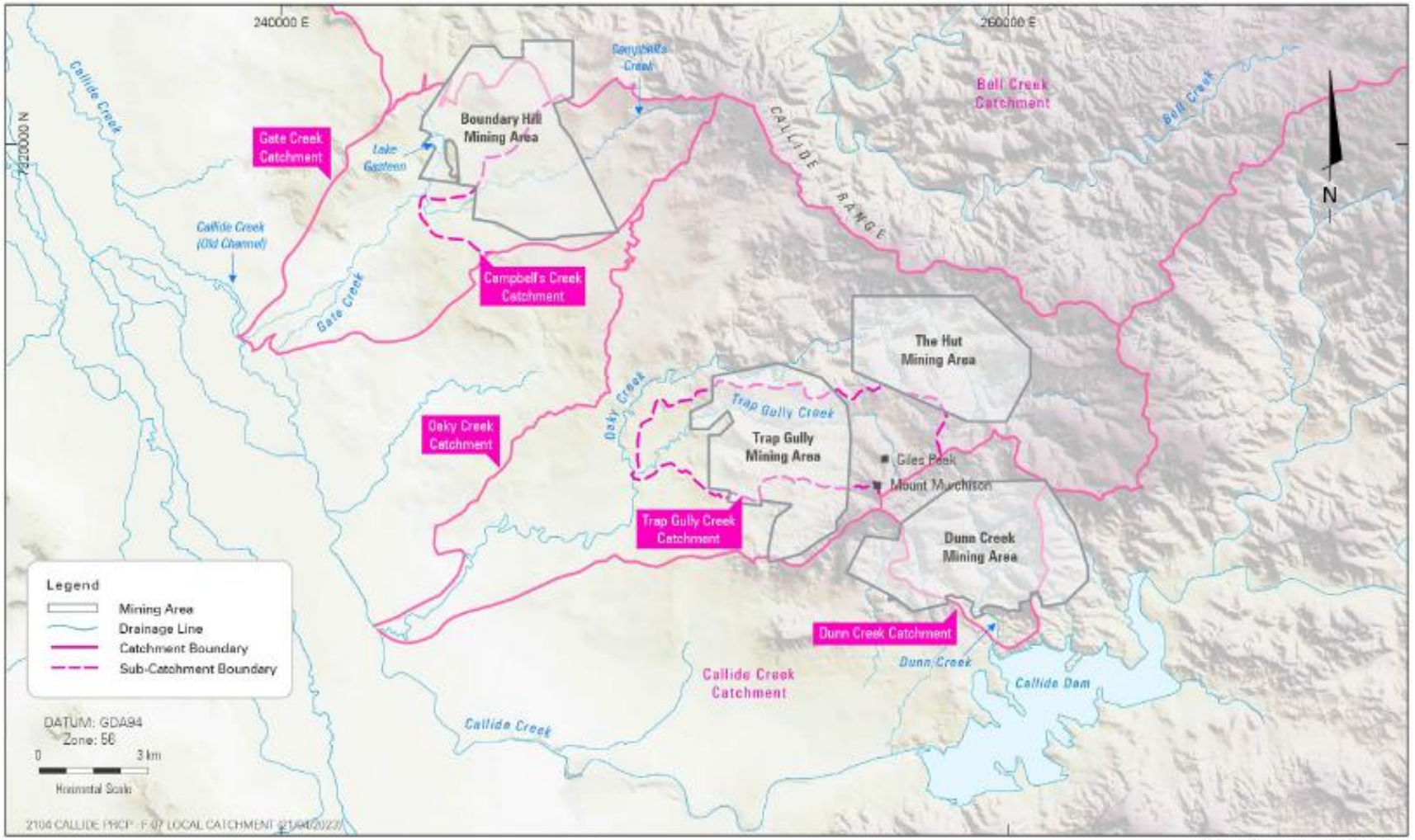
Baseline information relevant to rehabilitation planning has been reviewed and summarised in this PRCP. Historical datasets of varying age have been relied upon where appropriate and supplemented by contemporary monitoring data where available. Pre-disturbance information has been included to the extent necessary to inform rehabilitation objectives and PMLU suitability.

2.2.1 Site Topography

The topography in the vicinity of the mine transitions from the elevated Callide Range in the north-east to the lower lying Callide Creek floodplain in the south-west (Figure 7). An escarpment and several peaks including Mount Murchison (elevation 520 mAHD) and Giles Peak extend from the Callide Range into the mine site (Figure 7).

The natural topography within and surrounding the Callide mining areas ranges from steeply sloping areas within the Callide Timber Reserve, to gently undulating grazing land in the western areas.

Local drainage features are characterised by incised banks and have been significantly degraded by historical clearing and cattle grazing activities. The local drainage is discussed in Section 2.4.2. The local topography and surface drainage are shown in Figure 7.



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Local Catchment Setting

FIGURE 7

Figure 7: Local Catchment Setting

2.2.2 Climate

2.2.2.1 Regional

The climate of the region is subtropical with moderately dry winters and wetter summers. The region is subject to climatic extremes, including drought, flooding, bushfires and cyclones.

2.2.2.2 Local

The climate at the Callide Mine is sub-tropical, characterised by high variability in rainfall, temperature, and evaporation, typical of Central Queensland.

The nearest Bureau of Meteorology (BoM) weather station is the Thangool Airport weather station (station number 039089), located approximately 20km south of the Callide Mine.

2.2.2.3 Rainfall

The average annual rainfall at the Thangool Airport weather station is 655 mm. Rainfall at this location shows marked annual and seasonal variability with dominant weather cycles of varying duration of drought followed by wet years.

The seasonal average rainfall is 280.2 mm in summer, 135.1 mm in autumn, 83.1 mm in winter and 157.5 mm in spring (BoM, 2025). The region shows a pronounced wet season with most of the rainfall occurring between November to March, although variations in monthly rainfall can be extreme (Chart 1).

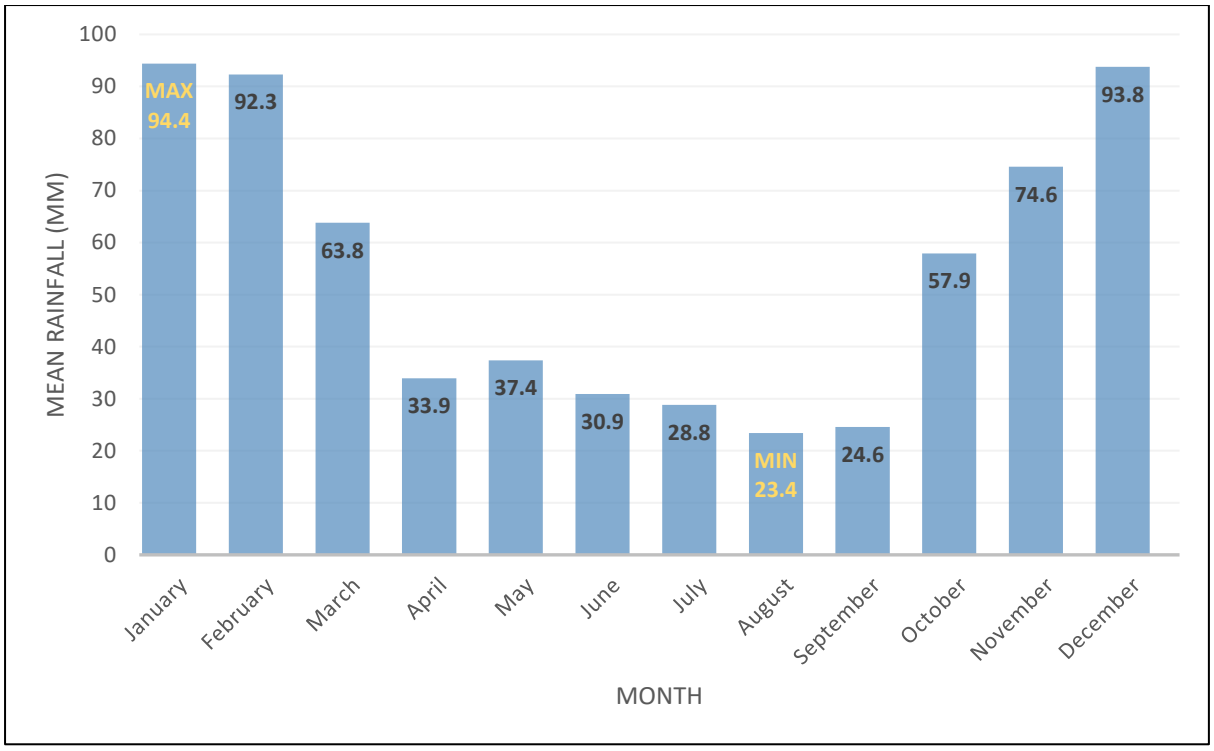


Chart 1: Mean Monthly Rainfall at BoM039089, Thangool for Callide Mine

2.2.2.4 Temperature

The highest monthly mean daytime temperatures (36°C to 37°C) occur between December and February, and the lowest monthly mean daytime temperatures (20°C to 23°C) occur between June and August (Chart 2).

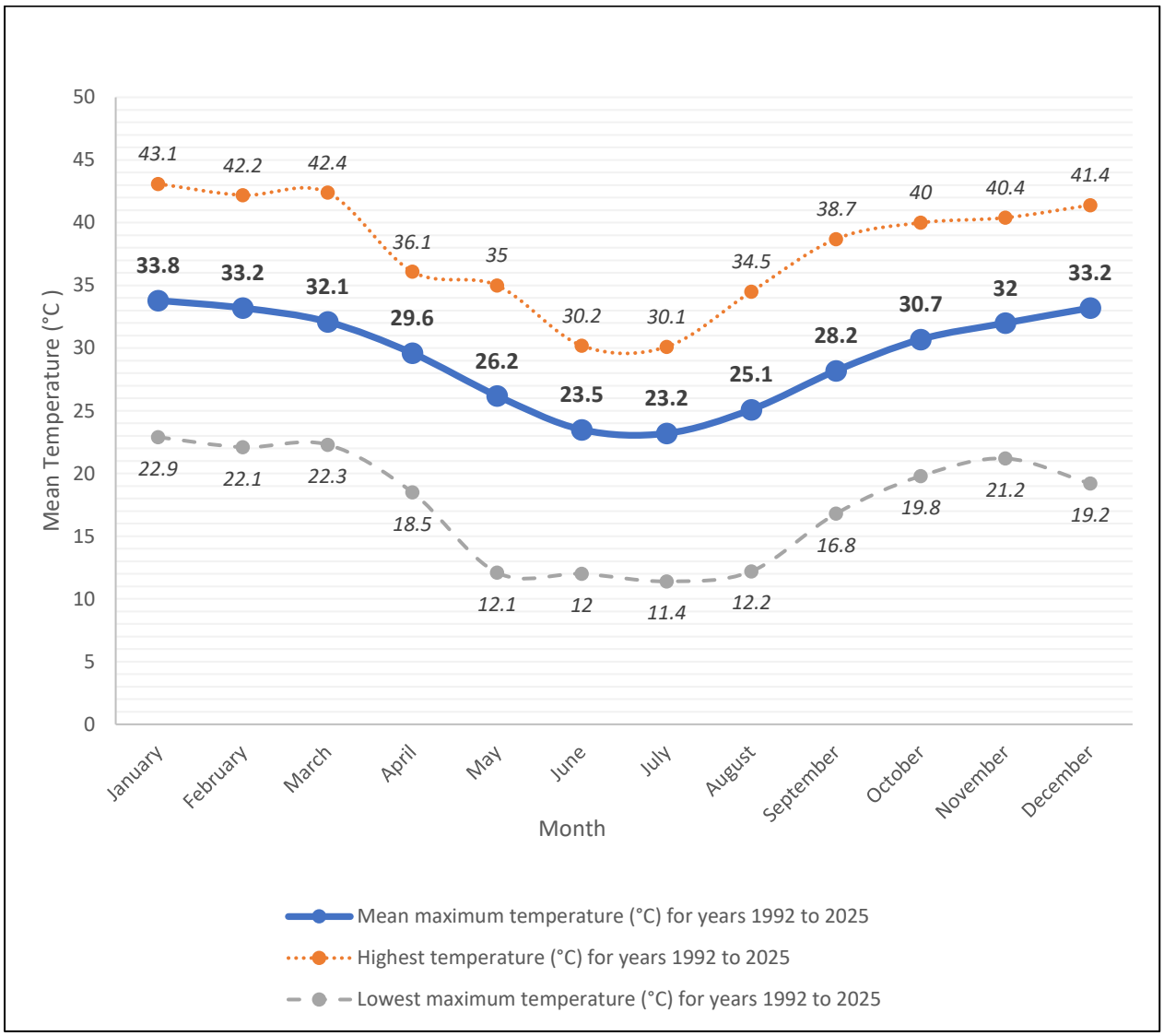


Chart 2: Mean Monthly Temperature at BoM039089, Thangool for Callide Mine

2.2.2.5 Evaporation

A combination of high temperatures and low humidity results in high evaporation rates across the Callide Valley in the summer months. Average daily pan evaporation is highest in December (7.4 mm) and lowest in June (2.9 mm), with an average annual pan evaporation of 2,005 mm.

2.2.2.6 Wind

Prevailing winds are east to southeast between January and April, moving to south to southeast between May and August, then north to northeast from September to December. Average daily wind speed varies between 2.4 and 3.0 m/s throughout the year.

2.2.2.7 Long-term climate projections

The Future Climate Dashboard (Queensland Government, 2021) shows the mean temperature in the region increasing by approximately 3°C by 2070. Evaporation is predicted to increase by approximately 1.2 mm/day by 2070, and rainfall is expected to decrease by approximately 0.02 mm/day by 2070.

2.3 Geological Setting

Callide Mine is located in the Callide Basin, which is a discrete sedimentary geological basin that is localised within a half graben structure and bounded on all sides by basement rocks. The sedimentary rocks of the Callide Basin are therefore geologically isolated from contemporaneous rocks elsewhere in the region.

The Callide Basin comprises two geological formations, namely the Callide Coal Measures and the overlying Precipice Sandstone. These formations are undeformed basin-fill strata and do not exhibit any major faulting or folding. The Callide Basin is up to 200 m thick in the centre and thins towards the basin margins.

During the early Tertiary period, the Callide Basin was blanketed by sedimentary deposits of the Biloela Formation. Tertiary volcanism deposited basalt that caps the elevated areas of the basin.

The exposed surfaces of the sedimentary formations and basalt were subsequently modified by extended periods of erosion, weathering and mineralisation. This has resulted in the development of a deep weathered profile (up to approximately 100 m thick), localised surface duricrust and thin residual sheetwash and creek deposits.

The surface geology is shown in Figure 8. The local stratigraphy includes (in descending order from youngest to oldest):

- Recent residual surface sediments;
- Tertiary basalt;
- Biloela Formation;
- Precipice Sandstone;
- Callide Coal Measures, including the target coal seams; and
- The underlying basement rocks.

A detailed description of the local stratigraphy and lithology is provided in the Groundwater Report (Appendix D).

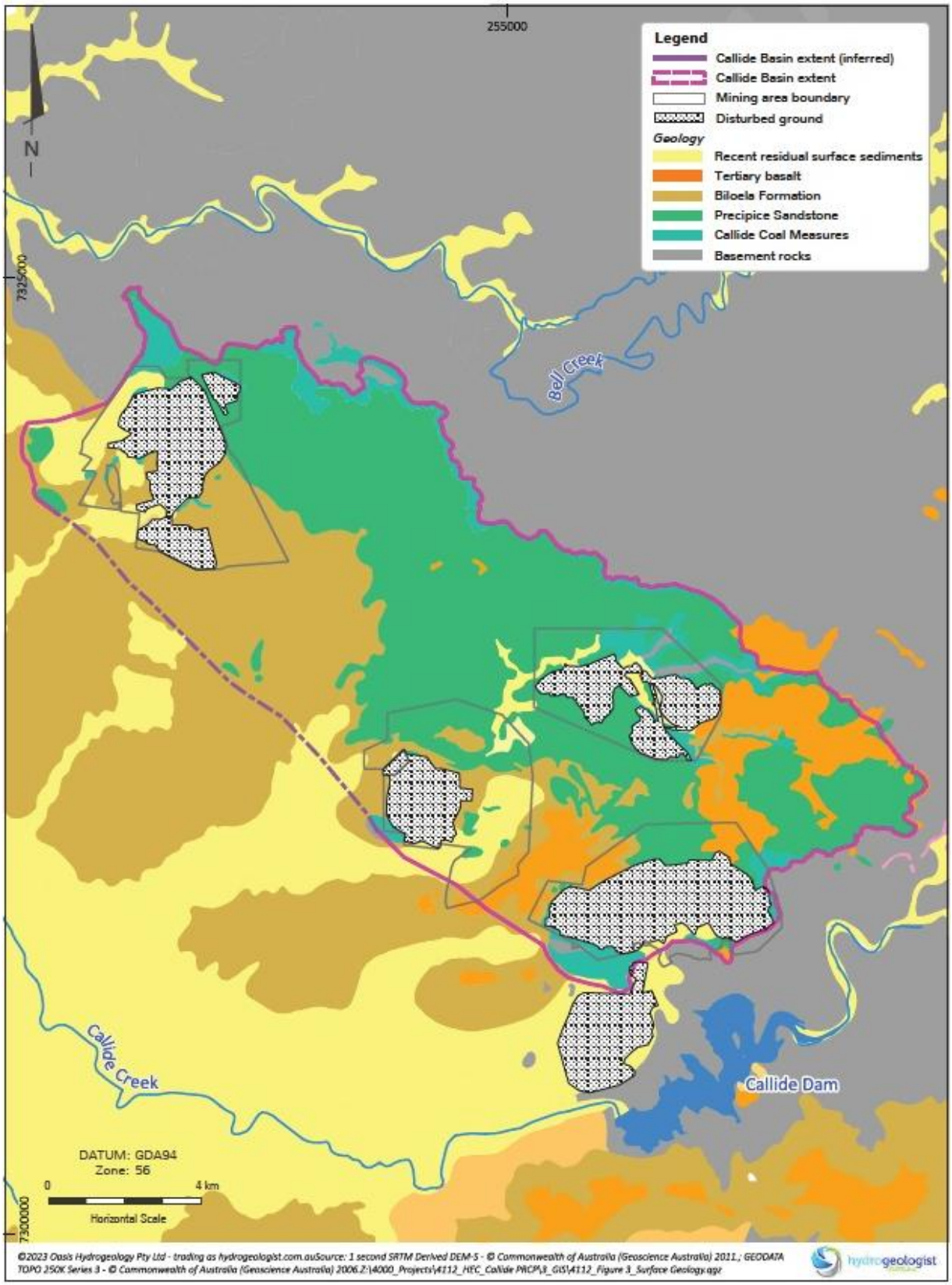


Figure 8: Surface Geology

2.4 Site Hydrology and Fluvial Networks

This section provides an overview of the catchment and drainage setting for the Callide Mine.

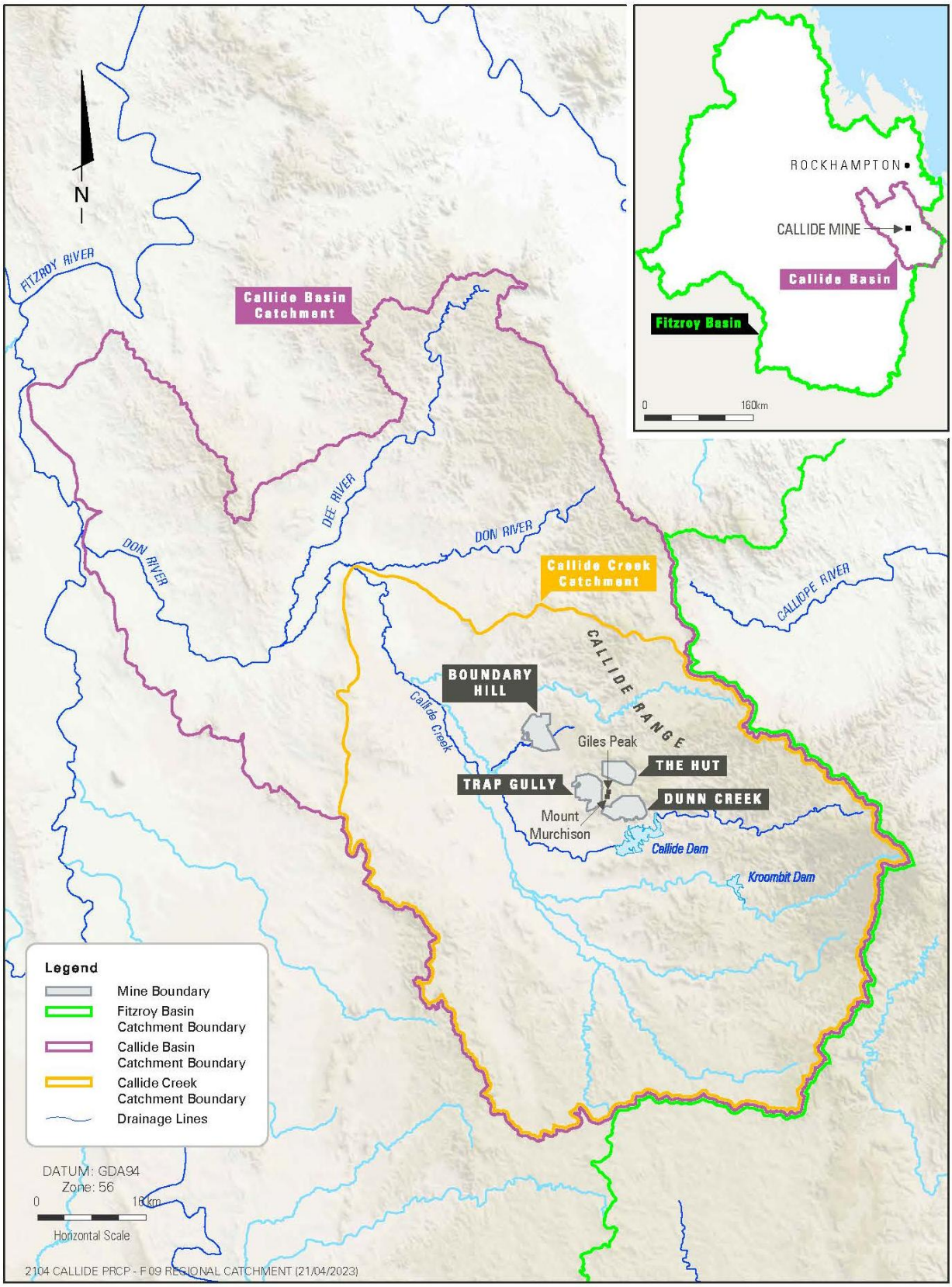
2.4.1 Regional Setting

Callide Mine is located within the Callide Creek catchment of the Callide Basin, in the upper Fitzroy Basin (Figure 9). The dominant land uses within the Callide Creek catchment are mining, forestry, power generation and agriculture (irrigated cropping, intensive livestock production and meat processing).

Callide Creek is a regionally significant watercourse located approximately 4 km south and 9 km west of the Callide Mine. The upper reaches of Callide Creek and its tributaries exhibit surface water flows that are highly ephemeral and short-duration, that are typically restricted to the wet season (i.e., November to March).

Callide Dam is located in the upper reaches of Callide Creek (Figure 9), forming the largest dam in the Callide Basin and has a full storage capacity of 136 Giga Litres (GL).

Downstream of Callide Dam, Callide Creek forms a braided river system comprising multiple channels spanning a broad alluvial floodplain (Figure 7). Periodic releases from Callide Dam maintain perennial surface water flow in the larger creek channels. Agricultural water supplies are abstracted from Callide Creek and the associated creek alluvium.



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Regional Catchment Setting

FIGURE 9

Figure 9: Regional Catchment Setting

2.4.2 Local Setting

The Callide Range forms local catchment boundaries. Local drainage in the vicinity of the Callide Mine includes Gate Creek, Oaky Creek, Dunn Creek and several tributaries, which are located on the western slopes of the Callide Range and drain west to the Callide Creek floodplain (Figure 7). The headwaters of Bell Creek form on the northern slopes of the range (Figure 7).

2.4.2.1 Dunn Creek

Drainage at Dunn Creek is generally north to south. Some minor catchments are truncated by the open-cut pit highwall, and creeks convey runoff around the eastern and western ends of the open-cut mining area (Figure 2). There are a number of mine water dams at the southern end of the MLs. The Dunn Creek mining area ultimately drains south via Dunn Creek and other tributary drainage lines into Callide Dam, approximately 1.5km south of the Dunn Creek MLs.

2.4.2.2 Trap Gully

Drainage at Trap Gully mining area is generally east to west. The main drainage line is Trap Gully (Figure 2). Oaky Creek drains through the northern part of the ML in an area not affected by mining. Trap Gully Creek joins Oaky Creek approximately 2 km downstream of Trap Gully, then flows into Callide Creek approximately 8km further downstream (Figure 2).

2.4.2.3 The Hut

Drainage at The Hut is generally east to west. The main drainage line is Oaky Creek that runs through the centre of the mining area (Figure 2). A permanent diversion of Oaky Creek, that is authorised under a Water Licence, diverts drainage around the northern end of the CVN Pit and its overburden emplacement area. Oaky Creek enters the Trap Gully mining area approximately 2 km downstream (Figure 2).

2.4.2.4 Boundary Hill

Drainage at Boundary Hill is generally north-east to south-west. The main drainage line is Campbell's Creek, which drains through the southern portion of the MLs between Boundary Hill North Pit and Boundary Hill South Pit overburden emplacement areas (Figure 2). Lake Gasteen is located on a tributary of Campbell's Creek at the western end of Boundary Hill North Pit. Campbell's Creek joins Gate Creek immediately downstream of the MLs (Figure 2). Gate Creek flows to the south-west and joins Callide Creek approximately 7 km downstream of the Boundary Hill MLs (Figure 7).

2.4.3 Water Licences

As part of the Callide mining operations, Batchfire holds a number of water licences under the *Water Act 2000* (Water Act) related to surface waters at Callide Mine. Water licences applicable to Callide Mine are summarised in Table 2.

Table 2: Water licences applicable to Callide Mine surface waters

Water Licence	Expiry Date	Authorised Purpose	Authorised Activity / Description
46187D	30/06/2111	Impounding Water	Interfere with the flow of water in Dunn Creek by impounding water on or adjoining land described as ML 80092 (Magazine Dam).
52703D	30/06/2111	Impounding Water	Interfere with the flow of water in Dunn Creek by impounding water on or adjoining land described as ML 80092 (Dunn Creek Dam).
105184	30/06/2111	Diverting the Flow of Water	Interfere with the flow of water in Oaky Creek by changing the course of flow on or adjoining land described as ML 5654 (Oaky Creek New Diversion).

A fourth Water Licence was repealed in 2021 by the Department of Regional Development, Manufacturing and Water (DRDMW). This licence previously authorised the 'Trap Gully Diversion' to interfere with the flow of water in an unnamed tributary of Oaky Creek. The unnamed tributary was deemed in 2021 to not be a watercourse under the Water Act, and the license was repealed. The repeal does not impact the ability of Callide Mine to continue to operate with the existing diversion infrastructure in place, as such, the Trap Gully Diversion remains *in situ.*

2.5 Groundwater

The Groundwater Report (Appendix D) presents the groundwater levels, groundwater quality and hydraulic properties of the key hydro-stratigraphic units.

Based on the available information, the local hydro-stratigraphy comprises of:

- Dry and unsaturated residual surface sediments and basalt that do not contribute significantly to the groundwater regime.
- The Biloela Formation aquitard that acts as a confining layer and restricts recharge to the underlying aquifer.
- A productive aquifer that includes the Precipice Sandstone and the uppermost sandstone deposit of the Callide Coal Measures. This is the main groundwater-bearing formation in the Callide Basin.
- Underlying aquitards including the remainder of the Callide Coal Measures and the underlying basement aquitard. The Callide Coal Measures includes water-bearing coal seams that yield limited volumes of groundwater and are not considered productive aquifers.

The groundwater regime is typically recharged by rainfall that occurs during the wet season. Seasonal runoff concentrates on the upper surfaces of the elevated landforms and along drainage lines, enhancing infiltration in these areas. A portion of the surface water infiltration moves through the

unsaturated rock profile to recharge the underlying groundwater table. Recharge is impeded by the overlying Biloela Formation aquitard, where present.

Groundwater flows south-west from the elevated groundwater recharge areas in the Callide Range towards the lower lying areas.

There is significant spatial variation in the groundwater table depth due to changes in topography. In general, the groundwater table is deeper in areas of elevated terrain and is shallower in lower lying areas and below incised creeks. In the elevated areas at the eastern margin of the basin, the groundwater table is typically located in the Callide Coal Measures at depths of up to approximately 100 m below ground level. In the lower lying areas in the south-west of the basin, the groundwater table is typically located in the Precipice Sandstone between approximately 10 m and 60 m below ground level. In general, the Precipice Sandstone and Callide Coal Measures are partially or fully saturated, where present.

In the vicinity of the open cut mining areas, groundwater levels and flow directions have been extensively modified. Where mining has intersected the groundwater table, active pit dewatering has depressurised the surrounding groundwater regime and lowered groundwater levels. This has created a zone of groundwater drawdown around the open cut pits. The observed groundwater drawdown effects are an expected outcome of the approved mining activities and will continue to develop over time as the approved mining activities progress.

The main groundwater discharge mechanism is active dewatering and evaporation from the open cut pits. Groundwater discharge also occurs regionally through evapotranspiration from woodland vegetation, where present.

Groundwater level data indicate that the groundwater table is typically located several metres below the bed of creeks within the vicinity of the mining areas. The separating depth between the creek beds and the groundwater table means that there is no direct interconnection between the groundwater table and surface waters in these areas. Groundwater does not provide baseflow to surface waters within the vicinity of Callide Mine.

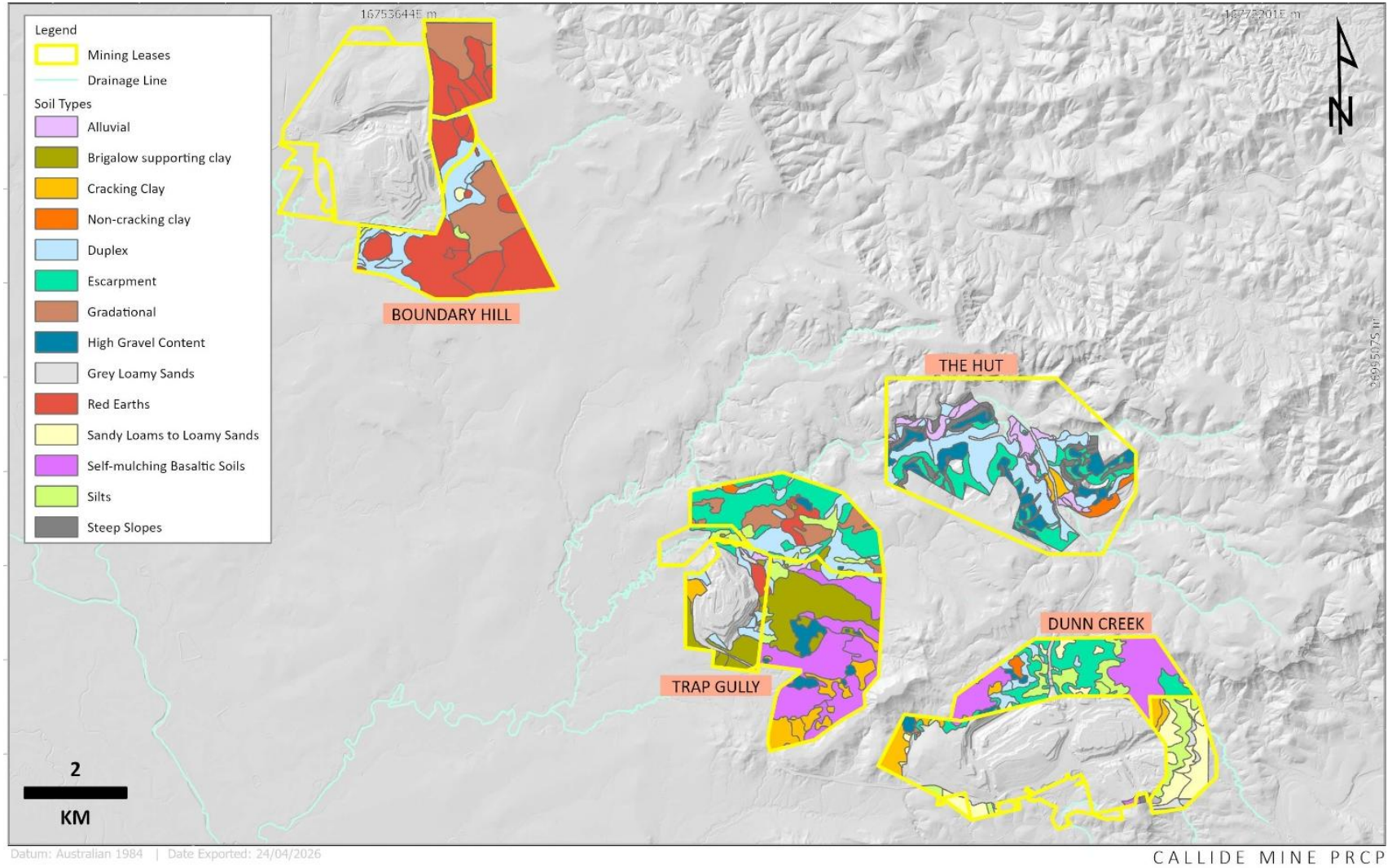
Groundwater quality in the Precipice Sandstone and Callide Coal Measures is typically pH neutral and non-saline to brackish, with low concentrations of metals, metalloids, and other solutes. Groundwater in the basement rock and Biloela Formation is distinctly more saline, with maximum Electrical Conductivity (EC) levels of up to approximately 40,000 µS/cm.

There are several groundwater supply bores located on four neighbouring properties and Batchfire has a Make Good Agreement (MGA) in place with all four properties. The MGAs include the requirement for Batchfire to monitor the groundwater level in the landholder's bores. In the event that any of the bores are adversely impacted as a result of the mining activities, the MGAs require Batchfire to make good with an equivalent alternative water supply. To date, the bores have not been adversely impacted.

2.6 Soil Types, Properties and Productivity

2.6.1 Soil Types and Properties

Assessments of soil and topsoil availability within each of the four mining areas have been conducted at varying levels of detail and progressively over the decades of operation, as part of numerous mine approvals that have been obtained for the current mining operations. Soil field surveys and desktop assessments indicate 14 soil types occur within the Callide Mine (SLR, 2022). Soil types are shown in Figure 10 and documented in Table 3, which also presents the approximate depth of topsoil that is available to be stripped and reused for each soil type.



BATCHFIRE CALLIDE

Soil Types
FIGURE 10

Figure 10: Soil types across the four mining areas

Table 3: Soil Types and depth of topsoil available for reuse

Soil Type	Australian Soil Classification	Approximate depth of topsoil available (m)
Alluvial soils	Dermosol	0.30 to 1.00
Self-mulching basaltic soils	Vertosol	0.10 to 0.45
Brigalow supporting clay soils	Vertosol	0.20 to 0.40
Cracking clays	Vertosol	0.10 to 0.50
Non-cracking clays	Dermosol	0.20 to 0.30
Duplex soils	Sodosols, Kurosols, Chromosols	0.15 to 0.35
Escarpment soils	Tenosols, Rudosols	0.10 to 0.15
Gradational soils	Dermosol, Kandosol	0.25 to 0.40
High gravel content soils	Tenosol, Rudosol	0.10 to 0.25
Grey loamy sands	Tenosol, Rudosol	0.20 to 0.35
Red earths	Dermosol, Kandosol	0.30 to 0.50
Sandy loam to loamy sands	Tenosol, Rudosol	0.15 to 0.45
Silts	Dermosol	0.10 to 0.30
Soils on steep slopes	Tenosol, Rudosol	0.00 to 0.25

Soils within the area have been classified according to the Australian Soil Classification (ASC) and grouped into broad Soil Management Groups (SMGs) for soil stripping, handling, and rehabilitation planning purposes. The SMGs consolidate similar soil types based on key physical and chemical characteristics that influence soil handling behaviour and rehabilitation suitability, such as texture, structure, fertility and water holding capacity (Table 4). Grouping soils in this manner provides a practical framework for managing soil resources during mining and supports their effective reuse in the establishment of stable and sustainable post-mining landforms.

Table 4: Callide Mine soil management groups and key considerations

Soil Type	ASC Order	Soil Types Included	Key Management Considerations
Cracking Clays	Vertosols	Self-mulching basaltic soils; Brigalow supporting clay soils; Cracking clays	High fertility and moisture-holding capacity. Often suitable as high-quality topsoil. Handle when dry to avoid compaction and structural damage.
Structured and Gradational Soils	Dermosols; Kandosols	Alluvial soils; Non-cracking clays; Gradational soils; Red earths; Silts	Moderate fertility and good structure. Suitable for use as topsoil or subsoil in rehabilitation profiles. Maintain structure during stripping and respreading.
Texture Contrast (Duplex) Soils	Sodosols; Chromosols; Kurosols	Duplex soils	Abrupt texture change between horizons. Subsoils may be sodic or dispersive. Topsoil should be stripped separately where practicable to maintain productivity.
Sandy and Skeletal Soils	Tenosols; Rudosols	Escarpment soils; High gravel content soils; Grey loamy sands; Sandy loam to loamy sands; Soils on steep slopes	Low fertility and water-holding capacity. Often shallow or stony. Typically used as growth media where better-quality soils are unavailable or as part of reconstructed soil profiles.

2.6.2 Land Capability

Land capability describes the inherent ability of land to support a range of agricultural uses without causing long-term land degradation and is generally expressed as Classes I to VIII (Table 5). Land suitability, in contrast, assesses the appropriateness of land for a specific use by comparing land characteristics with the requirements of that land use.

Table 5: Land capability classes

Land Capability Class	Description
Class I	Land suitable for all agricultural and pastoral uses
Class II	Land suitable for all agricultural uses but with slight restrictions for cultivation.
Class III	Land suitable for all agricultural uses but with moderate restrictions for cultivation.
Class IV	Land primarily suited to pastoral use but which may be safely used for occasional cultivation with careful management.

Land Capability Class	Description
Class V	Land that in all other characteristics would be arable but has limitations that make cultivation impractical and/or uneconomic.
Class VI	Land that is not suitable for cultivation but is well suited to pastoral use.
Class VII	Land that is not suitable for cultivation but on which pastoral use is possible only with careful management.
Class VIII	Land that has such severe limitations that it is unsuited for either cultivation or grazing.

Several baseline land capability assessments have been conducted for the different mining areas at Callide Mine. Land capability of the Dunn Creek Mining area was estimated by Emmerton, with it being assessed as Class VIII, due primarily to the steep rocky slopes with skeletal soils, which are nutritionally and physically poor. These soils are also prone to compaction and surface sealing (Anglo Coal, EMOS, 2004).

The land capability study of the Trap Gully Mining area found that although soils in the Trap Gully area are also nutritionally and physically poor, gentler slope gradients give rise to a higher percentage of land being suitable for agricultural use. Approximately 42% of the total Trap Gully area was assessed as being Class VIII, approximately 30% class VII, 18% as class 6 and 10% as Class IV.

Most of The Hut mining area consists of skeletal sandy soils on steep rocky slopes. These areas have been assessed as Class VIII (69%) with the remainder as Class VII.

At Boundary Hill, a 1992 review by Emmerton of land capability on unmined land concluded that most areas fell into Classes VI and VII (Anglo Coal (Callide Management), 2003).

2.6.3 Land Stability

There is no known pre-existing land degradation or major erosion within the Callide Mine MLs that would contribute to ongoing stability issues. Non mined land adjacent to the Callide Mine and within the Callide Basin indicates surface erosion is common upon disturbance of soils and vegetation from grazing and other land uses.

2.6.4 Contaminated Land

Mining operations at Callide Mine commenced in 1944, prior to the introduction of modern environmental legislation and regulatory standards. As a result, pre-mining baseline contaminated land data and historical records relating to environmental incidents or management practices from the early mining operations are not available.

Operations at Callide Mine since the commencement of mining/exploration have included heavy industrial type activities and supporting infrastructure including:

- Drilling/exploration
- Extraction and processing of coal
- Chemical storage and formulation
- Waste storage for collection and disposal offsite

- Sewage treatment
- Operation of a variety of plant/equipment workshops and scrap yards
- Petroleum product storage and dispensing
- Explosive production, storage and use

The nature of these types of operations, which include the storage, handling, use and disposal of hazardous materials, have the potential to result in the contamination of land. As such, there are seven (7) properties at Callide Mine included on the Environmental Management Register (EMR).

Certain Lot Plans overlap mining tenure to a limited extent; therefore, a Notifiable Activity (NA) has not been undertaken within areas of mining tenure. The registered properties and their associated NA are listed below. Where an NA has not been undertaken on mining tenure held by Callide Mine, this is denoted by an asterisk (*).

Dunn Creek:

- Lot 100 on SP301602: Engine reconditioning works, and Petroleum product or oil storage
- Lot 23 on SP129150: Petroleum product or oil storage, and Operating a coal fired power station*

Trap Gully:

- Lot 31 on RP899131: Landfill – disposing of waste (excluding inert construction and demolition waste)*
- Lot 4 on SP328354: Landfill – disposing of waste (excluding inert construction and demolition waste)*

The Hut:

- Lot170 on FTY1843: Gun, pistol or rifle range (operating a gun, pistol or rifle range)*, and Livestock Dip or spray race (operating a livestock dip or spray race facility)*

Boundary Hill:

- Lot153 on RN1431: Abrasive blasting, Engine reconditioning works, and Petroleum product or oil storage, and Petroleum product or oil storage
- Lot11 on RP801163: Mine wastes

None of the identified properties are listed on the Contaminated Land Register. Current management of waste and contaminated land is in accordance with the EP Act and the conditions in the Callide Mine EA that require the reporting of releases of hazardous contaminants and periodic monitoring of groundwater. The EA has provision for the onsite disposal of scrap tyres resulting from the mining activities, and the release of effluent from the sewage treatment plants at Dunn Creek and Boundary Hill. Based on the long-term operation of heavy industrial activities and waste disposal at the site, it is expected that management of contaminated land will be required following the cessation of mining operations.

Prior to surrender of each Rehabilitation Area that has been subject to industrial activity, a contaminated land assessment will be undertaken, where required, to confirm the land is suitable for the nominated PMLU and does not pose unacceptable risk to human health or the environment.

2.7 Vegetation communities and Ecological values

The Callide Coal mine is located in the Callide Creek Downs subregion of the Brigalow Belt South Bioregion. This bioregion stretches from southern QLD to northern NSW, covering approximately 27.2 million hectares.

Land clearing for cattle grazing in the region has been extensive, and the Callide Mine contains areas that are currently grazed or have been historically. Before the commencement of mining activities, land within the Callide Mine MLs was primarily used for low-intensity cattle grazing on native or improved pastures at Dunn Creek, Trap Gully, The Hut, and Boundary Hill. In addition, selective logging occurred at Dunn Creek, Trap Gully, and The Hut within areas of the Callide Timber Reserve.

2.8 Regional Ecosystems and Habitat values

Regional Ecosystem (RE) mapping within the Mining Leases identifies 22 REs comprising remnant and regrowth vegetation (Figure 11 to 14). These include Endangered, Of Concern and Least Concern REs under the Vegetation Management Act 1999.

The VM Act status REs present within the Callide Mine MLs are listed in Table 6, along with the corresponding vegetation management and biodiversity status and the approximate area of remnant and high-value regrowth.

Table 6: Regional Ecosystems mapped within Callide Mine Mining Leases (ML)

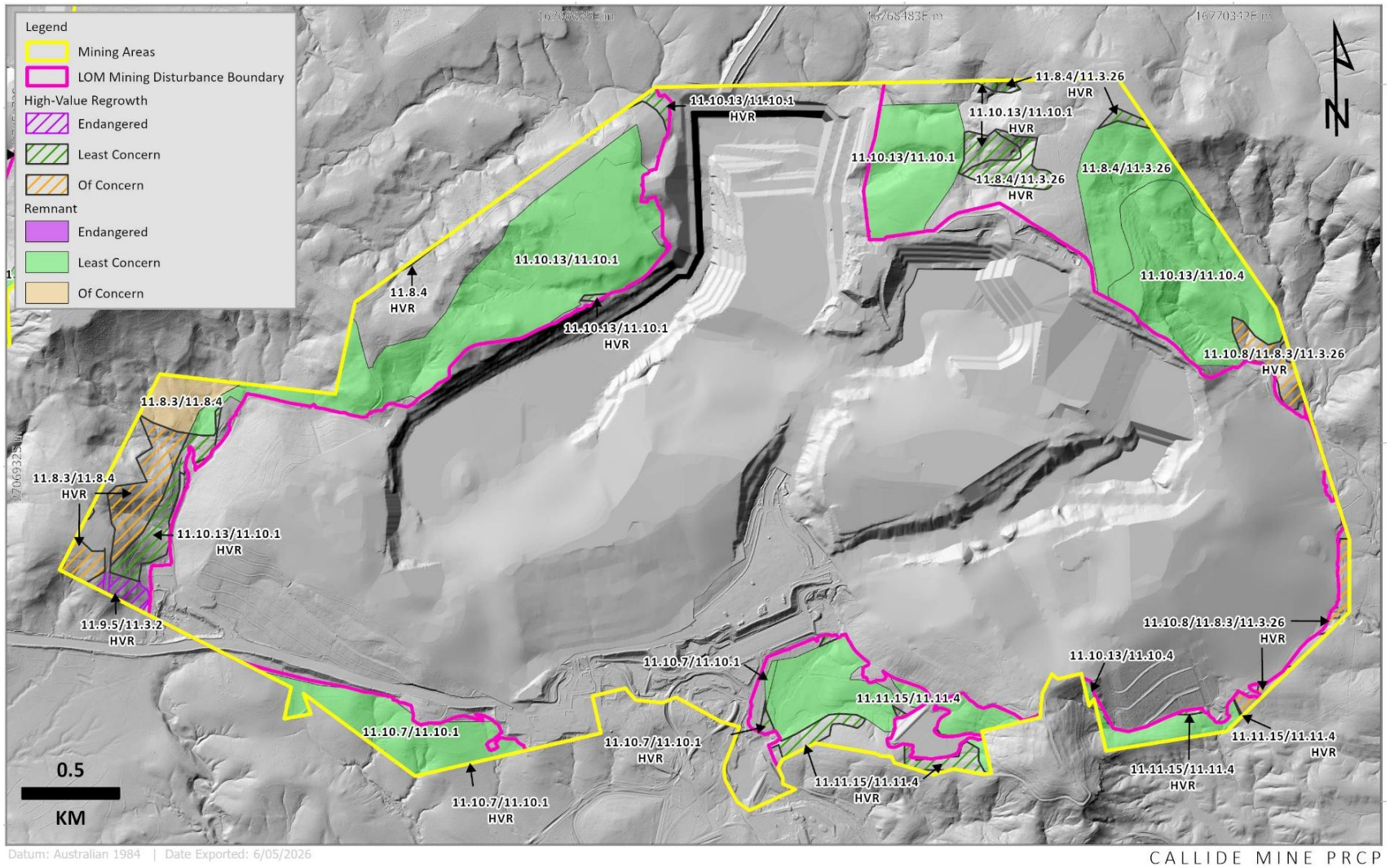
Regional Ecosystem (RE)	RE Description	VM Act Status	Biodiversity Status	Approximate Area (ha)	
				High Value Regrowth (ha)	Remnant (ha)
MINING AREA: DUNN CREEK				**66**	**288**
11.3.2	*Eucalyptus populnea* woodland on alluvial plains	Of concern	Of concern	1	-
11.3.26	*Eucalyptus moluccana* or *E. microcarpa* woodland to open forest on margins of alluvial plains	Least concern	No concern at present	2	1
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks	Of concern	Of concern	17	8
11.8.4	*Eucalyptus melanophloia* woodland to open woodland on Cainozoic igneous rocks.	Least concern	No concern at present	9	24
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks	Endangered	Endangered	2	-
11.10.1	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	1	10

Regional Ecosystem (RE)	RE Description	VM Act Status	Biodiversity Status	Approximate Area (ha)	
				High Value Regrowth (ha)	Remnant (ha)
11.10.4	*Eucalyptus decorticans, Lysicarpus angustifolius +/- Eucalyptus spp., Corymbia spp., Acacia spp.* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	-	8
11.10.7	*Eucalyptus crebra* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	1	23
11.10.8	Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks	Of concern	Of concern	7	-
11.10.13	*Eucalyptus spp*. and/or *Corymbia spp*. open forest on scarps and sandstone tablelands	Least concern	No concern at present	18	176
11.11.4	*Eucalyptus crebra* woodland on old sedimentary rocks with varying degrees of metamorphism and folding. Coastal ranges	Least concern	No concern at present	1	4
11.11.15	*Eucalyptus crebra* woodland to open woodland on deformed and metamorphosed sediments and interbedded volcanics	Least concern	No concern at present	8	34
MINING AREA: TRAP GULLY				**60**	**211**
11.3.2	*Eucalyptus populnea* woodland on alluvial plains	Of concern	Of concern	<1	-
11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	Least concern	Of concern	-	12
11.3.26	*Eucalyptus moluccana* or E. *microcarpa* woodland to open forest on margins of alluvial plains	Least concern	No concern at present	4	-
11.3.4	*Eucalyptus tereticornis* and/or *Eucalyptus spp.* woodland on alluvial plains	Of concern	Of concern	-	34
11.3.6	*Eucalyptus melanophloia* woodland on alluvial plains	Least concern	Of concern	-	2

Regional Ecosystem (RE)	RE Description	VM Act Status	Biodiversity Status	Approximate Area (ha)	
				High Value Regrowth (ha)	Remnant (ha)
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks	Of concern	Of concern	6	-
11.8.4	*Eucalyptus melanophloia* woodland to open woodland on Cainozoic igneous rocks.	Least concern	No concern at present	29	8
11.9.1	*Acacia harpophylla-Eucalyptus cambageana* woodland to open forest on fine-grained sedimentary rocks	Endangered	Endangered	1	-
11.9.2	*Eucalyptus melanophloia +/- E. orgadophila* woodland to open woodland on fine-grained sedimentary rocks	Least concern	No concern at present	2	-
11.9.5	*Acacia harpophylla and/or Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks	Endangered	Endangered	2	-
11.10.1	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	13	-
11.10.4	*Eucalyptus decorticans, Lysicarpus angustifolius +/- Eucalyptus spp., Corymbia spp., Acacia spp.* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	-	7
11.10.13	*Eucalyptus spp. and/or Corymbia spp.* open forest on scarps and sandstone tablelands	Least concern	No concern at present	1	147
MINING AREA: THE HUT				**53**	**471**
11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	Least concern	Of Concern	9	1
11.3.26	*Eucalyptus moluccana* or *E. microcarpa* woodland to open forest on margins of alluvial plains	Least concern	No concern at present	-	3
11.3.4	*Eucalyptus tereticornis* and/or *Eucalyptus spp*. woodland on alluvial plains	Of concern	Of concern	25	3

Regional Ecosystem (RE)	RE Description	VM Act Status	Biodiversity Status	Approximate Area (ha)	
				High Value Regrowth (ha)	Remnant (ha)
11.3.6	*Eucalyptus melanophloia* woodland on alluvial plains	Least concern	Of concern	2	-
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks	Of concern	Of concern	3	-
11.8.4	*Eucalyptus melanoph*loia woodland to open woodland on Cainozoic igneous rocks.	Least concern	No concern at present	2	-
11.10.1	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	1	33
11.10.4	*Eucalyptus decorticans, Lysicarpus angustifolius +/- Eucalyptus spp., Corymbia spp., Acacia spp.* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	-	15
11.10.13	*Eucalyptus spp*. and/or *Corymbia spp.* open forest on scarps and sandstone tablelands	Least concern	No concern at present	11	416
MINING AREA: BOUNDARY HILL				**123**	**164**
11.3.1	*Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains	Endangered	Endangered	<1	-
11.3.11	Semi-evergreen vine thicket on alluvial plains	Endangered	Endangered	<1	-
11.3.2	*Eucalyptus populnea* woodland on alluvial plains	Of concern	Of Concern	<1	-
11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	Least concern	Of Concern	-	3
11.3.4	*Eucalyptus tereticornis* and/or *Eucalyptus spp*. woodland on alluvial plains	Of concern	Of Concern	<1	-
11.8.4	*Eucalyptus melanophloia* woodland to open woodland on Cainozoic igneous rocks.	Least concern	No concern at present	-	7
11.9.1	*Acacia harpophylla-Eucalyptus cambageana* woodland to open	Endangered	Endangered	-	2

Regional Ecosystem (RE)	RE Description	VM Act Status	Biodiversity Status	Approximate Area (ha)	
				High Value Regrowth (ha)	Remnant (ha)
	forest on fine-grained sedimentary rocks				
11.9.4a	Semi-evergreen vine thicket, generally dominated by a low tree layer, on fine-grained sedimentary rocks	Of concern	Endangered	2	16
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks	Endangered	Endangered	1	6
11.9.9	*Eucalyptus crebra* woodland on fine-grained sedimentary rocks	Least concern	No concern at present	13	21
11.9.13	*Eucalyptus moluccana* or *E. microcarpa* open forest on fine grained sedimentary rocks	Of concern	Of concern	6	20
11.10.1	*Corymbia citriodora* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	76	89
11.10.7	*Eucalyptus crebra* woodland on coarse-grained sedimentary rocks	Least concern	No concern at present	11	-
11.11.4	*Eucalyptus crebra* woodland on old sedimentary rocks with varying degrees of metamorphism and folding. Coastal ranges	Least concern	No concern at present	8	-
11.11.15	*Eucalyptus crebra* woodland to open woodland on deformed and metamorphosed sediments and interbedded volcanics	Least concern	No concern at present	5	-



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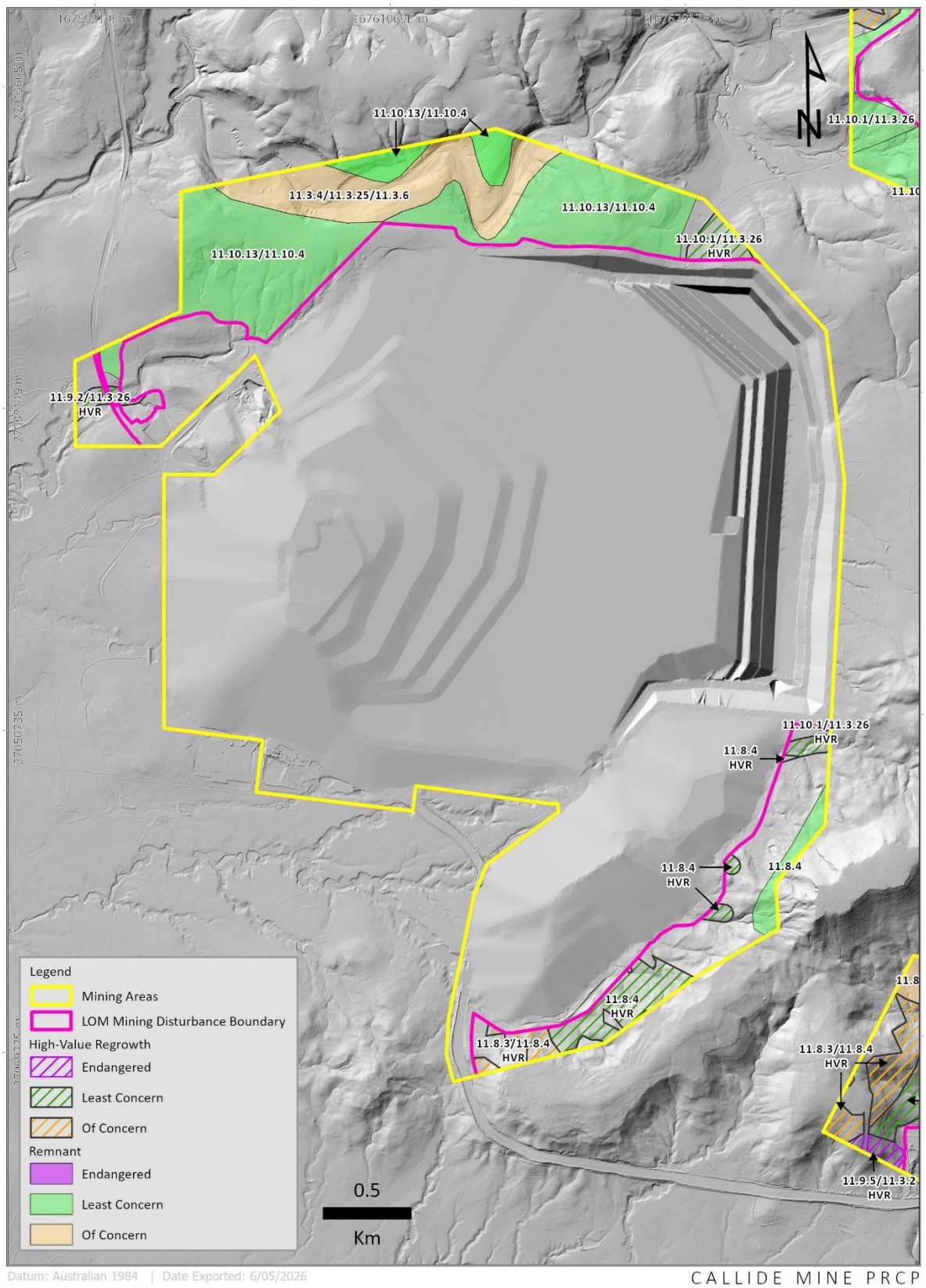
Dunn Creek - Vegetation Management Act Status RE Mapping

FIGURE 11

Figure 11: Dunn Creek Mining Area Vegetation Management Act Status RE Mapping

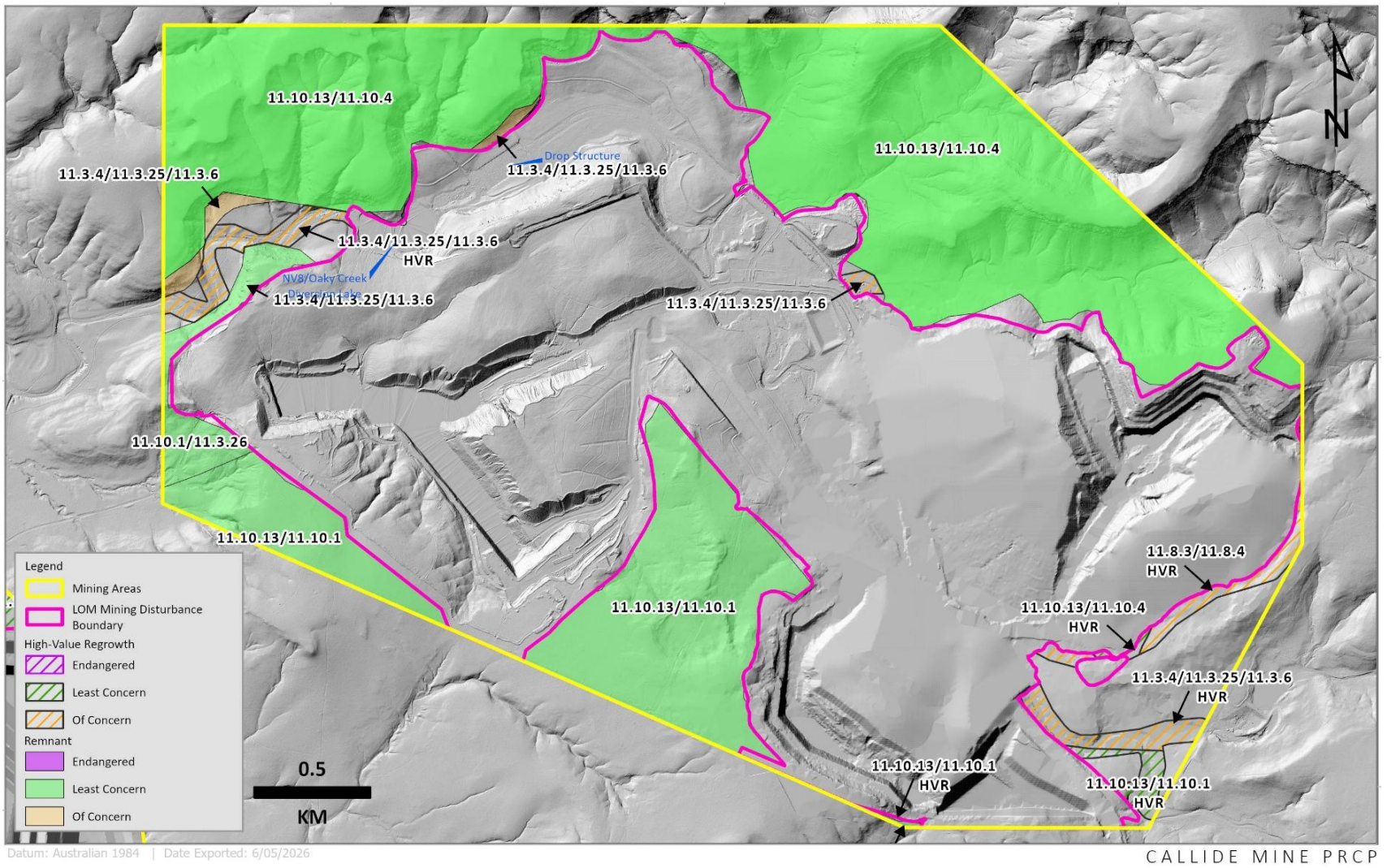


BATCHFIRE CALLIDE

Trap Gully - Vegetation Management Act Status RE Mapping

FIGURE 29

Figure 12: Trap Gully Mining Area Vegetation Management Act Status RE Mapping



BATCHFIRE CALLIDE

The Hut - Vegetation Management Act Status RE Mapping

FIGURE 13

Figure 13: The Hut Mining Area Vegetation Management Act Status RE Mapping

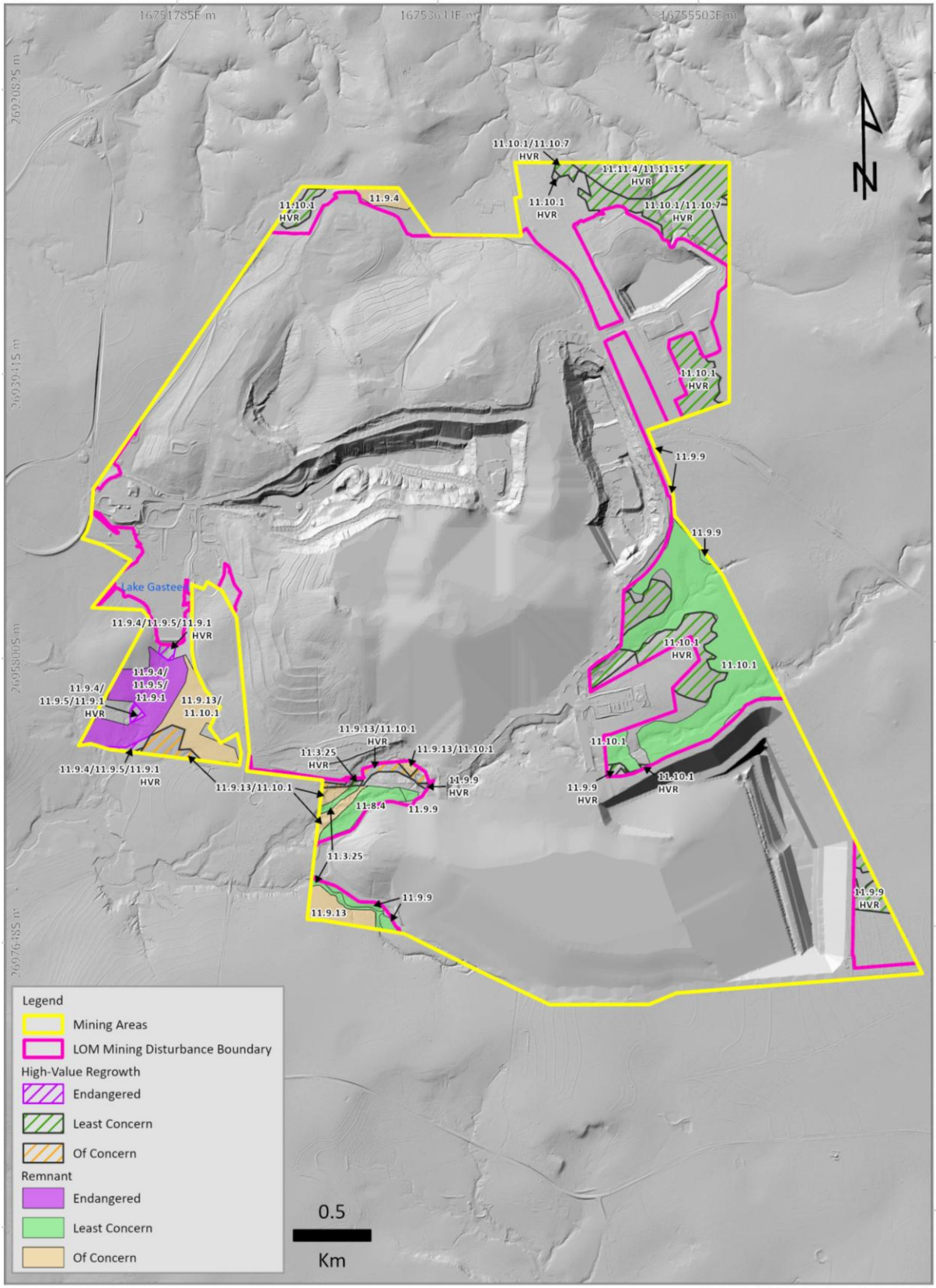


Figure 14: Boundary Hill Mining Area Vegetation Management Act Status RE Mapping

2.9 Fauna Presence and Populations

2.9.1 Threatened Species

Targeted surveys have identified species of conservation significance within or adjacent to the site.

A number of fauna surveys have been conducted across the Callide Mine MLs and surrounding areas for various approvals obtained over the life of the mine. These fauna surveys were conducted in consideration of the relevant QLD and Commonwealth survey guidelines. No endangered fauna species have been observed within the Callide Mine MLs during these surveys.

The following species of conservation significance have been observed within the Callide Mine MLs:

- Squatter Pigeon (Southern) (*Geophaps scripta scripta*) listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and the *Nature Conservation Act 1992* (Qld) (NC Act); and
- Short-beaked Echidna (*Tachyglossus aculeatus*) listed as Special Least Concern under the NC Act.

Three species of conservation significance have been assessed as having a moderate or high likelihood of occurring with the Callide Mine MLs:

- The Greater Glider (Central) (*Petauroides armillatus*) listed as Endangered under the EPBC Act and the NC Act;
- The White-throated Needletail (*Hirundapus caudacutus*) listed as Vulnerable under the NC Act; and
- The Koala (*Phascolarctos cinereus*) listed as Endangered under the EPBC Act and the NC Act.

Squatter Pigeon have been detected on Callide Mine MLs during previous ecological surveys (Anglo 2014). Squatter Pigeon are ground-dwelling birds, predominantly foraging on seeds from grasses and tend to inhabit the grassy understorey of eucalypt woodlands and open grass areas (TSSC 2015). Squatter Pigeons require access to permanent water for drinking, either natural or man-made, with cattle drinking troughs providing a year-round supply of water (Anglo, 2014). Squatter Pigeon habitat has been mapped within the Callide mine in association with remnant and regrowth eucalypt dominated REs within 1km of suitable water sources, including larger watercourses and waterbodies that hold pools of water for extended periods.

Short-beaked echidna have been recorded on Callide Mine previous ecological surveys (Anglo, 2014). This species occurs in a wide range of habitats and is likely to occupy remnant and regrowth habitats within the site.

The bushland PMLU has been designed to provide habitat attributes consistent with eucalypt woodland, which is suitable for the above two fauna species. This includes habitat for both ground-dwelling woodland birds and terrestrial foraging mammals, consistent with pre-mining land use and adjacent remnant vegetation.

The habitat attributes provided by the Squatter Pigeon within the bushland PMLU include:

- Open eucalypt woodland structure with sparse shrub layer;
- Native grass-dominated ground layer suitable for foraging;

- Low levels of ground disturbance post-rehabilitation; and
- Connectivity with adjacent remnant woodland and grassland habitats.

Furthermore, the short-beaked echidna is provided for with:

- Native woodland and grassland vegetation;
- Leaf litter and organic matter supporting invertebrate prey;
- Coarse woody debris and rock features for shelter; and
- Stable landforms with suitable soil profiles for foraging.

2.10 Exploration Activities

In preparation for, and to support, ongoing mining operations, exploration and other minor ancillary activities will be conducted ahead of mining, throughout the life of the operation. These disturbances will not be included as part of the life of mine plan and, as such, do not feature in any of the plans attached to this report. These may include:

- access tracks, minor roads and culverts;
- services, pipelines, powerlines, sub-station pads and associated power infrastructure;
- monitoring pads, environmental infrastructure and bores; and
- exploration drill pads, lines and associated tracks.

The majority of the disturbance created by exploration will be within rehabilitation areas, although some may occur outside in areas nominated as non-disturbed. These disturbances will be rehabilitated in accordance with the *Eligibility criteria and standard conditions for exploration and mineral development projects* (DEHP, 2016 or successor) and must be rehabilitated to a stable condition compatible with the surrounding Bushland PMLU.

2.11 Underlying Landholders

2.11.1 Tenements

As described in Section 2.1.4, a total of 19 Mining Leases exist within the Callide Mine, all of which are held by Batchfire Resources Pty Ltd.

2.11.2 Landholders

Land ownership within the Callide Mine is detailed in Figure 15a and 15b. The majority of the underlying land parcels are either freehold land owned by Batchfire or land within the Callide Timber Reserve, owned by the Queensland Government. Figure 15a displays the land parcels underlying the MLs and indicates those that are not owned by Batchfire, including:

- Areas of the Timber Reserve at Dunn Creek, Trap Gully and The Hut, owned by The State of Queensland (DETSI);
- Land leased to Aurizon Network Pty Ltd for areas associated with the rail infrastructure at the southern end of Dunn Creek; and
- Small areas of freehold land at Dunn Creek owned by Craig E Polsen.

There are several easements within the Callide Mine (Figure 15) associated with the following third-party infrastructure:

- Two parallel powerlines running between Boundary Hill North Pit and Boundary Hill East Pit; and
- A high voltage electrical substation and associated powerline at Dunn Creek.

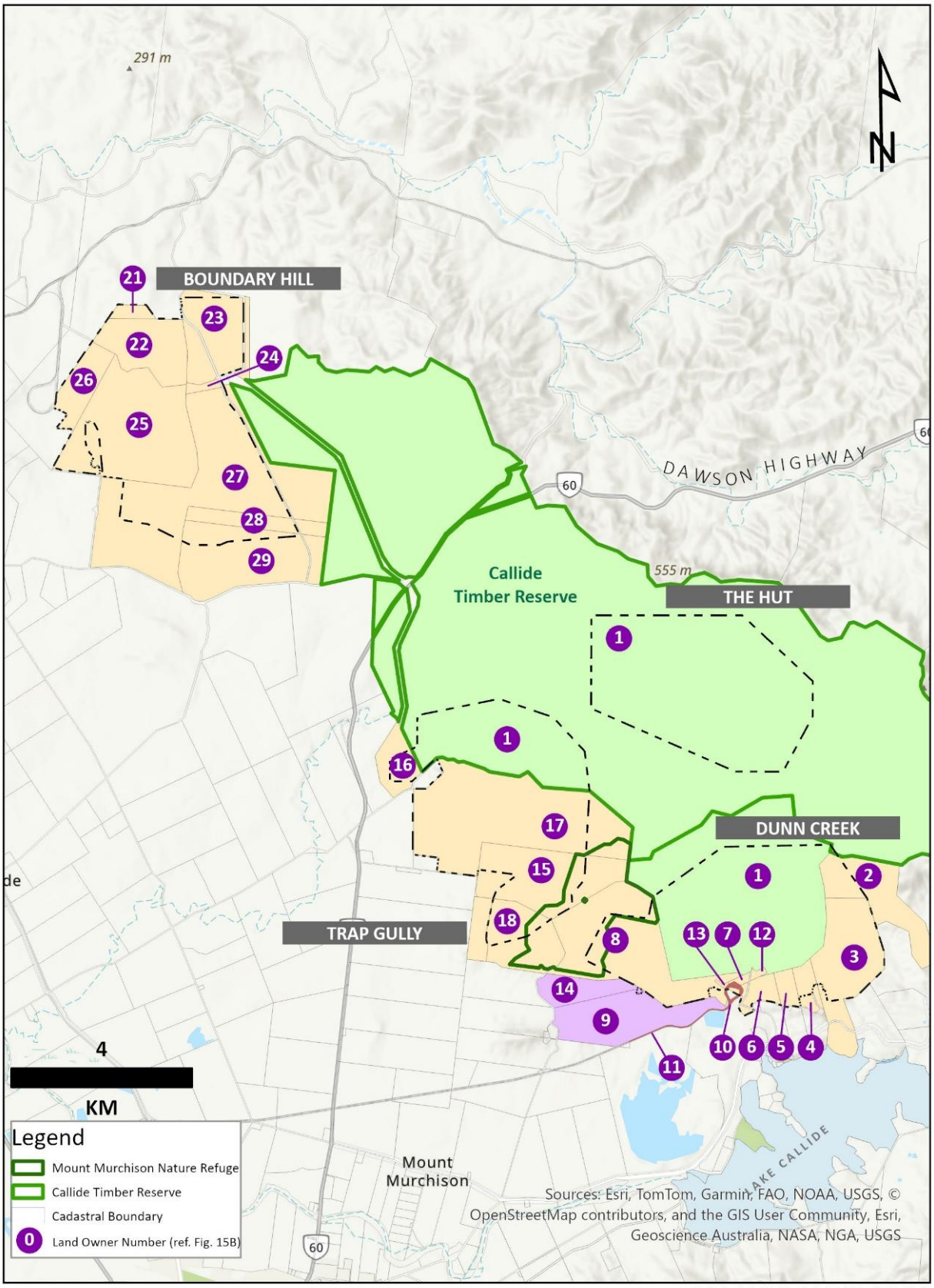


Figure 15: Land Ownership plan

NO.	LOT AND PLAN	REGISTERED PROPRIETOR
Dunn Creek		
1	Lot 170 Plan 1843	The State of Queensland (DETSI)
2	Lot 10 Plan RP912765	Batchfire Callide Pty Ltd
3	Lot 6 Plan RP848846	Batchfire Callide Pty Ltd
4	Lot 13 Plan RP848909	Batchfire Callide Pty Ltd
5	Lot 12 Plan RP848908	Batchfire Callide Pty Ltd
6	Lot 23 Plan SP129150	Batchfire Callide Pty Ltd
7	Lot 16 Plan SP120478	Batchfire Callide Pty Ltd
8	Lot 100 Plan SP301602	Batchfire Callide Pty Ltd
9	Lot 101 Plan SP301602	Craig E Polsen
10	Lot 421 Plan RN1357	Aurizon Network Pty Ltd
11	Lot 15 Plan 120478	Aurizon Network Pty Ltd
12	Lot 17 Plan SP120478	Batchfire Callide Pty Ltd
13	Lot 31 Plan RN869	Batchfire Callide Pty Ltd
14	Lot 52 Plan RP843058	Craig E Polsen
Trap Gully		
1	Lot 170 Plan FTY1843	The State of Queensland (DETSI)
15	Lot 7 Plan RN1519	Batchfire Callide Pty Ltd
16	Lot 152 Plan RN1429	Batchfire Callide Pty Ltd
17	Lot 4 Plan SP328354	Batchfire Callide Pty Ltd
18	Lot 10 Plan SP307514	Batchfire Callide Pty Ltd
The Hut		
1	Lot 170 Plan FTY1843	The State of Queensland (DETSI)
Boundary Hill		
21	Lot 38 Plan RP801409	Batchfire Callide Pty Ltd
22	Lot 1 Plan SP200831	Batchfire Callide Pty Ltd
23	Lot 3 Plan SP216326	Batchfire Callide Pty Ltd
24	Lot 2 Plan SP231268	Batchfire Callide Pty Ltd
25	Lot 153 Plan RN1431	Batchfire Callide Pty Ltd
26	Lot 11 Plan RP801163	Batchfire Callide Pty Ltd
27	Lot 1 Plan SP301592	Batchfire Callide Pty Ltd
28	Lot 134 Plan SP301592	Batchfire Callide Pty Ltd
29	Lot 94 Plan SP301592	Batchfire Callide Pty Ltd

BATCHFIRE CALLIDE

CALLIDE MINE PRCP

LAND OWNERSHIP TABLE

FIGURE 15B

2.12 Design for Closure

As an existing operation transitioning to the PRCP framework, detailed redesign of previously approved disturbance is not required. However, rehabilitation will be undertaken in a manner that achieves stable, non-polluting landforms compatible with the nominated PMLUs.

2.13 Rehabilitation and Improvement Planning

2.13.1 Relevant activities requiring rehabilitation

The relevant activities and Batchfire-owned infrastructure at Callide Mine that will require rehabilitation, and the predicted duration and availability for progressive rehabilitation are provided in Table 7. Any infrastructure that is beneficial to the PMLU may be retained at closure and will not be available for rehabilitation.

Table 7: Relevant activities requiring rehabilitation at Callide Mine

Relevant Activity	Predicted Duration	Availability for progressive rehabilitation
Overburden Emplacement Areas (Spoil dumps)	Dumping to overburden emplacement areas will continue in active pits until the end of mining in 2047	• Progressive rehabilitation has commenced • Available for progressive rehabilitation as dump areas reach final position and are no longer required for associated infrastructure or required for access
Mine Infrastructure Areas	Varying: with the latest utilised until the end of rehabilitation activities	• Dependent on the use and location, the majority will be available for rehabilitation at the end of the major rehabilitation activities; some areas may be available earlier, such as at the end of mining
Mine dams	Varying: with the latest utilised until the end of rehabilitation activities	• Available for rehabilitation when no longer required for water management
Exploration	Throughout the operational life	• Available for rehabilitation once exploration activities are complete
Creek Diversions and crossings	Varying: with the latest utilised until the end of rehabilitation activities	• Dependent on the location to mining and closure activities; typically crossings will be available for rehabilitation at the end of the major rehabilitation activities, some may be available earlier, such as at the end of mining
Final Voids and Ramps	Utilised for mining or water storage until the end of mining	• All voids not currently being mined are utilised for water storage as part of the Callide mine water network

2.13.2 Rehabilitation Areas

The Rehabilitation areas (RA) included in the PRCP schedule for Callide Mine are referred to throughout this PRCP. A RA is defined in the PRCP Guideline "*as an area of land in the post-mine land use to which a rehabilitation milestone for the post-mining use relates*". The mining activity domains (relevant activity) corresponding to the rehabilitation areas (RAs) described in Section 10.1, are summarised in Table 8 below.

As required in the PRCP guideline, only PMLU areas where disturbance has occurred or will occur, are mapped as a RA. Undisturbed creek areas, such as within Boundary Hill South ML80186 are expected to remain undisturbed as part of this transitional PRCP, and therefore not mapped as a RA.

To support ongoing operations, exploration and minor ancillary activities may be required in areas not mapped as a RA. Minor ancillary activities, detailed in Section 2.10, can occur without a PRCP amendment.

Table 8: Rehabilitation areas and relevant activities for Callide Mine

Rehabilitation Area	Post Mining Land Use	Relevant Activity
RA1	Bushland	Overburden Emplacement Area - Existing Rehabilitation - Pre 1998
RA2	Bushland	Overburden Emplacement Area - Existing Rehabilitation - Post 1998
RA3	Bushland	Overburden Emplacement Area
RA4	Bushland	Mine Infrastructure Area Roads Laydown areas General infrastructure and disturbance
RA5	Grazing	Mine Infrastructure Area Roads Laydown areas General infrastructure and disturbance
RA6	Watercourse (engineered diversion)	Creek Diversions Watercourse crossings

2.13.3 Rehabilitation Milestones

The Rehabilitation Milestones (RM) included in the PRCP schedule for Callide mine are referred to throughout this PRCP (Table 9). A RM is defined in the PRCP Guideline as "*each significant event or step necessary to rehabilitate the land to a stable condition (section 112 of the EP Act)*".

Rehabilitation milestones are structured to provide measurable, outcome-based criteria aligned with achieving a stable condition. Milestone criteria will be quantitative where practicable (e.g., vegetation cover %, slope angles, erosion class) and capable of objective verification.

Table 9: Rehabilitation milestones for Callide Mine

Milestone Reference	Milestone name
RM1	Infrastructure Decommissioning and Removal
RM2	Identification, remediation and removal of contaminated land
RM3	Landform Development and Reshaping/Reprofiling
RM4	Surface Preparation
RM5	Revegetation
RM6	Achievement of Surface Requirements (Bushland)
RM7	Achievement of Surface Requirements (Grazing)
RM8	Achievement of Surface Requirements (Watercourse (Engineered Diversion))
RM9	Achievement of Bushland PMLU to a Stable Condition
RM10	Achievement of Grazing PMLU to a Stable Condition
RM11	Achievement of Watercourse (Engineered Diversion) PMLU to a Stable Condition
RM12	Retained infrastructure

2.13.4 Improvement Areas and Milestones

The Improvement Areas (IA) and Management Milestones (MM) included in the PRCP schedule for Callide Mine are referred to throughout this PRCP.

An IA is defined in the PRCP Guideline as an "*area of land in the NUMA to which a management milestone for the NUMA relates*" and a MM is "*each significant event or step necessary to achieve best practice management of the area and to minimise risks to the environment (section 112 of the EP Act)*".

The Callide Mine IAs and associated relevant activities are detailed in Table 10 and the MMs are detailed in Table 11.

Table 10: Improvement areas and relevant activities for Callide Mine

IA	NUMA	Relevant activity
IA1	NUMA	Final Voids and Ramps

Table 11: Management milestones for Callide Mine

MM	MM name
MM1	Achievement of final landform design
MM2	Achievement of safety requirements
MM3	Achievement of sufficient improvement

2.13.5 Rehabilitation Undertaken to Date

In accordance with Section 126C (1) (j) of the EP Act, transitional PRCPs must also include the following details about any existing rehabilitation already completed at the time of submission of the proposed PRCP:

- A description of the rehabilitation works previously carried out;
- When the rehabilitation works commenced and were completed; and
- Whether the rehabilitation has been applied for or approved as progressively certified under the EP Act.

Progressive rehabilitation has been undertaken across multiple mining areas since 1981. (Plate 1 and Plate 2).

Plate 1: Progressive rehabilitation at the Hut during Yr 2022

Plate 2: Recently established rehabilitation (Yr 2023) in foreground with established (Yr 2000 to 2005) rehabilitation in background.

2.13.5.1 Existing Rehabilitation Methodology

Batchfire uses conventional rehabilitation methods for the rehabilitation of overburden emplacement areas at Callide Mine (Batchfire Resources, 2023). The following rehabilitation activities have been undertaken during most previous rehabilitation programs:

- Reshaping of spoil
- Spreading of topsoil (to an average depth of 150-200 mm)
- Construction of drainage structures
- Rock mulching where required on steeper slopes (as authorised in Environmental Authority - Table H2)
- Seeding with a mix comprised of locally occurring tree and shrub species, and native and non-native grass species

Changes in rehabilitation methods occurred in 1998/1999 including:

- Introduction of deep ripping in 1998 (0.5 to 0.8 m)
- Elimination of pasture grasses from the seed mix in 1999
- Inclusion of a wider range of native tree species to the seed mix in 1998.
- Graded banks constructed with a trapezoidal cross-section with an invert width equivalent to the width of the dozer constructing the contour bank, typically a D8N.

These changes in the rehabilitation methods were reflected in an update to the Completion Criteria in 2003 through 'The Report on Rehabilitation Acceptance (Completion) Criteria' completed by Anglo Coal.

2.13.5.2 Existing Rehabilitation Areas

As of December 2025, approximately 804 ha has been rehabilitated (Figure 16), primarily comprising overburden emplacement areas, with Table 12 providing the approximate rehabilitated areas within each mining area by year of completion (i.e. seeding). All rehabilitation completed as described targets the Bushland PMLU. There have been no rehabilitation areas completed to meet the Grazing PMLU, as land availability to date has been for Bushland PMLU only. The PRCP schedule includes this 804 ha of Bushland PMLU.

Table 12: Existing Rehabilitation Areas by Year of Completion

Year Completed	Mining Area (Ha)				TOTAL (Ha)
	Dunn Creek	Trap Gully	The Hut	Boundary Hill	
1981	9	-	-	-	9
1985	-	-	-	55	55
1991	-	-	32	-	32
1992	-	28	-	-	28
1993	-	-	-	45	45
1994	22	-	-	18	40
1996	1	-	-	-	1
1997	-	-	-	-	0
1991	-	-	-	-	0
1998	3	-	-	-	3
1999	-	-	-	28	28
2000	41	-	-	-	41
2001	24	-	-	-	24
2002	-	-	26	29	55
2003	-	-	-	29	29
2005	14	-	-	29	43
2007	21	-	32	-	53
2009	-	-	-	6	6
2010	-	-	-	2	2
2011	-	-	-	6	6
2014	23	-	-	-	23
2016	9	-	-	-	9
2022	28	-	-	34	62
2023	41	-	-	-	41
2024	-	-		114	114
2025	-	-	50	4	54
TOTAL (Ha)	236	28	140	399	804

2.13.5.3 Dunn Creek

Existing rehabilitation at Dunn Creek includes areas south of the Bluff and Dunn Creek Pits, and areas at the western end of the Dunn Creek Pit overburden emplacement area that have been progressively rehabilitated between 1994 and 2022, as shown on Figure 16. Areas at the eastern end of the Bluff Pit overburden emplacement area were rehabilitated during 2014 and 2015.

2.13.5.4 Trap Gully

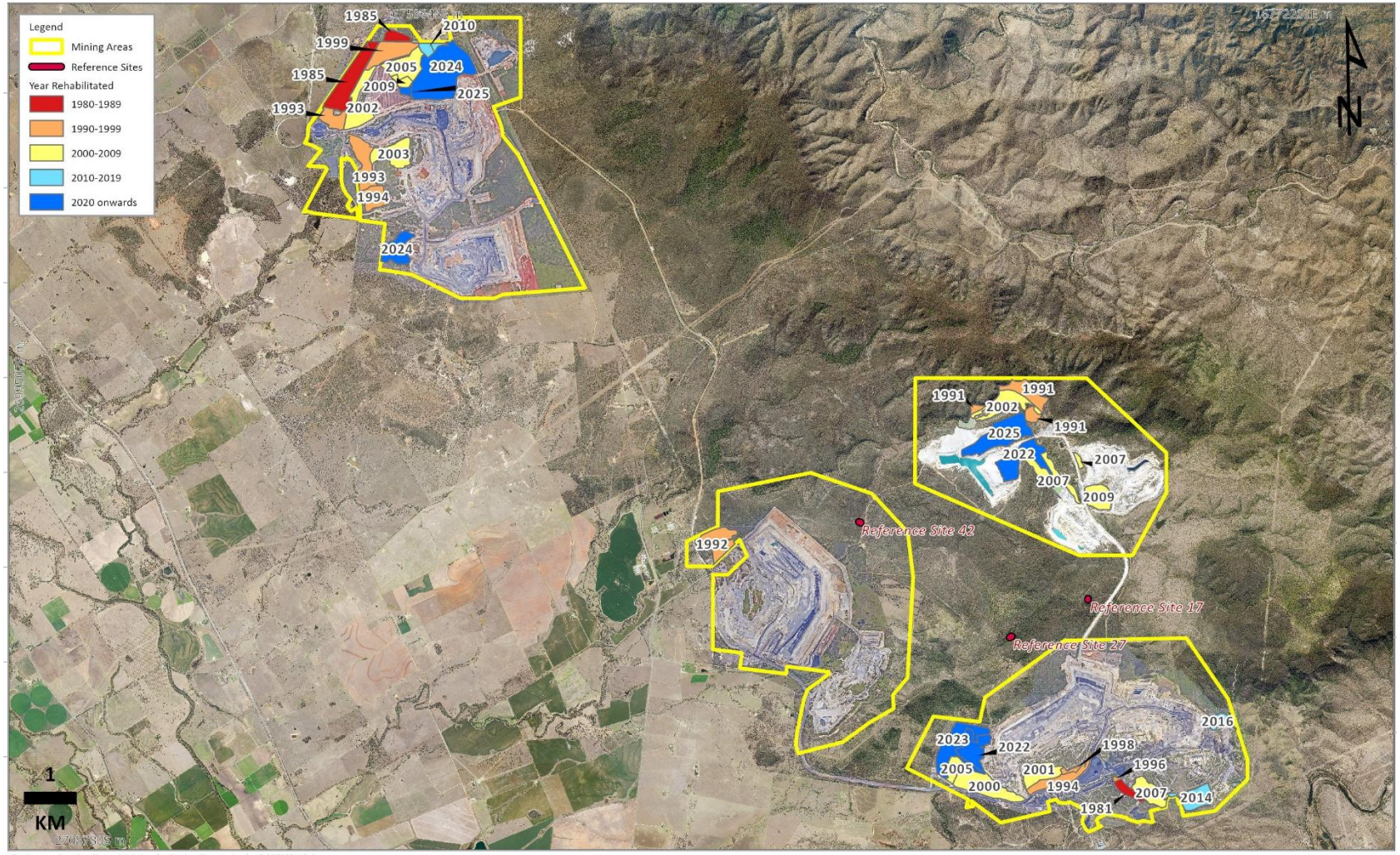
Existing rehabilitation at Trap Gully comprises an area surrounding the Trap Gully Creek Diversion Channel that was completed in 1992.

2.13.5.5 The Hut

Rehabilitation completed at The Hut includes disturbed areas between the southern end of the CVN Pit overburden emplacement area and the northern end of the CVS Pit. These areas were rehabilitated in 2005-2006 and 2022. An area at the southern end of the Eastern Hillside Pit overburden emplacement area was rehabilitated in 2007. Areas surrounding the Oaky Creek Diversion Channel were progressively rehabilitated between 1991 and 2002.

2.13.5.6 Boundary Hill

Existing rehabilitation at Boundary Hill includes areas at the north-western and western ends of the Boundary Hill North overburden emplacement areas that were progressively rehabilitated between 1985 and 2011, as shown on Figure 16.



BATCHFIRE CALLIDE

Existing Rehabilitation Areas
FIGURE 16

Figure 16: Existing rehabilitation areas, including Bushland reference sites, at Callide Mine

2.13.6 Existing Rehabilitation Monitoring

Monitoring of existing rehabilitation began in 2004 and has occurred annually. Before 2021, monitoring was conducted by J. & J. Elsol in collaboration with B.R. Emmerton Pty Ltd (Emmerton). Since then, SLR Consulting Australia Pty Ltd (SLR) has been engaged to undertake the annual rehabilitation monitoring. In 2025, a review of existing monitoring data indicated that Batchfire's existing rehabilitation is meeting or is on a trajectory toward meeting the Bushland PMLU criteria (Batchfire, 2025, p. 10). Routine rehabilitation monitoring will continue to be undertaken to identify any maintenance or corrective actions required to enable existing rehabilitated areas to progressively achieve the RMs (Section 9).

Progressive certification has not been sought to date. All existing rehabilitation will be assessed against the approved milestone criteria for Bushland PMLU under the PRCP Schedule.

2.13.7 Undisturbed Areas

A large portion of the Callide Mine MLs will be undisturbed by mining activities and these areas are shown in Figures 17 to 20. The Post-Mining Land Use (PMLU) for the undisturbed areas will be either bushland or grazing, which is consistent with the pre-mining land use and the land use of the adjoining areas. The specific PMLU for each undisturbed area is indicated on Figures 17 to 20.

The Mount Murchison Nature Refuge extends into the western end of the Dunn Creek mining area and the south-eastern corner of the Trap Gully mining area (Figures 17 and 18). The Nature Refuge was established by a voluntary conservation agreement and is protected under the NC Act. The Nature Refuge has not been, nor will be disturbed by mining activities and will remain in place post-mining. These undisturbed areas do not require any rehabilitation and hence are not discussed further in this PRCP.

Third party infrastructure is located at the Dunn Creek and Boundary Hill mining areas. At Dunn Creek there is a small high voltage electrical substation located west of the mine infrastructure area (Figure 3). At Boundary Hill there are two parallel powerlines located between Boundary Hill North Pit and Boundary Hill East Pit (Figure 6). Third party infrastructure is undisturbed by mining and will remain after mine closure (Figures 17 and 20). Third party infrastructure is not within the scope of the PRCP.

2.13.8 Land Availability

As shown in Table 7, the spoil dumps used for active dumping represent the primary areas available for progressive rehabilitation during mining. As mining progresses down-dip and pits deepen, spoil dump heights increase to accommodate the larger volume of spoil. In-pit spoil disposal is preferred to out-of-pit spoil dumping.

Due to the large scale of the Callide Mine spoil dumps, the external dump surfaces available for rehabilitation represent only a small proportion of the operational dump footprint while dumping continues. Additional areas become available for rehabilitation as spoil dumps reach their final extents.

Progressive rehabilitation opportunities during the operational phase are limited due to the following:

- Spoil dumping occurs across multiple dump faces and bench levels, accessed by several dump and coal access ramps. These ramps are progressively relocated as dumping

advances and constrain the available dump footprint. Rehabilitation of these areas can only occur once the ramps are no longer required.

- Dump heights can only be increased once lower benches have advanced sufficiently to maintain geotechnical stability. As a result, progressive rehabilitation is generally limited to the outer areas of lower benches until dumping is completed on the final bench.
- Spoil dump low-walls advance with the mining operation and increase in height as dumping progresses. Low-wall PMLU areas only become available for rehabilitation once mining and final void backfilling are complete.

Land availability for progressive rehabilitation and closure over the remaining life of the mine is discussed in Section 10.2.

3 Community Consultation

To comply with Section 126C(1)(c)(iii) of the *EP Act*, the PRCP must include details of the consultation undertaken by the applicant in developing the proposed PRCP. This includes consultation previously undertaken as part of existing EA approvals or regular engagement processes, as well as consultation undertaken specifically for the development of the PRCP.

To comply with section 126C(1)(c)(iv) of the *EP Act* and the PRCP Guideline, the PRCP also includes a Community Consultation Plan that outlines how the applicant will undertake ongoing consultation in relation to rehabilitation activities to be carried out under the plan (Section 3.3).

This section includes a discussion of the following:

- Key stakeholder groups involved in the PRCP consultation programs (Section 3.1);
- Details of consultation undertaken for the development of the PRCP (Section 3.2);
- The extent to which the proposed PMLUs and Non-Use Management Areas (NUMAs) are consistent with the outcome of community consultation in the development of the PRCP (Section 3.2.1); and
- Details of proposed ongoing consultation in relation to rehabilitation to be undertaken under the PRCP (Section 3.3).

3.1 Stakeholders

The PRCP Guideline requires that the applicant must attempt to consult all relevant members of the community, noting that the community may include, but are not limited to:

- Affected landholders (such as underlying and adjoining land holders, and holders of land necessary for access to the land to which the proposed PRCP relates)
- Traditional Owners
- Local government
- Local community groups

Batchfire has been operating the Callide Mine since 2016 and has established relationships with local community stakeholders including those with a genuine interest in the rehabilitation and closure of the mine. Based on Batchfire's existing stakeholder knowledge and relationships, the following key stakeholder groups were identified for the PRCP consultation programs:

- Landholders – underlying and adjoining
- Traditional Owners – Gaangalu Nation People;
- Local government – Banana Shire Council;
- State government – DETSI;
- Local Biloela community members and the general public; and
- Mine workforce.

3.2 Consultation for Development of the PRCP

Key stakeholders have been consulted during development of the PRCP. Early consultation has enabled relationships with key stakeholders to be established, and these relationships have been maintained through regular consultation using a range of formats, including:

- Targeted communication (letters/emails);
- Community meetings;
- Site visits;
- Displays at the local Biloela shopping centre;
- PRCP information brochures and feedback forms;
- Town hall sessions for the mine workforce; and
- Information available on the Batchfire website.

Consultation that has been undertaken by Batchfire during development of the PRCP is detailed in the *Community Consultation Register* (Appendix B). The register includes the following details:

- Consultation date;
- Stakeholder consulted;
- Consultation type;
- Information provided to the stakeholder;
- Details of any issues raised by the stakeholder;
- How issues raised were considered;
- Response/decisions/outcomes of consultation; and
- Details of any commitments made by Batchfire as a result of the consultation.

Note that community meetings with underlying and adjoining landholders were not undertaken as normal during 2020, 2021 and 2022 due to COVID-19 restrictions. Communication with landholders during this time was predominantly via email, with one-on-one meetings where required.

3.2.1 Consistency of Consultation Outcomes with PMLUs and NUMAs

Batchfire does not have access to any records of previous consultation undertaken by the previous mine owner/s in relation to PMLUs and NUMAs for the mine. Consultation undertaken by Batchfire during development of the PRCP has therefore included information on the transitioned PMLUs and NUMAs.

A PRCP information brochure and feedback form was widely distributed by Batchfire during development of the PRCP. This brochure provided details of proposed PMLUs and NUMAs and invited input from the community. No concerns with the PMLUs and NUMAs proposed for the Callide Mine were raised during this consultation, and stakeholders supported the land predominantly being returned to the pre-mining land uses of bushland and grazing. As documented in the Consultation Register, the following suggestions for alternative PMLUs were made:

- Use of the Boundary Hill East final void NUMA as a Waste Management Facility by the Banana Shire Council;
- Incorporation of recreational areas such as walking trails, motorbike tracks and fishing areas; and
- Establishment of cultural heritage conservation zone/s.

Batchfire considered these suggestions in light of the transitioned PMLUs, NUMAs and relevant PRCP obligations. The use of the Boundary Hill East final void NUMA as a Waste Management Facility by the Banana Shire Council is not proposed in the PRCP as this is not an approved activity in the Callide Mine EA and detailed technical assessments are required to confirm the feasibility of establishing such a facility in the final void. Batchfire is continuing discussions with the Banana Shire Council in relation to the assessment of the potential feasibility of this option.

Incorporation of recreational areas with the PMLUs was not considered appropriate for the Callide Mine as the land within the MLs will be privately owned post mining, and providing public access to the land for recreational activities would need to be at the discretion of the landholder. It was also concluded that the PRCP is not an appropriate mechanism for the protection and/or management of areas of cultural heritage significance, and it was agreed with the Traditional Owners in PRCP consultation that these matters would continue to be addressed through existing cultural heritage agreements and processes under the *Aboriginal Cultural Heritage Act 2003* (Qld).

The potential for the beneficial re-use of final void water was also raised with stakeholders during PRCP consultation. This option received a positive response from stakeholders including adjoining landholders interested in farm and agricultural water supply opportunities, and the Banana Shire Council. This option is not proposed in the current PRCP as further detailed assessments would be required to confirm the feasibility of this option. However, Batchfire is proposing to conduct further work to assess the feasibility of this option and, if demonstrated to be feasible, may include this in a future PRCP amendment application.

Given the lack of any objections or significant issues raised by stakeholders, the transitioned PMLUs and NUMAs are therefore considered to be generally well supported by the local community and consistent with the outcomes of PRCP consultation.

3.3 Ongoing PRCP Consultation

Batchfire has developed a plan for future community consultation in relation to rehabilitation conducted in accordance with the PRCP. The objectives of this consultation will be to:

- Ensure full and transparent engagement;
- Communicate progressive rehabilitation plans and schedules;
- Communicate mine closure impacts; and
- Address community concerns in relation to the environmental legacy of the mine.
- The community consultation plan developed by Batchfire for the implementation phase of the PRCP is shown in Table 13: Community Consultation Plan.

The consultation plan includes the following:

- Community member(s) to be consulted;
- Engagement type;
- Consultation frequency;
- Information released; and
- How feedback will be considered.

Table 13: Community Consultation Plan

Stakeholder	Engagement Type/s	Proposed Consultation Frequency	Information Released	How Feedback Considered
Traditional Owners				
Gaangalu Nation People Cultural Heritage Coordinating Committee Gaangalu Nation People Native Title	• Face-to-face meeting • Letter and survey to group members as required	• As required to ensure timely resolution of cultural heritage / Native title issues (generally biannually). • 12 months prior to needing the resolution, longer for complicated negotiations • Prior to any PRCP schedule amendments (as necessary)	• Cultural Heritage management and issues • Native Title issues relating to mining activities • Rehabilitation plans and schedules • Closure plans • Monitoring results (as necessary)	Will be dependent on the nature of the feedback but may include provision of additional information or amendment of rehabilitation/closure plans
Water infrastructure owners				
OCW Pty Ltd Sunwater Neighbours with Make Good Agreements	• Face-to-face meeting • Phone or email • Letter and survey to group members as required • Quarterly report where required by agreement	• Quarterly reports • As required for operational aspects of rehabilitation and closure	• Information relating to supply of water as per agreements • Rehabilitation plans and schedules • Closure plans	Will be dependent on the nature of the feedback
Adjoining landholders				
Affected (Underlying and Adjoining) Landholders	• Individual face-to-face meeting • Letter/email as required • Site visit	• At least annually • As required during rehabilitation work, to discuss and agree on mitigation of operational issues	• Information on mining activities • Rehabilitation plans and schedules	Will be dependent on the nature of the feedback but may include provision of additional

Stakeholder	Engagement Type/s	Proposed Consultation Frequency	Information Released	How Feedback Considered
	• Social event (e.g. BBQ dinner) • Newsletter • Complaints procedure	• Biannual social events • Upon completion of PRCP • Prior to any PRCP schedule amendments (as necessary)	• Closure plans • Monitoring results (as necessary) • Information on anticipated impacts to the functionality of their properties. E.g. Access to water, weed management, changes to surface water runoff, impacts to groundwater, increased sediment load in creeks	information or amendment of rehabilitation/closure plans
Easement holders				
Easement holders with infrastructure adjacent to the mine site: Powerlink Ergon Telstra Optus Aurizon	• Face-to-face meeting • Email information regarding possible interruptions • Site visit • Newsletter	• As required for operational aspects of rehabilitation and closure • Annually on-going throughout operational life of mine	• Information on anticipated impacts to the functionality of their operations– mining infrastructure, invasive species, hydrology, traffic, safety & blasting • Rehabilitation plans and schedules • Closure plans	Will be dependent on the nature of the feedback
Local community groups and general public				
	• Annual community progress meeting	• At least annually • Prior to any PRCP schedule amendments (as necessary)	• Current operations and rehabilitation activities • PRCP development	Will be dependent on the nature of the feedback but may include provision of additional

Stakeholder	Engagement Type/s	Proposed Consultation Frequency	Information Released	How Feedback Considered
	• Participation in local community events • Display and survey in local shopping centre • Newsletter • Website		• Information relevant to mine closure • Monitoring results (as necessary)	information or amendment of rehabilitation/closure plans
Mine workforce				
Mine workforce	• Toolbox meeting • Presentation • Social event • Newsletter • Feedback survey	• As required • At least quarterly • Prior to any PRCP schedule amendments (as necessary	• Current operations and rehabilitation activities • PRCP development • Progressive rehabilitation activities and schedule • Closure plans	Will be dependent on the nature of the feedback but may include provision of additional information or amendment of rehabilitation/closure plans
Local Government				
Banana Shire Council	• Face-to-face meeting • Email • Site visit • Newsletter	• As required during rehabilitation work (e.g. when issues arise) • Regular monthly catch-up with CEO	• Information regarding possible interruptions • Information on anticipated amenity or operational impacts e.g. mining infrastructure, invasive species, hydrology, traffic, safety and blasting • PRCP development	Will be dependent on the nature of the feedback but may include provision of additional information or amendment of rehabilitation/closure plans

Stakeholder	Engagement Type/s	Proposed Consultation Frequency	Information Released	How Feedback Considered
			• Progressive rehabilitation activities and schedule • Closure plans • Monitoring results (as necessary)	
Government Agencies				
DETSI Department of Resources (Brisbane and Rockhampton)	• Face-to-face meeting • Site visit	• Quarterly meeting • As required to address any issues that arise • Annual site visit	• Information on current operations and progress, new developments • PRCP Implementation	Will be dependent on the nature of the feedback but may include provision of additional information or amendment of rehabilitation/closure plans

4 Post-Mining Land Use

4.1 Introduction

A Post-Mining Land Use (PMLU) is defined under section 112 of the EP Act as the purpose for which the land will be used after all relevant activities for the PRC Plan carried out on the land have ended. Under the transitional provisions of the EP Act, PMLUs that have been previously addressed in a Land Outcome Document (LOD) can be transitioned into a PRCP schedule.

The LODs for the Callide Mine, relevant to the PMLUs and NUMAs, are provided in Appendix C and are as follows:

- Callide Mine EA (EPML000720413) (Appendix C1);
- *Callide Mine Rehabilitation Management Plan* (RMP) (Batchfire Resources, 2026) (Appendix C2);
- *Callide Mine Report on Rehabilitation Acceptance (Completion) Criteria* (RAC Report) (Anglo Coal, 2003) (Appendix C3); and
- *Callide Mine Report on Completion Criteria for Residual Voids* (Anglo Coal, 2005) (Appendix C4).

The LODs identify the following PMLUs for the Callide Mine:

- Bushland; and
- Cattle grazing

An additional PMLU is proposed for areas associated with constructed watercourse infrastructure:

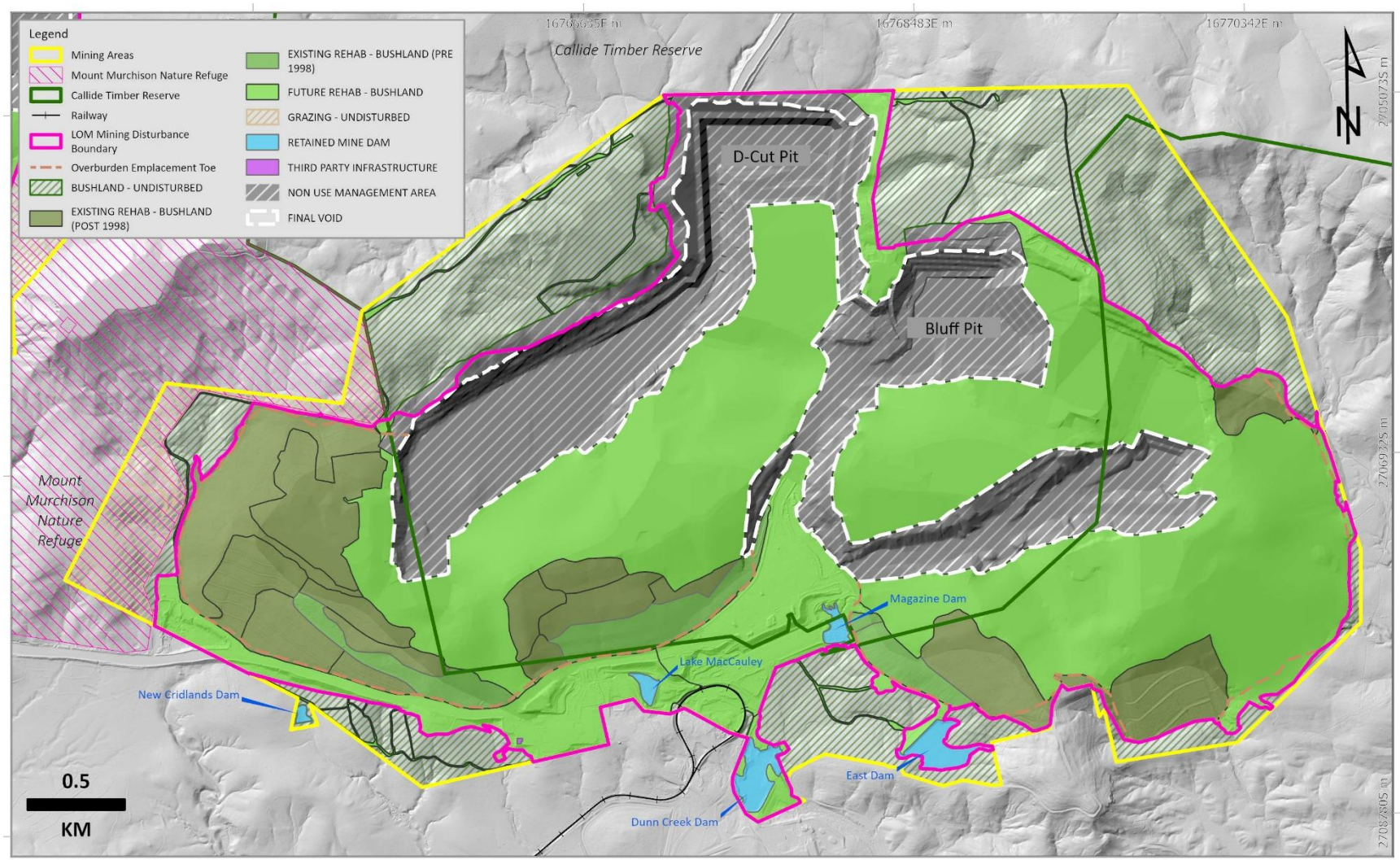
- Watercourse (Engineered Diversion)

Together, these land uses provide for productive, low-risk post-mining outcomes; support biodiversity and ecological function; and ensure that final landforms remain safe, stable, and non-polluting with long-term resilience consistent with the EP Act. Furthermore, in accordance with section 126C(1)(d) of the EP Act, the proposed PMLUs are consistent with the outcomes of community consultation (Section 3.2.1) and the relevant government strategies and plans for land within the MLs.

The location of the proposed PMLUs within the Callide Mine MLs are shown in Figures 17 to 20 and show the following features:

- The LOM mining disturbance boundary (i.e., maximum disturbance footprint);
- Total ML boundary for each mining area;
- Location of PMLUs within the ML areas; and
- Location of NUMAs within the ML areas.

As explained in Section 6.1.3, there are no floodplains, as defined by section 41C of the EP Regulation, within the Callide Mine MLs and hence the PMLU figures do not include any flood plain extents.



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Dunn Creek - Post Mining Land Use
FIGURE 17

Figure 17: Dunn Creek - Post Mining Land Use

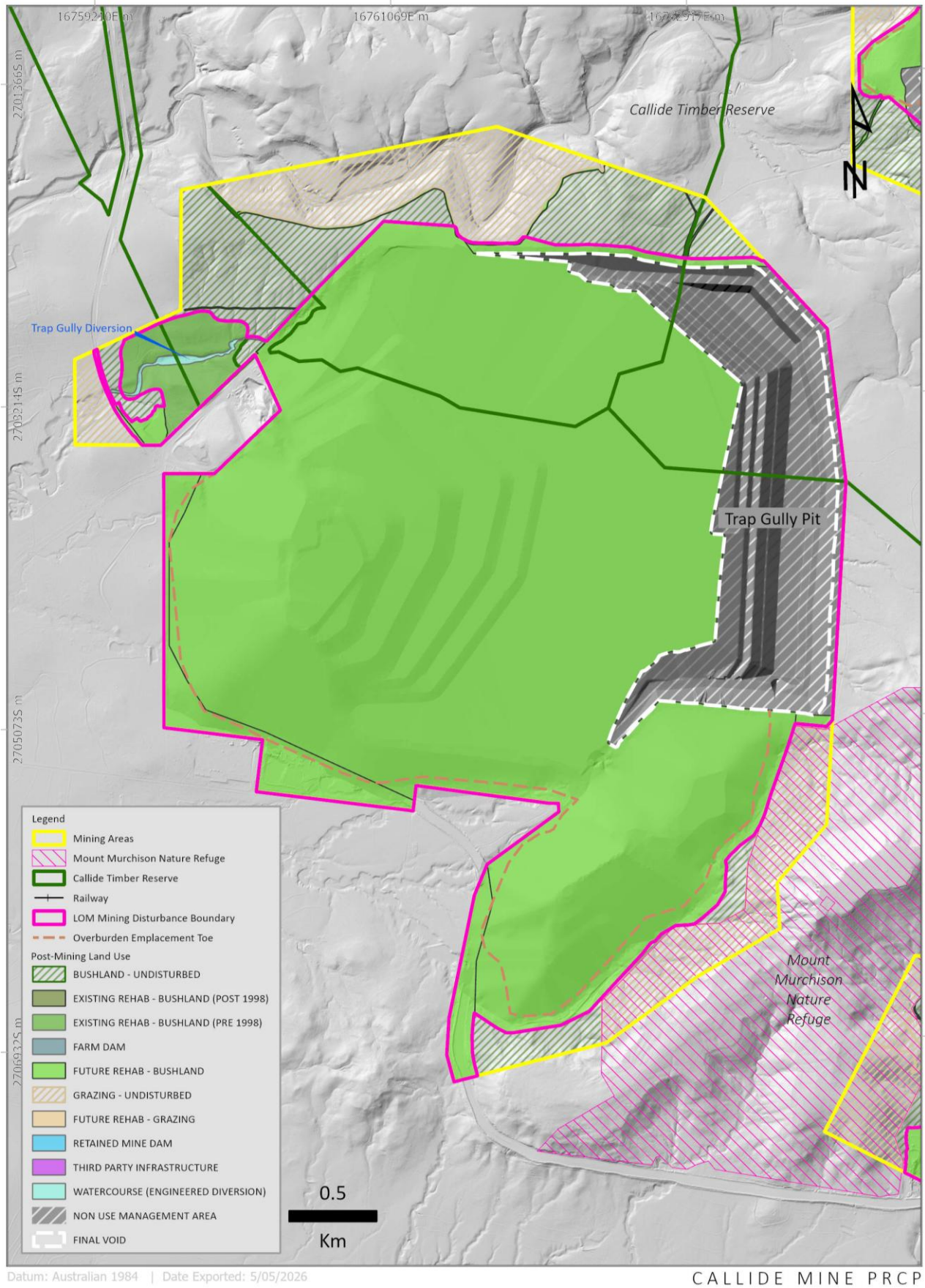


Figure 18: Trap Gully - Post Mining Land Use

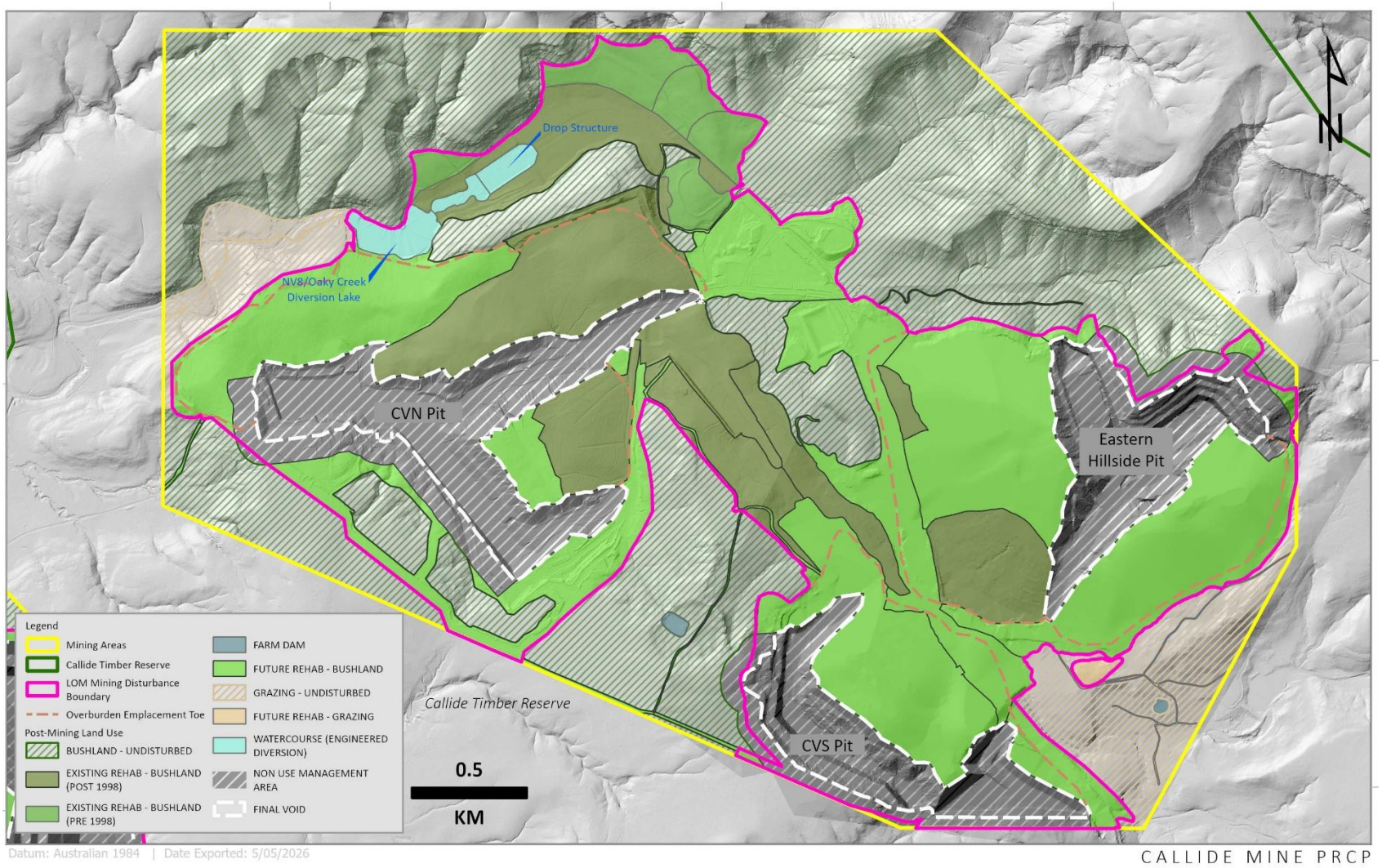


Figure 19: The Hut - Post Mining Land Use

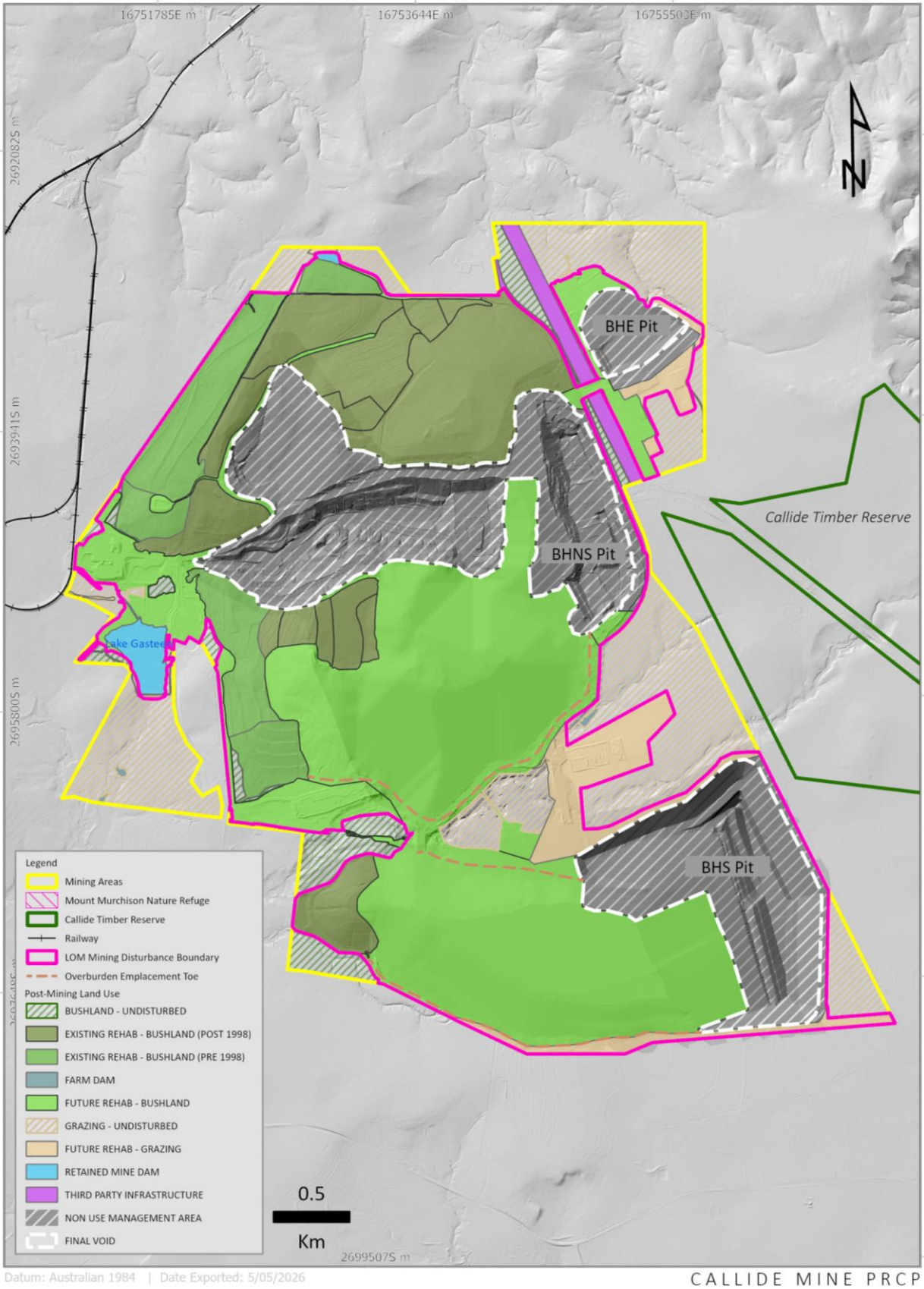


Figure 20: Boundary Hill - Post Mining Land Use

4.2 Nominated PMLUs

4.2.1 Demonstration of stable condition

All nominated PMLUs described in this section are designed to achieve a stable condition in accordance with section 111A of the Environmental Protection Act 1994.

This will be achieved through the implementation of well-established rehabilitation methods, removal of contaminants and redundant infrastructure during decommissioning, and construction of landforms capable of sustaining the nominated PMLU in the long term.

Demonstration of stable condition will be verified through achievement of the relevant milestone criteria.

4.2.2 Consistency with Regional and State Planning Frameworks

The nominated PMLUs are consistent with relevant regional and state planning frameworks, including:

- The *Central Queensland Regional Plan;*
- The *Banana Shire Planning Scheme 2021; and*
- The *Queensland Resources Industry Development Plan.*

These frameworks recognise the importance of maintaining biodiversity, supporting agricultural productivity and ensuring that post-mining land uses are compatible with surrounding land uses. The proposed bushland and grazing PMLUs are consistent with these objectives.

4.2.3 Bushland PMLU

The predominant post-mining land use (PMLU) for rehabilitated areas at Callide Mine will be bushland. The bushland PMLU will be similar to pre-mining and adjoining areas that have similar landscape and vegetation features, including the Callide Timber Reserve.

Within the bushland PMLU there will be retained infrastructure to support the sustainability of the overall PMLU. i.e. water storages for animal watering, and access tracks/roads.

The bushland PMLU will achieve a stable condition in accordance with section 111A of the EP Act, as described in Section 4.2.1. The bushland PMLU also satisfies the requirements of Schedule 8A of the EP Regulation and is consistent with the regional and state planning frameworks described in Section 4.2.2.

A bushland PMLU is viable, having regard to the use of land in the surrounding region and is consistent with the pre-mining land use. Significant areas of the Callide Mine MLs and the adjacent Callide Timber Reserve have similar bushland characteristics.

The bushland PMLU, designed to be comparable to the surrounding ecosystem and the unmined reference sites, will also provide support to the Mount Murchison Nature Refuge by reinforcing landscape connectivity through the planting and promotion of species that feature in the Nature Refuge.

The detailed rehabilitation methods for the bushland PMLU are described in Section 2.13.5.1.

The rehabilitation methods were modified in 1998 with the introduction of deep ripping into surface preparation and the elimination of non-native pasture grasses from the seed mix. Prior to 1998, introduced pasture grasses were used extensively in the rehabilitation seed mix and deep ripping was not conducted as part of surface preparation. These changes to the rehabilitation methods were

introduced to reduce the potential for erosion during the revegetation establishment phase, and to limit the spread of introduced pasture species such as *Cenchrus ciliaris* (Buffel grass).

The rehabilitation methods for the bushland PMLU are well-established, successful methods that have been used for all rehabilitation conducted at Callide Mine from the 1980s to date. The Callide Mine rehabilitation methods are also consistent with methods and rehabilitation standards widely used in the Central Queensland coal mining industry. The milestone criteria for the bushland PMLU have been developed taking into account relevant completion criteria from the RAC Report with amendments, where necessary, for the purposes of the PRCP.

4.2.4 Grazing PMLU

The grazing PMLU is proposed in suitable areas adjoining existing cattle grazing land. The grazing PMLU will meet the 'stable condition' definition in accordance with section 111A of the EP Act, as described in Section 4.2.1. It also satisfies the requirements of Schedule 8A of the EP Regulation and is consistent with the regional and state planning frameworks described in Section 4.2.2. A grazing PMLU is viable, having regard to the use of land in the surrounding region and is consistent with the pre-mining land use. Significant areas of the Callide Mine MLs were historically grazed, and adjacent properties are currently utilised as grazing land.

The rehabilitation methods for the grazing PMLU and final landform designs are well-established, successful methods widely used in the Central Queensland coal mining industry. The milestone criteria for the grazing PMLU have been developed taking into account relevant completion criteria from the RAC Report with amendments, where necessary, for the PRCP.

4.2.5 Watercourse (Engineered Diversion) PMLU

At Callide Mine, PMLU of watercourse (engineered diversion) applies specifically to the creek diversions associated at Trap Gully Creek within the Trap Gully mining area (Figure 18) and Oaky Creek within The Hut mining area (Figure 19). These areas include engineered creek diversions and diversion outlets. These diversions were both approved and constructed under the Water Act. The Water Licence for the Trap Gully Creek has since been relinquished; however, the Oaky Creek Diversion continues to be maintained in accordance with a Water Licence.

In accordance with the Water Licence, the Oaky Creek Diversion will require submission of a Water Licence relinquishment application supported by a Final Monitoring and Evaluation Report that is certified by a Registered Professional Engineer of Queensland (RPEQ), and approval of the licence relinquishment by the Queensland Government. In accordance with the completion criteria for the Watercourse (engineered diversion) PMLU, a Final Monitoring and Evaluation Report certified by an RPEQ will also be required for the Trap Gully Diversion prior to mine closure.

4.3 Retained Infrastructure

Retained infrastructure is not proposed as a standalone post-mining land use (PMLU). Any infrastructure required to support the agreed final landform, drainage function or ongoing land use outcomes will be embedded within, and managed as part of, the applicable PMLU. Each of the retained infrastructure items will be beneficial to the bushland and grazing PMLUs.

Selected water storages will be retained within the bushland and grazing PMLU (Figure 17 to Figure 20). These water bodies will provide a reliable water source for both stock and native fauna and contribute to habitat diversity within the rehabilitated landscape. Vegetation will be established around the margins to support ecological function and integrate the water storages into the surrounding bushland.

Water quality will be monitored to ensure suitability for stock and fauna consumption against ANZECC stock water guidelines.

5 Non-Use Management Areas

Under the transitional provisions of the EP Act, NUMAs that have been previously addressed in a Land Outcome Document (LOD) can be transitioned into a PRCP schedule. DETSI advised Batchfire on 2 May 2025 that that while it does not agree that the '*2003 Final Void Water Modelling Report*' constitutes a LOD, the department does agree that it reflects the size and location of the pre-approved NUMAs (Callide Mine EA conditions F8 and F9).

5.1 Nominated NUMAs

The Callide Mine NUMAs include the 9 residual voids as listed below in Table 14 and shown in Figure 17 to Figure 20. The NUMAs have been designed to achieve an area that is safe and structurally stable, as required by the Geotechnical Design Report V2 (Jan 2024).

Table 14: NUMA locations and area

Void	Void Area (ha)	Total NUMA area – void and set-back area (ha)
Dunn Creek		
Dunn Creek	173.5	206.7
The Bluff	156.0	164.6
The Hut		
Central Valley North (CVN)	72.8	90.5
Central Valley South (CVS)	45.1	60.3
Eastern Hillside	49.9	63.0
Trap Gully		
Trap Gully	190.5	203.1
Boundary Hill		
Boundary Hill South	147.3	156.0
Boundary Hill North	249.6	258.6
Boundary Hill East	25.8	32.4

The total proposed NUMA area (including a geotechnical setback) is 1,235.27 ha. The areas of the final voids have been minimised as far as possible in the development of the final landform designs and are consistent with the areas of the final voids identified in the LOD.

The NUMAs will incorporate safety features to prevent access, including:

- A safety bund and fencing constructed at the NUMA extents to prevent livestock and human access
- Signage at regular intervals along the fence

5.1.1 Boundary Hill South NUMA

The Callide Mine EA condition F9 specifies the rehabilitation requirements, location and area of the Boundary Hill South residual void NUMA.

5.1.2 All other NUMAs

The Callide Mine EA condition F8 provides final landform design criteria and requirements for residual void NUMAs for the Boundary Hill (excluding Boundary Hill South), Dunn Creek, Trap Gully and The Hut mining areas, including acceptance criteria stated in the Land Outcome Document *Callide Mine Report on Completion Criteria for Residual Voids 2005 (Anglo Coal, 2005*) (Appendix C4). This report describes final void volumes and depths, and final void water balance modelling results that support the acceptance criteria. The quoted final void geometries and water balance modelling results are based on the final voids at the locations and to the extents presented in the *Report on Final Void Water Modelling Initial Investigations 2003 (Water Solutions, 2003)* (Appendix C4). The *Report on Final Void Water Modelling Initial Investigations 2003 (Water Solutions, 2003)* is also referenced repeatedly in the *Callide Mine Report on Completion Criteria for Residual Voids 2005 (Anglo Coal, 2005*). As such, the locations and areas of the final voids presented in the *Report on Final Void Water Modelling Initial Investigations 2003 (Water Solutions, 2003)* are relevant to section 754(4) of the EP Act.

Where the exact locations of the final void NUMAs within the Boundary Hill (excluding Boundary Hill South), Dunn Creek, Trap Gully and The Hut mining areas differ from those identified in the Land Outcome Document, there are no material changes in environmental impacts associated with the location differences.

5.2 Community Considerations

In accordance with section 126C(1)(d) of the EP Act, the NUMAs are consistent with the outcomes of community consultation (Section 3.2.1). There are no government strategies or plans that are relevant to the transitioned final void NUMAs.

5.3 Management Methods

The required management methods for the residual void areas are specified in EA conditions F8 and F9 and are consistent with best practice management measures commonly applied to residual voids in the Central Queensland coal mining industry. EA conditions F8 and F9 also refer to acceptance criteria for final voids stated in the *Callide Mine Report on Completion Criteria for Residual Voids 2005 (Anglo Coal, 2005)* and these have been adopted in the management measures and completion criteria provided in the Schedule.

6 Rehabilitation Management Methodology

This section provides the justification for the rehabilitation methods for PMLUs described in Section 4 and management methods for NUMAs described in Section 5.

6.1 General Rehabilitation Practices

6.1.1 Hydrogeology

Section 2.5 provides a description of the local groundwater setting.

6.1.2 Groundwater modelling

Following submission of the draft PRCP (April 2023), a site wide groundwater model was prepared in late 2023 to address former EA condition D6 and Associated Water License (AWL) conditions for a contemporary groundwater model for mining operations. The key features of the site-wide groundwater model were that:

- it was designed using Batchfire's updated September 2023 geology model:
- it incorporated additional drilling logs (including 12 additional PRCP bores drilled in March 2023)
- it was calibrated using all relevant available monitoring data and permeability data collected up to September 2023 (including initial data from the PRCP bores and landholder/water supply bores); and
- the predictive modelling for mining operations was based on the draft PRCP life of mine extents/layouts.

DETSI endorsed this model in mid-2024 for use in establishing EA groundwater level triggers and annual reporting, and DLGWV approved use of the model for AWL compliance in mid-2025. As an operational model, the 2023 site-wide groundwater model did not include a post-closure modelling scenario.

In 2025, the post-closure predications were re-run, using Batchfire's updated 2023 site-wide groundwater model to confirm whether it predicts final voids to act as groundwater sinks or flow through conditions. The observed data indicates that flow-through conditions are occurring at the existing Boundary Hill East void, and voids at the Hut. The updated model confirmed previous predictions of post-closure groundwater sinks at Trap Gully and Boundary Hill south. Boundary Hill North was also now predicted to function as a groundwater sink. Since this time, Batchfire has prepared updated final landforms, and the updated model will inform a revised PRCP groundwater report (Appendix D). The updated PRCP groundwater report, required in Condition PRCP14, will include:

- A description of the local geology, the existing groundwater regime, the groundwater regime at the end of mining and the groundwater regime post closure and at equilibrium.
- A representative cross-section of the residual void, showing groundwater levels in the various hydrostratigraphic units.
- Predictions of post-mining groundwater levels in each hydrogeological unit.
- Prediction of groundwater inflows into the open pit voids post mining.
- Information on post-closure recovery rates and timeframes in each hydrogeological unit.

- Assessment of the groundwater levels around the final voids, and confirm any voids that are not groundwater sinks.
- Figures showing relevant groundwater elevations and depths (including the groundwater table) post closure.
- Post-closure groundwater monitoring requirements, and suggested groundwater quality and level trigger limits.

Upgraded groundwater model results indicate that seepage from final void lakes to groundwater is likely. Batchfire will conduct further work as part of the PRCP approval process to assess the potential groundwater quality effects and consider feasible mitigation and/or management measures for the relevant final voids.

Feasible measures that may be considered include dewatering of final void water for beneficial reuse. Dewatering a final void would enable Batchfire to maintain the void lake at a lower elevation than the surrounding groundwater table, thereby establishing a groundwater sink in the dewatered final void. The beneficial reuse of pit/void water by adjoining landholders is a well-established site water management practice at Callide Mine and is specifically authorised by the Callide Mine EA. Batchfire holds numerous beneficial reuse agreements with adjoining landholders who currently use pit water for farm water supply and agricultural purposes.

6.1.3 Flooding

There are no floodplains, as defined by section 41C of the EP Regulation, within the Callide Mine MLs as there are no watercourses with a stream order of 4 or higher under the Strahler stream order classification system within the MLs. Notwithstanding the low flood risk, DETSI have confirmed that flood modelling may be undertaken within 12 months following approval of the PRCP schedule, reflected in Condition PRCP18.

6.1.4 Waste Characterisation

Overburden geochemical characterisation for each of the four mining areas was undertaken by Soil Conservation and Environmental Services (*Callide Coalfields – An Assessment of Overburden Properties for Rehabilitation, 1991*)(Appendix I). The key conclusions were:

> *"Acid potential was absent from the majority of the overburden material (i.e. overburden excluding carbonaceous material); and rehabilitation would require topsoil due to the limitations of overburden as a plant emergence zone"*

To address these issues, the current rehabilitation methods include the burial of any carbonaceous material at the surface of reprofiled overburden emplacements and the use of topsoil in revegetation. The key conclusions of the overburden geochemical characterisation are consistent with operating experience at Callide Mine over many decades, where issues associated with overburden geochemistry adversely impacting rehabilitation and/or generating acid drainage have not arisen. Consequently, the management of overburden geochemistry does not require any specific additional management measures in the rehabilitation method or mine closure planning.

6.1.4.1 Soil and Capping Material Assessment

A growth media assessment has been undertaken to support the development of this PRCP '*Cover Material Resource Assessment for PRCP, SLR, 2022*'.

Topsoil is managed in accordance with Batchfire's Environmental Management System (EMS), which includes procedures for stripping, storage, and placement. Key governance documents include EMS_06 Topsoil Management Plan (Appendix H) and EMS_07.2 Permit to Disturb Procedure, which together establish the controls for vegetation clearing, stripping depth and stockpile management.

Section 2.6 provides a summary of the soil types and topsoil stripping depths within each of the Callide Mine mining areas.

6.1.4.2 Quality of available resources

The key chemical and physical properties of the three capping resources (topsoil, basalt and spoil) were assessed (SLR, 2022) and are summarised in Table 15. Where intervention is required to improve vegetation establishment, parameters are shaded with orange or red. Batchfire's rehabilitation planning process requires testing of topsoil by an AQP prior to it being respread, to confirm any ameliorants, including gypsum, lime, compost and fertiliser, required to achieve successful revegetation. The topsoil utilised is compatible with the revegetation species (Section 6.1.8), given that native and local species are used in rehabilitation.

Cover Material Resource Assessment for PRCP, SLR, 2022 notes that:

'*Based on the physical and chemical properties of the materials assessed, the topsoil and <80 mm screened basalt is considered suitable to support the PMLU outcomes',*

and,

'Spoil materials on site can be considered as generally resilient with material that degrades slowly by fracturing and surface fretting'.

Table 15: Summary of soil sampling analysis and parameter rating (SLR, 2022)

Parameter	Boundary Hill Topsoil	Boundary Hill Subsoil	Dunn Ck Topsoil	The Hut Topsoil	Trap Gully Topsoil	Trap Gully Subsoil
Number of samples	7	1	8	10	3	1
pH	Slightly to strongly acidic	Slightly acidic	Very strongly acidic to moderately alkaline	Strongly acidic to mildly alkaline	Alkaline	Neutral
ESP	Non-sodic to sodic	Non-sodic	75% non-sodic	70% non-sodic	Non-sodic	Non-sodic
ECe	Non-saline	Non-saline	75% samples were non-saline	80% of samples were non-saline	Non-saline	Non-saline
EAT	Non dispersive to dispersive on remoulding	Non dispersive	Not dispersive to moderately dispersive	Non dispersive to dispersive on remoulding	Not determined	Not determined
OM	Extremely low to high	Extremely low	Moderate to very high	Low to very high	Extremely low to high	Moderate
CEC	Very low	Very low	Very low to high	Very low to moderate	Moderate to very high	High
Ca:Mg	Ca deficient to low	Ca low	Ca deficient to low	Ca deficient to low	Ca low	Ca low
P	Very low	Very low	Low to moderate	Very low to moderate	Moderate to high	Moderate
N	Low	Very low	Low to high	Very low to very high	Low to high	Very low

ESP: Exchangeable sodium percentage
CEC: Cation exchange capacity
ECe: Electrical conductivity (saturated paste) calculated
EAT; Emerson aggregate test

OM: Organic matter
Ca:Mg: Calcium to magnesium ratio
P: Phosphorus (Colwell)
N: Nitrate as N

Note on table colour-coding:
Green: Not limiting pasture or crop growth.
Orange: Marginal level, possibly limiting maximum production of crop or pasture
Red: Deficient or toxic, limiting factor for maximum crop or pasture growth

6.1.4.3 Quantity of available resources

The rehabilitation objectives at Callide require growth media that will support vegetation establishment for the planned PMLUs. There is sufficient quality of suitable growth media available on site for the rehabilitation of disturbed areas to grazing, bushland and watercourse (engineered diversion) PMLUs. The Topsoil Management Plan (Appendix H) requires an up-to-date topsoil inventory that identifies topsoil stockpile locations and quantities in each of the four mining areas.

Batchfire has completed a reconciliation of the remaining life of mine (LOM) rehabilitation topsoil requirements with existing stockpiled topsoil volumes and future topsoil stripping volumes (Table 16)

Table 16: Remaining LOM Rehabilitation Topsoil Balance

Projected stockpile volume at end of mine life	Topsoil required for rehabilitating total disturbance to 2026	Topsoil available for rehabilitating future disturbance
4,637,792 lcm	2,776,541 lcm	1,861,251 lcm

Topsoil will be placed at a minimum average depth of 0.15 m at the Hut, Trap Gully, Boundary Hill, and Dunn Creek.

Rock can be utilised on the steeper final landform slopes to improve the erosion resistance. Rock will be sourced from the mined overburden and interburden, with sufficient quantity available on-site of the planned rehabilitation. Utilised rock will be screened to the required size and used directly on rehabilitation areas or stockpiled when required to ensure efficient quantity for the planned rehabilitation.

6.1.5 Landform Design

6.1.5.1 3D Design

The 3-dimensional final landform design for each of the four mining areas are shown in Figures 21 to 24.

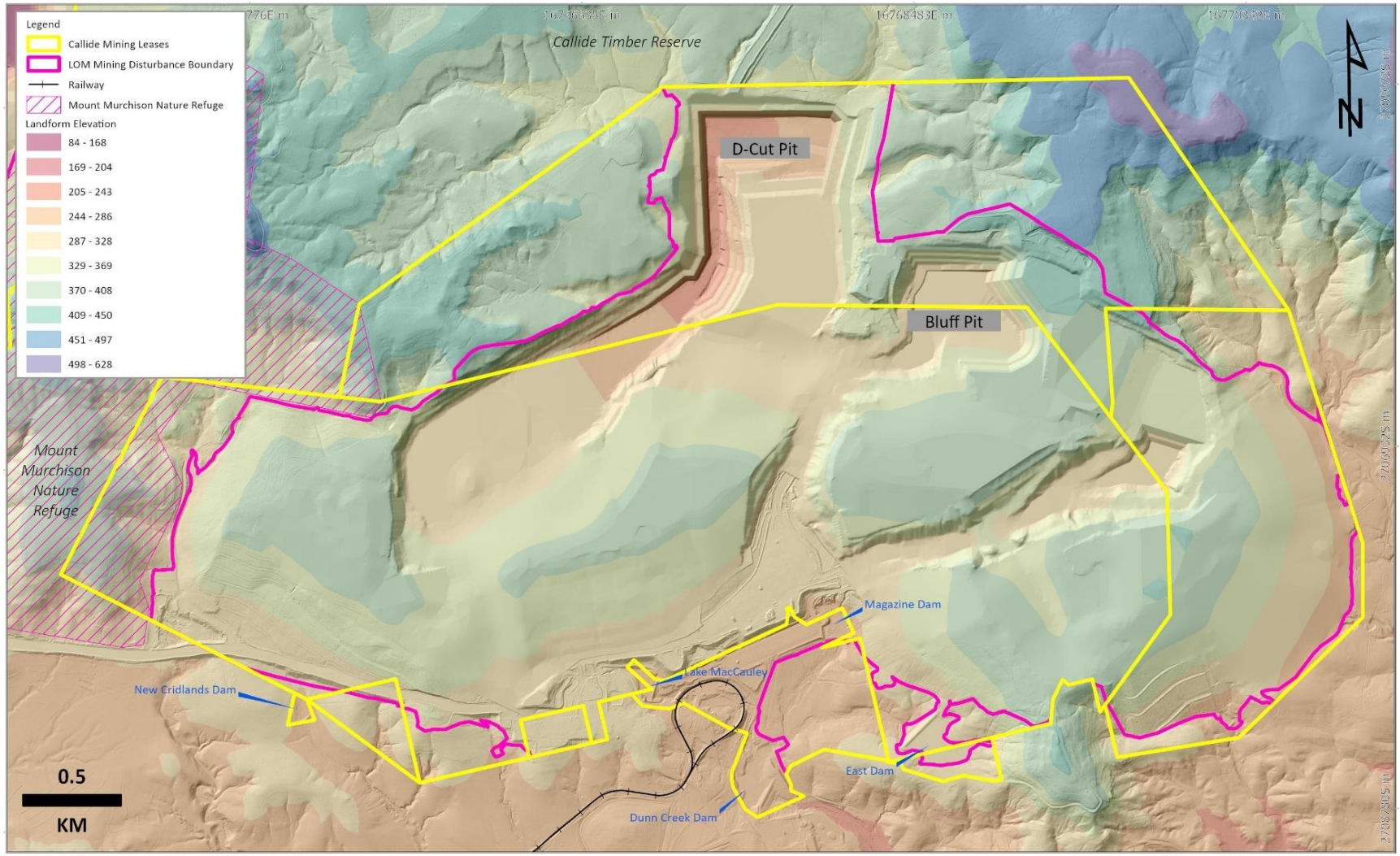
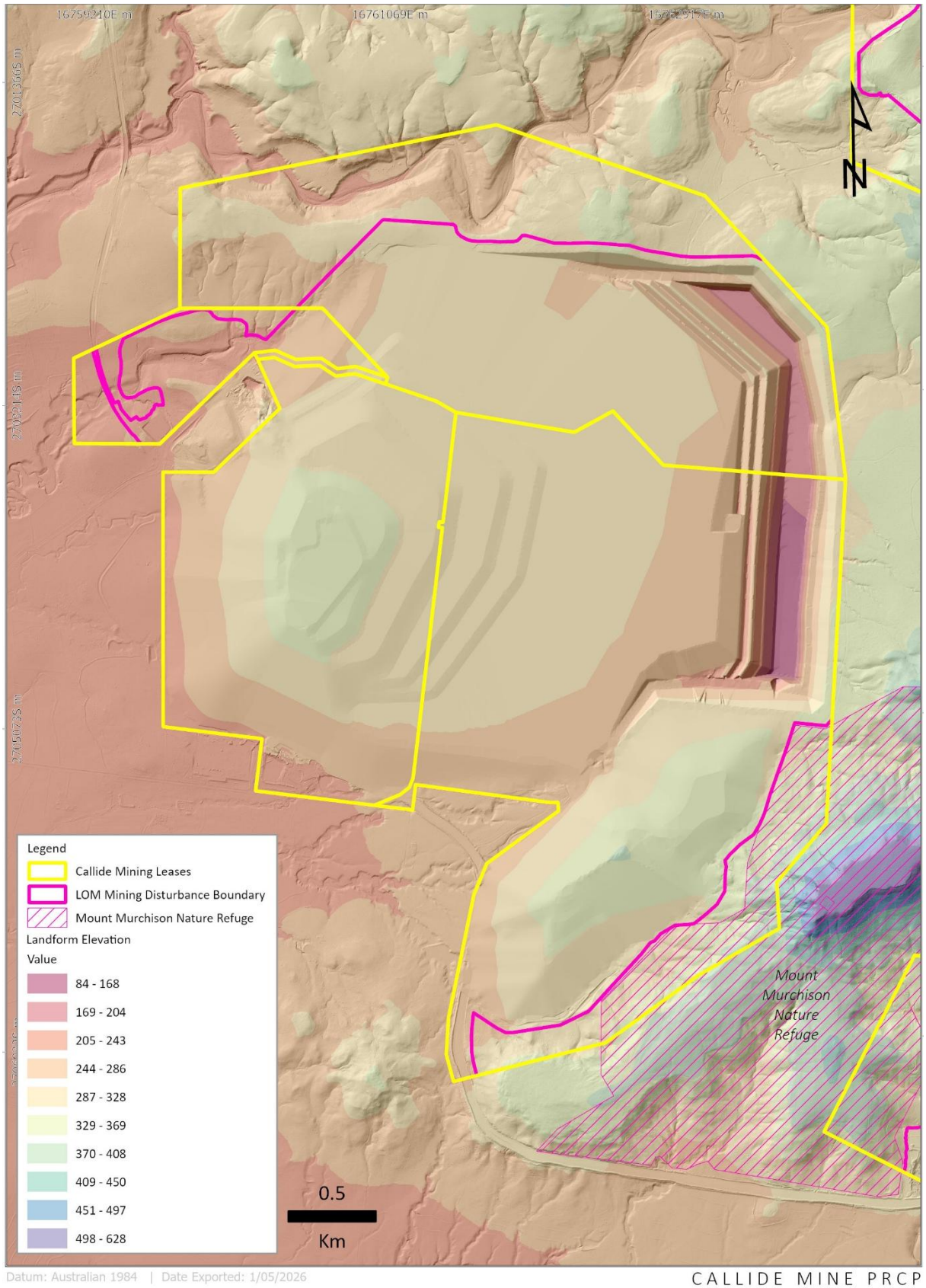


Figure 21: Dunn Creek - Final Landform



CALLIDE MINE PRCP

Trap Gully - Final Landform

FIGURE 22

BATCHFIRE CALLIDE

Figure 22: Trap Gully - Final Landform

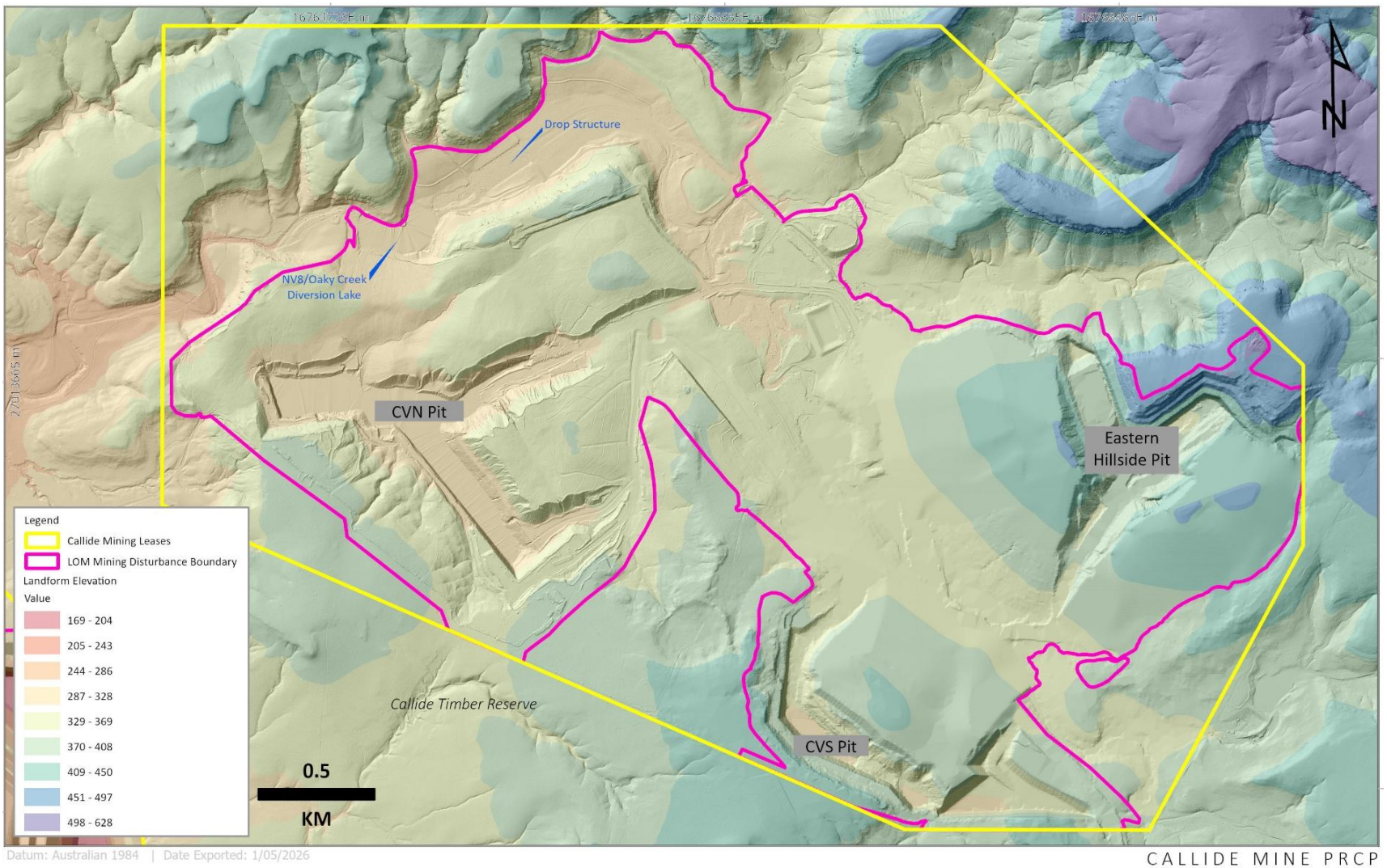
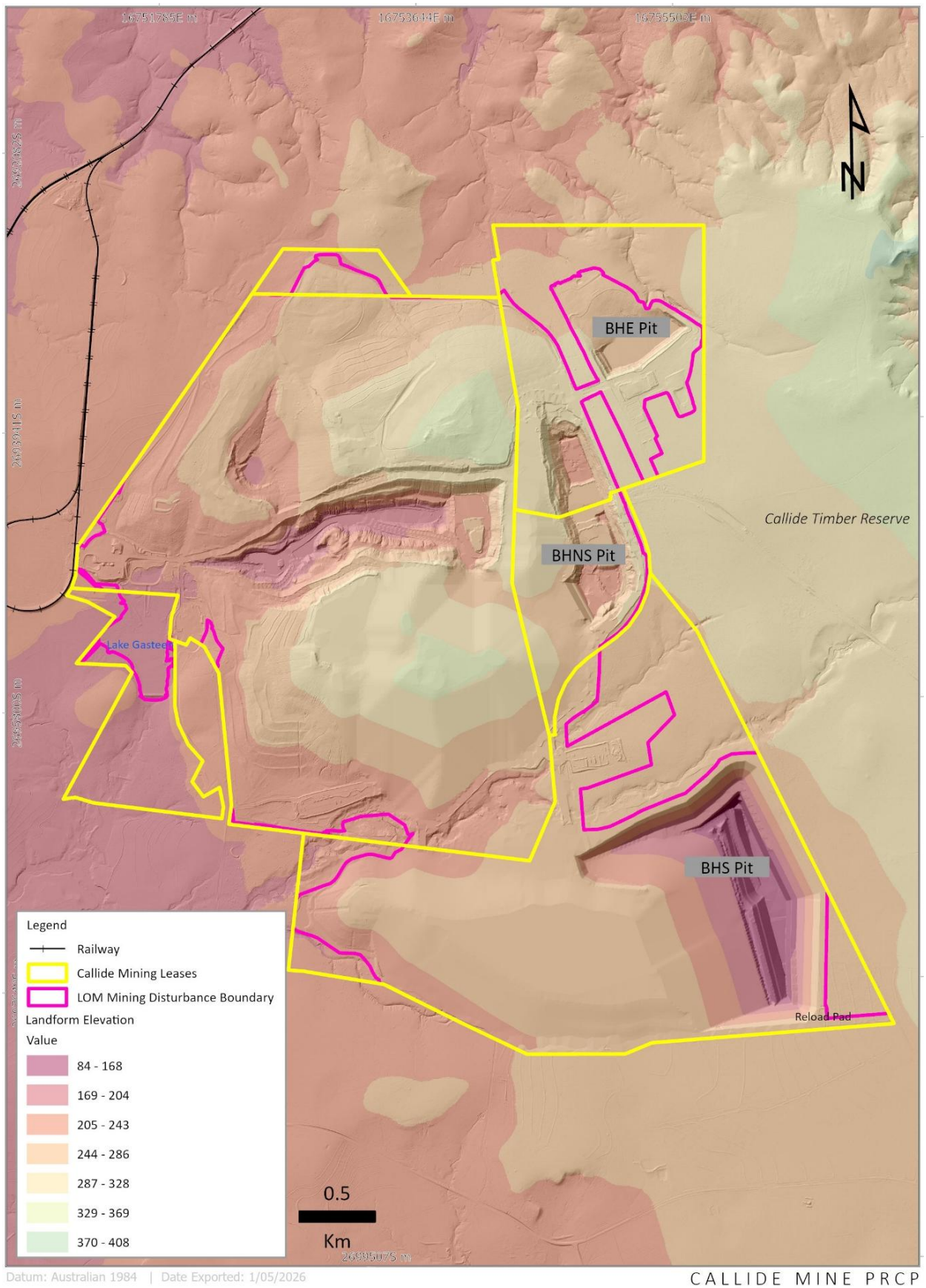


Figure 23: The Hut - Final Landform



CALLIDE MINE PRCP

Boundary Hill - Post Mining Land Use

FIGURE 24

BATCHFIRE CALLIDE

Figure 24: Boundary Hill - Final Landform

6.1.5.2 Method for determining landform design

The final landform design is compliant with the final landform design criteria specified in EA Tables F2 and F3 (Table 17) and the requirements of Appendix 2, Figure 2 (for Boundary Hill South). The overburden emplacement slopes in the final landform are generally 15%.

Table 17: Summary of EA tables F2 and F3 – Design Criteria

Disturbance Type	Slope or Configuration	Drainage
Dragline and pre-strip soil (except Dunn Ck A and S Cut spoil) – outer slopes	Overall slope angle of 15% on outer slopes.	Graded banks at 10 m vertical intervals (approx. Every 60 m along the slope)
Dunn Creek A & S Cut spoil – outer slopes	Overall slope angle of 25% on outer slopes, 120m slope length, basalt mulch cladding.	Berms or graded banks at 120 m spacing along the slope
Internal slopes	Generally, 15% or flatter.	Graded banks at 10 m vertical intervals
Trial slopes	From 15% to 25% with topsoil or basalt mulch cladding.	Graded banks at 10 m vertical intervals
	Up to 37% (angle of repose).	Cut off drain/diversion bund across top of slope
Void – High wall	75° slope angle.	Safety bunds will be constructed along the top of the high walls and along the crest of the pre-strip benches. The pre-strip benches will be shaped to shed runoff over the high wall at several locations to limit erosion.
Void – Low wall and ramp spoil	Generally at angle of repose.	

As required by EA condition F1, the final landform is safe and structurally stable, and has been designed to be consistent with the surrounding topography, as far as practicable. The final landform is also consistent with the requirements for the designated PMLUs for each mining area. Landform stability will be achieved by ensuring the final landform meets the EA design criteria and the successful establishment of groundcover to assist in the prevention of erosion and sedimentation.

An assessment of the final void NUMA slopes against the residual void design outcomes specified in EA Table F3 is provided in the Final Landform Slope Assessment (Appendix F), which indicates that the final void slopes generally achieve the design criteria. Notwithstanding this, Batchfire will undertake landform evolution modelling (LEM) in accordance with Condition PRCP16. The LEM will demonstrate that the proposed landforms can be expected to be erosionally, geochemically and geotechnically stable.

The final landforms have been designed to remain wholly within the MLs and do not extend inside the Mt Murchison Nature Refuge (Figure 21 and Figure 22).

Other than the final voids, the final landforms are generally designed to be free-draining. As discussed in Section 6.1.3, there are no floodplains within the Callide Mine MLs.

EA Table F2 (Table 17) allows for the establishment of trial slopes on the overburden emplacements in the final landform at slopes greater than 15% and up to angle of repose. Any trial slopes would be specified during the final design for rehabilitation of specific overburden emplacement areas as per Rehabilitation Milestone 3.

6.1.6 Cover Design

Callide Mine does not generate tailings or rejects and does not have any tailings or rejects storage facilities. The geochemistry of overburden at Callide Mine is benign (Section 6.1.4 – Waste Characterisation) and does not require a cover to manage the overburden geochemistry.

6.1.7 Water Management

The Callide Mine closure landform is designed to meet the nominated PMLU and NUMA milestone criteria without ongoing active water management or dewatering. Post mining, the final landforms will generate the following waters:

- Final void water comprising runoff from final void catchments and any groundwater inflows to final voids;
- Runoff from rehabilitated overburden emplacement areas; and
- Runoff from rehabilitated mine infrastructure areas.

A final void water balance assessment was completed as part of the PRCP and is provided in the *Final Void Water Balance Report* (Appendix E). This will be updated in parallel with the Groundwater Study report, detailed in Section 6.1.2.

The final void water balance assessment submitted with the draft PRCP in 2023 concluded that all final voids in the final landform would have sufficient capacity to contain accumulated void water, with nil overflow, in the long-term post mine closure. The assessment included modelling of final void lake salinity in the post-mining phase, and concluded that void lake salinity is likely to increase due to evaporative concentration over time. However, containment of the void lake water within the void would prevent any potential contamination to surface water.

As discussed in Section 6.3.1, the final landform of the rehabilitated overburden emplacement and mine infrastructure areas will be shaped with stable slopes generally up to 15% to achieve free drainage.

In addition, the rehabilitation completion criteria include required water quality limits to be achieved for runoff from all rehabilitated areas. These measures are designed to ensure effective control of erosion, and to ensure there is no potential contamination of surface water from runoff from rehabilitated areas.

6.1.7.1 Contaminants and sources

Since mining operations commenced at Callide Mine in the 1940s, heavy industrial activities including the operation and maintenance of coal handling facilities, mobile equipment, workshops, fuel storage areas and other supporting infrastructure, have occurred across the site. These activities have involved the storage, handling, use and disposal of a range of hazardous materials.

Callide Mine infrastructure and operational practices have evolved over time in response to modern engineering, safety and environmental standards. However, the long duration of these associated industrial activities increase the likelihood that areas of contaminated land may be present at the time of closure. It is therefore considered likely that some areas of land contamination will be present at closure and will require investigation and, where necessary, remediation and/or ongoing management.

In accordance with the requirements of the EP Act and the EA, areas of identified land contamination that present an unacceptable risk to human health or environmental values during operations will be subject to investigation and remediation, where appropriate. Remediation works will be undertaken to render the land suitable for the intended PMLU.

The predominant hazardous materials identified as having the potential to cause land contamination at Callide Mine, and potentially impact PMLUs and/or the receiving environment, include:

- Hydrocarbons: including diesel, lubricating oils, greases and solvents associated with the operation and maintenance of mobile equipment, fixed plant and fuel storage infrastructure;
- Aqueous Film-Forming Foam (AFFF): historical use of firefighting foams containing per- and polyfluoroalkyl substances (PFAS);
- Explosives-related compounds: including nitrogen-based constituents associated with blasting activities; and
- Carbonaceous materials: including coal and coal fines.

Contaminated land investigations will be undertaken to assess areas for potential contamination (RM2). This investigation will assess the range of potential contaminants that are utilised or generated during operations and will provide an assessment of the risk presented to achievement of the PMLUs and the receiving environment.

6.1.8 Revegetation

6.1.8.1 Revegetation Objectives

The revegetation objectives of the planned bushland, grazing or watercourse PMLU are consistent with the rehabilitation milestones criteria:

- Bushland (RM9):
    - Achieve <25% bare ground
    - Establishment of vegetation with native species richness of 3 (pre-1998 rehabilitation areas) and 4 (post-1998). Achieve a minimum of 50% of trees are healthy and growing for pre-1998 revegetation areas, and 80% of trees (aside from short-lived acacias) are healthy and growing for post-1998 rehabilitation.
    - Rehabilitation completed after the approval of PRCP meets the BioCondition Benchmark scores as described in the schedule's Table 5
- Grazing (RM10):
    - Achieve total groundcover of >70%, of which >50% is vegetative cover consisting of 3P pasture species
    - Establishment of cattle grazing pasture with land suitability class <3
- Watercourse (engineered diversion) (RM11):
    - Relinquishment of Water License 105184 for the Oaky Creek Diversion
    - Certification by AQP confirming that the Trap Gully diversion is stable

There are no revegetation objectives for the planned NUMAs. The above revegetation objectives for groundcover consider groundcover to be anything in contact with the soil surface, such as live cover, standing dry cover, organic matter (leaf litter, hay, woody debris) or rocks.

6.1.8.2 Revegetation seed provenance

The provenance of seed stock (where the seed is sourced) is an important consideration for all species proposed for rehabilitation activities. While appropriate provenance boundaries may vary between individual species, the preferred source of seed is the Brigalow Belt South Bioregion, to ensure genetic suitability and maximise ecological resilience of the rehabilitated areas.

Proof of provenance will be sought from the seed suppliers, along with germination and viability certificates for purchased seeds. These measures ensure that seed used in rehabilitation is both ecologically appropriate and meets minimum quality standards.

6.1.8.3 Bushland revegetation species and seeding rates

Areas of bushland PMLU are proposed on landforms associated with spoil dumps (RA3) and mine infrastructure areas (RA4).

Rehabilitation of these areas will aim to establish a self-sustaining vegetation community that is compatible with the surrounding landscape and reflective of the REs occurring within and adjacent to the Callide Mine.

The rehabilitated bushland areas are intended to be stable, non-polluting and safe, and to support ecological values (including fauna habitat) consistent with the approved PMLU completion criteria. Species selection and revegetation methods will be informed by local reference site data where available (Table 33), and will aim to achieve an appropriate vegetation structure, species composition, and ecosystem function over time. Although there is a range of REs surrounding Callide Mine (Section 2.8), RE 11.10.13 - *Eucalyptus spp. and/or Corymbia spp. open forest on scarps and sandstone tablelands* will be used to inform the bushland habitat rehabilitation objectives for spoil landforms.

This RE was selected alongside advice from a DETSI ecologist, identifying that this RE had compatible soil, species, and structure traits with the available inputs from Callide Mine. REs are compatible with Callide Mine rehabilitation if they occur in the surrounds of Callide Mine, and they are associated with hilly/rocky terrains, low fertility substrates, and an open woodland structure. For rehabilitation areas RA3 and RA4 at the Callide Mine, the woodland habitat revegetation strategy includes the application of seed mixes at indicative rates of 6 kg/ha for tree species, 4 kg/ha for woody understorey species, and 10 kg/ha for native grasses and forbs.

To support the rapid establishment of initial groundcover and minimise erosion risk, a sterile cover crop (e.g. Japanese millet or similar non-persistent species) will be included at an application rate of approximately 5 kg/ha. These will be the only non-native species utilised, as the focus will be to generate the presence of native species to allow the area to be comparable to RE 11.10.13.

Seed availability may vary between seasons; however, seed mixes will be designed to maintain appropriate species diversity. As a minimum, the revegetation mix will include no fewer than six species from each primary vegetation stratum (i.e. tree species, woody understorey species and grasses), consistent with the species listed in Table 18, and applied to the overall target seeding rates. Species from RE 11.10.1 will be considered first for addition when required, as this ecosystem merges with 11.10.13. It is noted that RE 11.10.1 includes species with comparatively greater commercial seed availability due to the relative ease of collection, supporting their use in rehabilitation.

Revegetation species selection and seeding rates may be refined over time by an AQP, informed by the results of monitoring and performance assessments, to support continuous improvement and ensure the achievement of the approved bushland PMLU and associated completion criteria.

The preferred seeding timing is before the onset of the wet season (i.e. in September/October). This allows the seed the best chance of striking, as soil moisture will be at its highest in the late wet season. Seeding will be undertaken utilising either an agricultural-class tractor or small dozer with a spreader, or aerially via drone.

Topsoil requirements (i.e. presence on site, required depth for successful rehabilitation and any required amelioration) are discussed in Section 6.1.4.1.

Table 18: Recommended species list and seeding rates for Bushland PMLU

Common Name	**Scientific Name**	**Seed rates (kg/ha - (uncoated weight)**
Tree Species		
Narrow-leaved ironbark	*Eucalyptus crebra*	0.2-0.5
Silver-leaved ironbark	*Eucalyptus melanophloia*	0.2-0.5
Spotted gum	*Corymbia citriodora*	0.3-1
Moreton bay ash	*Corymbia tessellaris*	0.2-0.5
Queensland peppermint	*Eucalyptus exserta*	0.2-0.5
Gum-topped box	*Eucalyptus moluccana*	0.2-0.5
Brown bloodwood	*Corymbia trachyphloia*	0.1-0.5
Red bloodwood	*Corymbia erythrophloia*	0.1-0.5
Rusty gum	*Angophora leiocarpa*	0.2-0.5
Black cypress pine	*Callitris endlicheri*	0.2-0.5
Pink bloodwood	*Corymbia intermedia*	0.1-0.5
Dead finish	*Eucalyptus cloeziana*	0.2-0.5
Tree Species – total seed weight (uncoated)		6
Woody understory species		
Quinine bush	*Petalostigma pubsescens*	0.2-0.5
Soap bush	*Alphitonia excelsa*	0.2-0.5
False Sandalwood	*Eremophila mitchellii*	0.2-0.5
Dogs balls / emu berry	*Grewia latifolia*	0.3-1
Broadleaf hopbush	*Dodonaea viscosa*	0.2-0.5
Bitterbark	*Alstonia constricta*	0.2-0.5
Crow's apple	*Owenia venosa*	0.5-1
Lightwood / hickory wattle	*Acacia implexa*	0.2-0.3
Pretty wattle	*Acacia decora*	0.2-0.3
Bancroft's wattle	*Acacia bancroftiorum*	0.2-0.3
Mountain hickory wattle	*Acacia penninervis subsp. penninervis*	0.2-0.3
Triangle-leaved hopbush	*Dodonaea triangularis*	0.1-0.3
Stony ridge wattle	*Acacia semirigida*	0.2-0.3
Netted hopbush	*Dodonaea stenophylla*	0.1-0.3
Dogwood	*Jacksonia scoparia*	0.1-0.3
Scrub ironbark / rosewood	*Acacia fasciculifera*	0.1-0.3
Curracabah	*Acacia crassa*	0.2-0.3
Red wattle, yellow wattle	*Acacia flavescens*	0.2-0.3
Hickory wattle	*Acacia glaucocarpa*	0.2-0.3
Slender flower wattle	*Acacia longispicata*	0.2-0.3
Thread-leaved hop bush	*Dodonaea filifolia*	0.1-0.3
Stalked hop bush	*Dodonaea peduncularis*	0.1-0.3

	Dodonaea vestita	0.1-0.3
Pomax	*Pomax umbellata*	0.1-0.3
	Daviesia filipes	0.1-0.3
Cough bush	*Cassinia laevis*	0.1-0.3
Woody understory species – total seed weight (uncoated)		4
Grass Species		
Black spear grass	*Heteropogon contortus*	0.2-2
Clustered lovegrass	*Eragrostis elongata*	0.05-0.1
Granite lovegrass	*Eragrostis alveiformis*	0.05-0.1
Brown's lovegrass	*Eragrostis brownii*	0.05-0.1
Purple lovegrass	*Eragrostis lacunaria*	0.05-0.1
Paddock lovegrass	*Eragrostis leptostachya*	0.05-0.1
Weeping lovegrass	*Eragrostis parviflora*	0.05-0.1
Woodland lovegrass	*Eragrostis sororia*	0.05-0.1
Kangaroo grass	*Themeda triandra*	0.5-2
Queensland bluegrass	*Dicanthium sericeum*	0.3-2
Pitted blue grass	*Bothriochloa decipiens*	0.2-0.5
Barbed-wire grass	*Cymbopogon refractus*	0.1-0.3
Three awned spear grass (co-habitant species)	*Aristida spp. (i.e. A.calycina, A latifolia, A.ramosa, A. caput-medusae, A.jerichoensis, A.personata, A. calycina*	0.2-1
Hairy millet/Hairy panic	*Panicum effusum*	0.05-0.1
Many headed wiregrass	*Aristida caputmedusae*	0.2-1
Three-awned speargrass	*Aristida vagans*	0.2-1
Forked fimbry	*Fimbristylis dichotoma*	0.1-0.2
Native millet	*Panicum decompositum*	0.3-0.5
Grass species – total seed weight (uncoated)		10
Rapid groundcover establishment species		
Japanese millet	*Echinochloa esculenta*	5

6.1.8.4 Grazing revegetation species and seeding rates

The grazing PMLU is predominantly planned for lower gradient areas disturbed by mining activities, areas that require shallow-rooted species, and/or areas where there was significant clearing prior to mining. Revegetation will be undertaken using a native and naturalised exotic species mix designed to establish a productive, persistent and sustainable pasture system that aligns with both the rehabilitation objectives of the PRCP and the requirements of long-term grazing viability. The target is to establish groundcover dominated by productive, perennial and palatable (3) pasture species and legumes cognisant of grazing best management practices (Future Beef 2022).

Species selection will be guided by the list presented in Table 19, which has been developed from regional pasture recommendations, suitability to the soil management groups described in Section 2.6.1, historical seed selections at Callide Mine, and species known to deliver successful outcomes in past rehabilitation programs. All seed mixes will also include Japanese millet (*Echinochloa esculenta*) or similar as a sterile cover crop to protect soils from erosion. The cover crop will establish quickly on exposed surfaces to provide ground cover and a root system that will stabilise the surface and prevent erosion until the preferred (3P) species have established.

Though the availability of species may vary, at least four 3P grass species and two legumes listed in Table 19 are required for grazing PMLU. An AQP may adjust the seed mix composition and seeding rates based on the results of ongoing rehabilitation monitoring (Section 9.1)

The Grazing PLMU seed mixes are recommended to be sown during the warmer months, September to March, when the probability of rainfall is high, and soil temperature is sufficient for seed germination.

Topsoil requirements (i.e. presence on site, required depth for successful rehabilitation and any required amelioration) are discussed in Section 6.1.4.

Table 19: Recommended species list and seeding rates for the Grazing PMLU

Common name	Scientific name	Sowing rate (kg/ha)
Grass species		
Forest bluegrass	*Bothriochloa bladhii*	4[c]
Bisset creeping bluegrass	*Bothriochloa insculpta* cvv. Bisset*	4[c]
Callide Rhodes grass	*Chloris gayana cvv. Callide**	4[c]
Katambora Rhodes grass	*Chloris gayana cvv. Katambora**	4[c]
Queensland bluegrass	*Dichanthium sericeum subsp. sericeum*	4[c]
Purple pigeon	*Setaria incrassata**	4[c]
Black spear grass	*Heteropogon contortus*	4
Kangaroo grass	*Themeda triandra*	2
Grass species – total seed weight (coated)		16
Legume species		
Wynn Cassia	*Chaemacrista rotundifolia*	2
Butterfly pea	*Clitoria ternatea*	2
Burgundy bean	*Macroptilium bracteatum**	2
Caatinga Stylo	*Stylosanthes seabrana cvv. caatinga*	2
Shrubby Stylo	*Stylosanthes hamata**	2
Rhynchosia	*Rhynchosia minima var. australis*	2
Rhynchosia	*Rhynchosia minima var. minima*	2
Legume species – total seed weight (uncoated)		4
Rapid groundcover establishment species		
Japanese millet	*Echinochloa esculenta*	5
c Assumes seed is coated. If not coated, use half prescribed rate; * Naturalised exotic species		

6.1.8.5 Watercourse revegetation species and seeding rates

Revegetation of areas assigned to the Watercourse (Engineered Diversion) PMLU will be undertaken with the objective of reestablishing stable, self-sustaining riparian vegetation communities that provide hydraulic stability, erosion control and habitat function. The species will be consistent with the predominant natural watercourse occurring on Callide Mine - RE 11.3.25 – *Eucalyptus tereticornis woodland along rivers and streams.*

The watercourse (engineered diversion) PMLU revegetation activities will be implemented in the following areas:

- Existing creek diversions requiring additional revegetation activities
- Natural watercourses or drainage lines which have been disturbed by mining activities
- Future water diversions

The recommended watercourse revegetation species and seeding rates are listed in Table 20 and Table 21.

The planned total seeding rate for the upper and mid banks is 20 kg/ha, comprising 6 kg/ha of uncoated tree species, 4 kg/ha of uncoated woody understory species and 10 kg/ha of uncoated groundcover species.

The revegetation on lower banks is designed to establish a higher percentage of groundcover, such as grasses, rushes and sedges. Only non-aggressive grass species have been recommended, with competitive grass species excluded from the mix. The planned seeding rate for the lower banks is a total of 15 kg/ha, comprising 5 kg/ha uncoated tree species and 10 kg/ha uncoated groundcover species.

The addition of a sterile cover crop (e.g., Japanese millet or similar) seeded at 5 kg/ha will provide initial ground cover for all revegetation zones.

Table 20: Recommended species to be established for the Watercourse PMLU – upper and mid banks

Common Name	**Scientific Name**	**Seed rates (kg/ha - (uncoated weight)**
Tree Species		
Belah	*Casuarina cristata*	0.5 - 1
River she oak	*Casuarina cunninghamiana*	0.5 – 1
Moreton Bay ash	*Corymbia tessellaris*	0.5 – 1
River red gum	*Eucalyptus camaldulensis subsp. obtusa*	1 - 2
Silver-leaved ironbark	*Eucalyptus melanophloia*	0.5 – 1
Queensland blue gum	*Eucalyptus tereticornis* subsp. *tereticornis*	0.5 - 1
Tree Species – total seed weight (uncoated)		6
Woody understory species		
Leichardt bean	*Cassia brewsteri*	0.5 - 1
Broadleaf hopbush	*Dodonaea viscosa*	0.5 - 1
False sandalwood	*Eremophila mitchellii*	0.5 - 1
Beefwood	*Grevillea striata*	0.5 - 1

Common Name	Scientific Name	Seed rates (kg/ha - (uncoated weight)
Sandpaper fig	*Ficus opposita*	0.5 - 1
White sandpaper fig	*Ficus fraseri*	0.5 - 1
Creek sandpaper fig	*Ficus coronata*	0.5 - 1
Quinine bush	*Petalostigma pubsescens*	0.5 - 1
Dogs balls / emu berry	*Grewia latifolia*	0.5 - 1
Ironwood wattle	*Acacia excelsa*	0.5 - 1
Woody understory species – total seed weight (uncoated)		4
Ground Species		
Forest Bluegrass	*Bothriochloa bladhii*	1 - 2
Queensland Bluegrass	*Dichanthium sericeum*	2 - 3
Black Speargrass	*Heteropogon contortus*	1 - 2
Rhynchosia	*Rhynchosia minima var. minima*	1 - 2
Kangaroo Grass	*Themeda triandra*	2 - 3
Slender Chloris	*Chloris divaricata*	1 - 2
Pitted blue grass	*Bothriochloa decipiens*	1 - 2
Spiked Sida	*Sida hackettiana*	2 - 3
Woolly Glycine	*Glycine tomentella*	1 - 2
Lesser Joyweed	*Alternanthera denticulate*	1 - 2
Native Sensitive Plant	*Neptunia gracilis*	1 - 2
Hairy millet/Hairy panic	*Panicum effusum*	1 - 2
Grass species – total seed weight (uncoated)		10

Note: Where seed for a specific species is not available in sufficient quality or quantity as listed in this table, it will be supplemented with the equivalent weight of a comparable native species from the technical descriptions for RE 11.3.4.

Table 21: Recommended species to be established for the Watercourse PMLU – lower banks

Common Name	Scientific Name	Seed rates (kg/ha - (uncoated weight)
Tree Species		
River oak	*Casuarina cunninghamiana subsp. Cunninghamiana*	0.5 - 1
Silver-leaved ironbark	*Eucalyptus melanophloia*	0.5 - 1
Moreton Bay ash	*Corymbia tessellaris**	0.5 - 1
Queensland blue gum	*Eucalyptus tereticornis subsp. tereticornis**	0.5 - 1
Red bottlebrush	*Melaleuca viminalis**	0.5 - 1
Broad-leaved tea tree	*Melaleuca leucadendra**	0.5 - 1
Weeping tea-tree	*Melaleuca fluviatilis*	0.5 - 1
Tree Species – total seed weight (uncoated)		5
Groundcover Species		
Rushes and Sedges		
Vetiver Grass (sterile)	*Chrysopogon zizanioides*	2
Tall Flat Sedge	*Cyperus exaltatus*	1
Sticky Sedge	*Cyperus fulvus*	1
Slender Flat-Sedge	*Cyperus gracilis*	1
Pale Spike Rush	*Eleocharis pallens*	1
Spiny Head Matt-Rush	*Lomandra longifolia*	1
Grass Species		
Forest Bluegrass	*Bothriochloa bladhii*	2
Queensland Bluegrass	*Dichanthium sericeum*	2.5
Black Speargrass	*Heteropogon contortus*	1
Barbwire grass	*Cymbopogon refractus*	2
Kangaroo Grass	*Themeda triandra*	2.5
Slender Chloris	*Chloris divaricata*	1
Pitted bluegrass	*Bothriochloa decipiens*	1
Groundcover species – total seed weight (uncoated)		10

Note: Where seed for a specific species is not available in sufficient quality or quantity as listed in this table, it will be supplemented with the equivalent weight of a comparable native species from the technical descriptions for RE 11.3.4.

Visual monitoring of the revegetation will commence within one month of seed application. Within 12 months of seeding, a determination can be made as to whether sufficient germination from the initial seeding has occurred, or if re-seeding is required. Formal monitoring of revegetated areas will commence after a typical wet season has passed, following completion of the revegetation works (Section 9).

Weed management will also be undertaken during the establishment of revegetation and based on the results of rehabilitation monitoring, in accordance with the rehabilitation monitoring and maintenance program (Section 9).

6.2 Tailings Storage Facilities

Callide Mine does not have a wash plant and does not produce any tailings. Hence, there are no tailings storage facilities on the mine site.

6.3 Voids

Under the transitional provisions of the EP Act, NUMAs that have been previously addressed in a LOD can be transitioned into a PRCP schedule. As detailed in Section 5, the residual voids at Callide Mine are pre-approved NUMAs in accordance with the Callide Mine EA conditions F8 and F9.

The Callide Mine EA condition F8 provides final landform design criteria and requirements for residual void NUMAs for:

- Boundary Hill (excluding Boundary Hill South),
- Dunn Creek,
- Trap Gully and
- The Hut

The Callide Mine EA condition F9 specifies the rehabilitation requirements, location and area of the residual void NUMA at Boundary Hill South.

The location and 3-dimensional landforms of the final void NUMAs within the Callide Mine MLs are shown in Figure 21 to Figure 24.

The areas of the final voids have been minimised as far as possible in the development of the final landform design. The location and extent of the final voids are governed by the location of the coal resource, the existing ML boundaries, the topography and the overburden emplacement final landform design criteria.

There are no floodplains (defined in section 41C of the EP Regulation) within the Callide Mine MLs, as there are no watercourses with a stream of 4 or higher under the Strahler stream order classification system within the ML area. Consequently, none of the proposed final voids are located within a floodplain.

The required management measures for the final voids and associated ramps are specified in EA Conditions F8 and F9 and are consistent with best practice management measures commonly applied to final voids in the Central Queensland coal mining industry. EA conditions F8 and F9 also include acceptance criteria for final voids that have been adopted in the management methods and completion criteria.

6.3.1 Geotechnical Stability

The open-cut mine final voids will be left in a safe, geotechnically stable form and at slopes that comply with the relevant Callide Mine EA landform criteria (Table 17). Highwalls are required to be at 75 degrees, and low walls and ramps will generally be left at the angle of repose. Any final highwall benches will have contour drains installed to limit the drainage points over the highwall. Access to highwalls will be prevented by the installation of bunds along the final highwall and along the crest of the highwall benches. Warning signs will also be installed along the final highwall.

An assessment of the final void NUMA slopes in comparison to the residual final void design outcomes specified in EA Table F3 is included in the Final Landform Slope Assessment (Appendix F). The assessment indicates that the slopes generally satisfy the design criteria. Further work is not recommended at this stage for a number of isolated areas where the design criteria is not met.

6.3.2 Void Hydrology

6.3.2.1 Water Balance

A final void water balance assessment was completed for the 2023 PRCP submission and is included in the Final Void Hydrology Assessment (Appendix E). The assessment included all final voids in the (Figure 17 to 20) and involved modelling of the long-term post-mining final void lake levels. The modelling was based on the final void catchment areas and geometry, and daily rainfall data. It also included groundwater inflow volumes generated by the PRCP groundwater model (refer to the Groundwater Report, Appendix D).

The final void hydrology assessment will be updated in parallel with the Groundwater Study report, detailed in Section 6.1.2.

6.3.2.2 Groundwater modelling

The initial groundwater modelling for the draft PRCP predicted that some of the final void lakes may form groundwater sources post mining, which was unexpected and contrary to the findings of all previous final void groundwater assessments undertaken at Callide Mine. All previous Callide Mine final void assessments had concluded that all final voids would function as groundwater sinks following mine closure. In 2025, post-closure predictions were re-run using Batchfire's updated 2023 site-wide groundwater model to confirm whether residual voids are predicted to function as groundwater sinks or exhibit flow-through conditions.

Since that time, updated final landform designs have been developed, and an updated PRCP groundwater report will be prepared following approval of the Rehabilitation Schedule, incorporating the revised landform design and updated modelling outputs.

To improve the accuracy of the Callide Mine groundwater model and confirm the validity of the current post-mining predictions, Batchfire commenced an extensive PRCP groundwater field investigation program. The PRCP groundwater field investigation included:

- Drilling and constructing a total of 12 groundwater monitoring bores and vibrating wire piezometer arrays that target key areas in and around the final voids; and
- Undertaking detailed surveys of the existing final voids and the associated geology.

This PRCP groundwater field investigation will form part of the broader groundwater investigation program, and data collected from the PRCP groundwater field investigation program will improve the accuracy of the groundwater characterisation. This will assist with characterisation of groundwater levels and geological information (particularly final void geometry and coal seam levels) in the vicinity of the final void lakes.

Overall, following the remodelling of the final void lake groundwater impacts and (where necessary), the development of final void lake management measures, the final voids are not expected to give rise to any significant environmental harm.

6.3.2.3 Water Quality

Final void water quality will be assessed and addressed in the updated Final Void Hydrogeological Assessment.

6.4 Underground Mining

Callide Mine does not conduct any underground mining.

6.5 Built Infrastructure

Built Infrastructure (Table 22) will be demolished and removed, except where it is agreed upon to be retained in an executed landholder agreement if it's been determined to be beneficial to either bushland or grazing PMLU. The Infrastructure Retention Statement, signed by Batchfire the landholder is attached in Appendix J. One water structure is not on Batchfire owned land and is situated on land owned by C E Polsen (Figure 15b). An agreement for the transfer of ownership of the dam to Mr Polsen is in place for the relinquishment of the ML (Appendix J). All other retained infrastructure is situated on land owned by Batchfire. As such, an agreement is in place to confirm the retention, but no transfer of ownership agreement is required. The location of the retained infrastructure are shown in Figures 17 to 20.

Infrastructure that was not constructed for mining purposes, e.g. fences and gates, access tracks, fire breaks, will not be removed as part of the decommissioning and rehabilitation process.

The remaining infrastructure will be decommissioned and/or removed at the end of the mining operations, with the timing based on the proposed timing of the Callide mine operation, final mining and rehabilitation activities.

A detailed inventory of all mine site infrastructure items that will be decommissioned and/or removed is maintained for the preparation of the Estimated Rehabilitation Cost (ERC) Application, which also includes detailed descriptions of the decommissioning and rehabilitation method.

Table 22: Infrastructure associated with the approved Callide mine activities

Category		Infrastructure
Built Infrastructure	Steel, concrete and brick infrastructure	• Vehicle wash bays • Refuelling infrastructure • Water tanks • Waterfill points • Coal Handling Plant infrastructure (e.g., train load out, hopper bins, conveyors) • Fuel and lubricant tanks • Buildings (e.g. crib rooms, bathhouse, warehouse, workshop, administration) • Sewage Treatment Plants
	Supporting services	• Pipelines (overground and underground) • Communication and lighting towers • Pumps • Powerlines • Switchyards and substations • Magazines and explosives storage compounds • Hardstand areas and laydown pads
Water Infrastructure		• Mine affected water dams • Sediment dams • Drains

Where infrastructure is held by a third-party it will remain in situ, under the management of that party. Such infrastructure is identified in Figure 17 to 20 and may include electrical substations, rail lines and rail loading infrastructure, and public roads.

6.5.1.1 Waste and Resource Management

Priority will be given to repurposing, salvaging, or recycling materials. Demolition and disposal will only occur where reuse or recycling options are not considered viable. This approach is consistent with the waste and resource management hierarchy under the *Queensland Waste Management and Resource Recovery Strategy*, prepared in accordance with the *Queensland Waste Reduction and Recycling Act 2011*.

6.5.1.2 Scrap tyres

In accordance with EA conditions H3 and H4:

- EA Condition H3 states that "*Disposing of scrap tyres resulting from the mining activities in spoil emplacements is acceptable, provided tyres are placed as deep in the spoil as possible but not directly on the pit floor"*
- EA Condition H4 requires that "*Scrap tyres resulting from the mining activities disposed within the operational land must not impede saturated aquifers and compromise the stability of the consolidated landform"*

Where scrap tyres remain at the cessation of mining operations, these will be disposed of within overburden emplacement areas in accordance with above EA conditions. Tyres will be placed above the pit floor and outside of zones that may interact with saturated aquifers, and will be encapsulated within the spoil profile during landform reconstruction to ensure long-term geotechnical stability and environmental protection.

6.5.1.3 Built infrastructure

Decommissioning of built infrastructure that does not provide a beneficial use to the nominated PMLU will include the following actions:

- Disconnecting services;
- Removing above-ground infrastructure and services through salvage or recycling, or demolishing and disposing of materials within approved mine voids or spoil dumps;
- Removing below-ground infrastructure and services to a minimum depth of 0.5 m below the final landform surface and recycling, disposing of within approved mine voids or spoil dumps, or covering to a minimum depth of 0.5 m to enable establishment of the PMLUs;
- Removing concrete, bitumen, and aggregate to a minimum depth of 0.5 m below the final landform surface and recycling, disposing of within approved mine voids or spoil dumps, or covering to a minimum depth of 0.5 m to enable establishment of the PMLUs; and
- Disposing of demolition-related putrescible and hazardous wastes at an appropriately licensed facility.

Below-ground infrastructure, services, and waste located deeper than 0.5 m below the final landform surface may be retained, provided the following criteria are met:

- Pipelines have been drained and made safe; and
- Below-ground infrastructure installed after approval of this transitional PRCP is appropriately recorded and mapped.

6.5.2 Water Infrastructure

Decommissioning of the water-related infrastructure constructed for the mining activities with no beneficial use to the PMLU will include:

- Pumping any remaining water to the residual voids, or removing water in accordance with:
    - EA Condition C23: *Mine affected water may be piped or trucked or transferred by some other means that does not contravene the conditions of this environmental authority and deposited into artificial water storage structures, such as farm dams or tanks, or used directly at properties owned by the environmental authority holder or a third party (with the consent of the third party)*
- Disposing or covering of mine dam sediment according to the results of an assessment by an AQP;
- Breaching mine dam walls and reshaping of the area to make it free-draining; and
- Removing culverts and drains constructed for mining activities and operations.

6.5.3 Contaminated Land Assessment

In accordance with the EA conditions, contaminants must not be released in a manner that constitutes environmental harm, and spillage of any waste, contaminants or other materials must be cleaned up as quickly as practicable, stored in accordance with relevant standards and handled in a way that prevents environmental harm.

At completion of mining operations and prior to landform reshaping, surface preparation and revegetation, a contaminated land investigation will be undertaken in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (RM2) of the relevant RAs. To support the assessment of contaminated land risk of individual progressive rehabilitation areas, the contaminated land investigations will be completed by suitably qualified persons (SQP) to a standard that can be used as support of a future EP Act compliant Contaminated Land Investigation Document.

Prior to the relinquishment of the mining leases, the progressive rehabilitation contaminated land investigations can be collated to produce an EP Act compliant Contaminated Land Investigation Document that will be used to confirm the suitability of the site for the PMLUs and to amend Environmental Management Register listings or to submit Site Management Plans where required.

7 Risk Assessment

7.1 Identifying, assessing and treating risks

7.1.1 Risk Methodology

A risk-based approach has been applied to the Callide Mine PRCP, following the method in Figure 25 below.

The risk assessment was conducted generally in accordance with the Australian Standard ISO 31000:2018 Risk Management – Guidelines (Standards Australia, 2018).

Figure 25: ISO 31000-compliant risk-based approach to the Callide Mine PRCP.

7.1.2 Risk identification

Batchfire conducted a PRCP risk assessment to identify two risk events:

- A stable condition for land described as a PMLU is not achieved, and to identify existing and any additional risk management measures required; and
- A NUMA causing environmental harm and not being safe and structurally stable, and to identify existing and any additional management measures required.

The full risk assessment - *Batchfire PRCP Risk Assessment* is included in Appendix G and provides the initial risk assessment, risk evaluation, control measures and residual risk for each risk scenario.

Worst-case outcomes were assessed for each scenario, and preventative controls to manage that risk were identified, followed by a residual risk rating.

The Batchfire risk matrix was used to assess the level of risk with certain events. The risk matrix considers the consequence and likelihood of each event (Table 23.)

Table 23: Batchfire Risk Matrix

Loss Type		Hazard Effect / Consequence (Where an event has more than one 'Loss Type', choose the 'Consequence' with the highest rating)				
		1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
Harm to People (Safety & Health)		Report Only	First Aid Injury / Exposure to minor health risk	MTI / LTI / Reversible impact on health	Single fatality or loss of quality of life / Irreversible impact on health	Multiple fatalities / Impact on health ultimately fatal
Environmental Impact		Minimal environmental harm	Material environmental harm – incident remediable short term	Serious environmental harm – incident remediable within LOM. Prosecution unlikely	Major environmental harm – incident remediable post LOM. Prosecution likely	Extreme environmental harm –incident irreversible. License revoked
Loss of EBIT		Up to $0.1M	$0.1M to $1.0M	$1.0M to $5.0M	$5M to $20M	>$20M
Business Interruption		Minor service disruption	Business Interruption up to 3 days	Business Interruption 3 - 10 days	Business Interruption 10 days to 1 month	Business Interruption > 1 month
Impact on Reputation		No public concern	Local public concern	Regional public concern	National impact - National public concern	International attention
Likelihood	Examples (Consider near hits as well as actual events)	Risk Rating				
5 (Almost Certain)	Likely to occur within 1 year	MODERATE – 11(M)	SIGNIFICANT – 16 (S)	SIGNIFICANT – 20 (S)	HIGH – 23 (H)	HIGH – 25 (H)
4 (Likely)	The event could occur between 1-5 year timeframe	MODERATE – 7 (M)	MODERATE – 12 (M)	SIGNIFICANT – 17 (S)	HIGH – 21 (H)	HIGH – 24 (H)
3 (Possible)	The event could occur between 5-10 year timeframe	LOW – 4 (L)	MODERATE – 8 (M)	SIGNIFICANT – 13 (S)	SIGNIFICANT – 18 (S)	HIGH – 22 (H)
2 (Unlikely)	The event could occur between 10-20 year timeframe	LOW – 2 (L)	LOW – 5 (L)	MODERATE – 9 (M)	SIGNIFICANT – 14 (S)	SIGNIFICANT – 19 (S)
1 (Rare)	The event is highly unlikely to occur within 20 years	LOW – 1 (L)	LOW – 3 (L)	MODERATE – 6 (M)	MODERATE – 10 (M)	SIGNIFICANT – 15 (S)
Risk Level	Guidelines for Risk Matrix					
	Job Safety Analysis (JRA)			Workplace Risk Assessment Control (WRAC)		
HIGH	The activity/task is not to proceed without GM/SSE approval for H&S / Environmental risks or CEO approval for Loss of EBIT / Business Interruption / Reputation risks			The activity/task is not to proceed without GM/SSE approval for H&S / Environmental risks or CEO approval for Loss of EBIT / Business Interruption / Reputation risks		
SIGNIFICANT	The activity/task is not to proceed without Department Manager approval			The activity/task is not to proceed without Department Manager approval		
MODERATE	The activity/task may proceed with caution once the Area Supervisor has approved			Low-Moderate risks require Superintendent sign off.		
LOW						

7.1.3 Summary of Key Closure Risks

The risk assessment outlined in Appendix G acknowledged a total of 22 risks identified, with the assessment finding that no high or significant residual risks remained. Ten medium risks and 12 low risks were classified in accordance with the risk matrix.

7.1.4 Risk Treatment Plan

A Risk Treatment Plan to achieve a stable condition for the PMLUs (Table 24) and to achieve a safe and structurally stable NUMA that does not cause environmental harm (Table 25) has been developed for the risks identified in the risk assessment and includes the following:

- The reasons for selecting the treatment option.
- Those responsible for the approval and implementation of the plan.
- Proposed actions.
- Resource requirements.
- Performance measures and constraints.
- Reporting and monitoring requirements and
- Timing and scheduling.

Table 24: Necessary risk treatments identified to achieve a stable condition for the PMLUs

Aspect	Risk Treatment
Risk Event 1: Does not achieve safe and stable for humans and wildlife, able to sustain vegetation, non-polluting condition	
Reasons for selecting the treatment option	– Ongoing studies and analysis to continue to the end of mine life to demonstrate and confirm that these treatments achieve a stable condition for the proposed closure landform
Responsibility for plan: – Approval – Implementation	– Technical Services – Site operations
Proposed actions	– Material characterisation – Selective handling of materials for placement – Growth media assessment to determine ameliorant and physical treatment requirements – Landform is designed for materials available on-site and what can be achieved based on their properties – PMLU selected based on what is most appropriate for landform and materials – Groundcover of vegetation and rock mulch (where appropriate on slopes) to provide erosion resistance – Rehabilitation monitoring and maintenance
Resource requirements	– Available material inventory – Erosion modelling – Equipment capabilities

Aspect	Risk Treatment
	– Survey – Rehabilitation monitoring – Growth media assessment – Stockpile materials (i.e. rock) if required
Performance measures and constraints	– Comparison against design – Tracking against milestone criteria
Reporting and monitoring	– Rehabilitation monitoring
Risk timing and scheduling	– From the commencement of rehabilitation activities to the final achievement of PMLU
Risk Event 2: Spoil dumps do not reach a stable condition consistent with the selected PMLU	
Reasons for selecting the treatment option	– Ongoing studies and analysis to continue to the end of mine life to demonstrate and confirm that these treatments achieve a stable condition for the proposed closure landform
Responsibility for the plan: – Approval – Implementation	– Technical Services – Environment team – Site operations – Project team
Proposed actions	– Management of topsoil and rock stockpiling – Management of rehabilitation material application – Review of the growth media and rock resource quantities periodically during operations – Growth media assessment to determine ameliorant and fertiliser requirements – Application of ameliorants, surface treatments as per assessment – Management of seed selection, provenance and quality – Revegetation species aligned to growth media, landforms and PMLU – Rehabilitation monitoring and maintenance
Resource requirements	– Topsoil and rock inventory – Survey – Rehabilitation monitoring and maintenance – Growth media assessment
Performance measures and constraints	– Tracking against milestone criteria
Reporting and monitoring	– Rehabilitation and reference site monitoring
Risk timing and scheduling	– From planning of topsoil stripping to final achievement of PMLU

Aspect	Risk Treatment
Risk Event 3: Water quality does not meet acceptance criteria	
Reasons for selecting treatment option	– Studies and analysis performed show that these treatments achieve a stable condition for the proposed closure landform
Responsibility for plan: – Approval – Implementation	– Environment team – Site operations
Proposed actions	– All imported hazardous materials to be stored and used in accordance with relevant standards and removed from site on completion of operations – Mine affected water dams to be decommissioned and areas rehabilitated – Surface water monitoring to be undertaken in accordance with EA conditions – A contaminated land investigation will be undertaken at the completion of operations and remediation works undertaken as appropriate – Rehabilitation of disturbed areas will be undertaken as soon as practical after land becomes available
Resource requirements	– Undertake surface water sampling – Sampling equipment and infrastructure to allow collection of samples
Performance measures and constraints	– Surface water milestone criteria
Reporting and monitoring	– Monitoring when sufficient runoff or surface water flow events occur – Reporting under existing EA requirements
Risk timing and scheduling	– During runoff or surface water flow events suitable for the collection of surface water samples
Risk Event 4: Contaminated land resulting in the presence and potential migration of contaminants in soil, surface water and groundwater	
Reasons for selecting the treatment option	– Studies and analyses performed show that these treatments achieve a stable condition for the proposed closure landform
Responsibility for plan: – Approval – Implementation	– Environment team – Site operations
Proposed actions	– Environmental monitoring and reporting as per the EP Act 1994, EEO and existing EA requirements. – At the completion of operations, all stored hazardous materials and infrastructure within the MIA and CHP, that have the potential to release contaminants to groundwater, will be appropriately recycled or disposed.

Aspect	Risk Treatment
	– Contaminated land investigation to be undertaken at the completion of operations to identify contamination that has the potential to adversely impact PMLUs – Implementation of remediation and/or management plans as required to reduce potential contaminate land risks
Resource requirements	– Suitably Qualified Persons (SQP) to undertake contaminated land investigations and oversee on-going monitoring requirements – Sample collection, laboratory analyses and engineering controls
Performance measures and constraints	– Attainment of surface water milestone criteria and a site suitability statement
Reporting and monitoring	– Contaminated land investigation report and reporting of water quality as per EA
Risk timing and scheduling	– Contaminated land Investigation at closure and water sampling as per PRCP monitoring program
Risk Event 5: Failure of creek diversions to meet closure criteria	
Reasons for selecting treatment option	– The selected treatment focuses on repair, stabilisation, and redesign because diversion performance risks are typically driven by hydraulic capacity exceedance, erosion or construction defects.
Responsibility for plan: – Approval – Implementation	– Environment team – Site operations – Registered Professional Engineer of Queensland (RPEQ)
Proposed actions	– Inspect diversion following rainfall events – Identify areas of erosion, instability or capacity exceedance – Undertake repair works (e.g. rock armour repair, vegetation re-establishment) – Diversion monitoring – Maintenance as identified
Resource requirements	– Earthmoving equipment – Rock armouring materials – Survey and inspection personnel
Performance measures and constraints	– Tracking against milestone criteria – Compliance with design – No uncontrolled erosion or failure
Reporting and monitoring	– Inspection reports following significant rainfall events – Maintenance and repair records – Annual diversion performance assessment
Risk timing and scheduling	– From the construction of the diversion to the final achievement of PMLU

Table 25: Necessary risk treatments identified to achieve a safe and structurally stable NUMA that does not cause environmental harm.

Risk Event 6: NUMA does not achieve safe, structurally stable condition or causes environmental harm	
Reasons for selecting the treatment option	– Studies and analyses performed show that these treatments achieve a safe and structurally stable condition for the NUMA
Responsibility for plan: – Approval – Implementation	– Site operations – Technical Services
Proposed actions	– Geotechnical assessment and final void wall design – Pit floor treatments as required during operations to improve low-wall stability – Geotechnical monitoring during operations – Updated geotechnical assessment to be completed as mining approaches final limits and wall design, and NUMA extent adjusted if required – NUMA extents are designed to include a geotechnical setback limit
Resource requirements	– Geotechnical assessment and design
Performance measures and constraints	– Tracking against milestone criteria
Reporting and monitoring	– Geotechnical monitoring
Risk timing and scheduling	– From detailed closure design of each void to relinquishment

The results of the risk assessment have been used to confirm the suitability of the PMLU rehabilitation milestone criteria and the NUMA improvement milestone criteria. The risk assessment results were also taken into account in the development of the scheduled completion dates for achievement of the milestones.

8 Rehabilitation Trials

As discussed in Section Landform Design 6.1.5, EA Table F2 allows for the establishment of trial slopes on the overburden emplacements in the final landform at slopes greater than 15% and up to angle of repose. Any trial slopes would be specified during the final design of specific overburden emplacement rehabilitation as per Rehabilitation Milestone 3 (Section 10.4).

No rehabilitation trials have been undertaken or reported upon at Callide Mine. No trials are currently planned, though as part of continuous improvement they may be undertaken in the future.

9 Monitoring and Maintenance

This section provides the rehabilitation monitoring and maintenance plans for the relevant milestone criteria. Reporting of rehabilitation monitoring results and the progressive achievement of milestone criteria is also discussed in this section (Section 9.9).

9.1 Rehabilitation Monitoring

Rehabilitation monitoring focuses on the milestone criteria that relate to achieving successful PMLUs of bushland, grazing or watercourse, and will be undertaken by an AQP. A combination of monitoring, reporting and data analysis will be used to demonstrate the achievement of the rehabilitation milestones as detailed in Table 26.

Table 26: Rehabilitation milestones with relevant reporting requirements

Milestone Reference	Rehabilitation Milestone	Reporting Requirements
RM1	Infrastructure decommissioning and removal	• Document visual inspections • Document regulated waste removal • Assessment report for mine water dams
RM2	Identification, remediation and removal of contaminated land	• Contaminated Land Investigation Document, including a site investigation report, and, where required, a Validation Report and/or a draft Site Management Plan
RM3	Landform Development (Reshaping/Reprofiling)	• Survey/LiDAR of landform • Analysis of final landform, cover design, and erosion and sediment control systems against design • Assessment that the landform is geotechnically stable
RM4	Surface Preparation (bushland and grazing)	• Document growth media depth • Growth media assessment and amelioration and physical treatment plan • Document ameliorants and physical treatments applied
RM5	Revegetation (bushland, grazing, watercourse)	• Document the seed mix administered, purity information, planting timing, seed application rates and areas
RM6	Achievement of Surface Requirements (bushland)	• Rehabilitation monitoring as per Section 9.2
RM7	Achievement of Surface Requirements (grazing)	• Rehabilitation monitoring as per Section 9.2
RM8	Achievement of Surface Requirements (watercourse)	• Rehabilitation monitoring as per Section 9.2.7
RM9	Achievement of Bushland PMLU to a Stable Condition	• Rehabilitation monitoring as per Section 9.2 • Hazard assessment

Milestone Reference	Rehabilitation Milestone	Reporting Requirements
RM10	Achievement of Grazing PMLU to a Stable Condition	• Rehabilitation monitoring as per Section 9.2 • Hazard assessment
RM11	Achievement of Watercourse (Engineered Diversion) PMLU to a Stable Condition	• Rehabilitation monitoring as per Section 9.2.7 • Hazard assessment
RM12	Retained infrastructure	• AQP Certification

The rehabilitation monitoring methods are based on those outlined in the RAC Report, with some amendments to align with the milestone criteria.

9.1.1 Remote sensing and technology

The current rehabilitation monitoring program is based on the collection and analysis of field data by an AQP. Future advancements may include the integration of remote sensing, emerging technologies, and digital data capture methods, to be incorporated where practical.

9.1.2 Erosion Monitoring

To support the achievement of surface requirements and the PLMU to a stable condition, erosion monitoring will be conducted in conjunction with vegetation and soil monitoring. Erosion monitoring will be undertaken by an AQP, with the type of erosion and the associated severity recorded based on the erosion classifications in Erosion monitoring will typically be undertaken along a 50 m transect running through the centre of the monitoring site (Figure 26). Erosion will be monitored using the transect tape to measure the length of each erosion gully and a measuring tape to measure depth from the soil surface. Comparative images will be taken from a consistent direction.

Table 27. Where erosion is present, the width and depth will be recorded to enable categorisation into 0.3 – 1.5m, 1.5 – 3.0m, or >3m.

Sheet, rill, or gully erosion classified as severe in accordance with the *Australian Soil and Land Survey Field Handbook* (National Committee on Soil and Terrain, 2009) will be repaired (Erosion monitoring will typically be undertaken along a 50 m transect running through the centre of the monitoring site (Figure 26). Erosion will be monitored using the transect tape to measure the length of each erosion gully and a measuring tape to measure depth from the soil surface. Comparative images will be taken from a consistent direction.

Table 27). Minor or moderate erosion, and other erosion types such as tunnel erosion, will be assessed by an AQP and rectified where intervention is necessary to ensure the PMLU is achieved.

Erosion monitoring will typically be undertaken along a 50 m transect running through the centre of the monitoring site (Figure 26). Erosion will be monitored using the transect tape to measure the length of each erosion gully and a measuring tape to measure depth from the soil surface. Comparative images will be taken from a consistent direction.

Table 27: Erosion classification framework

Erosion classification	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope, etc	Loss of surface horizon; root exposure; moderate substantial soil deposits downslope
Rill erosion	<0.3m deep <15 rills/transect*	<0.3m deep 15-30 rills/transect*	<0.3m deep >30 rills/transect*
Gully erosion	Absent	>0.3m deep Gullies are linear, continuous, and restricted to primary or minor drainage lines	>0.3m deep Gullies are continuous or discontinuous, and either tend to branch away from primary drainage lines and onto foot slopes, or have multiple branches within drainage lines
Tunnel erosion	Absent	Absent	Present
Mass movement	Absent	Absent	Present

Source: NCST (2009) Australian Soil and Land Survey Field Handbook, 3rd edition. The National Committee on Soil and Terrain. CSIRO Publishing, Collingwood, Australia.

**Transect linear 100 m across the contour (Source: Tongway, D. J. and Hindley, N. L. 2005. Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes. CSIRO Publishing, Canberra, Australia)*

9.2 Bushland and Grazing monitoring

9.2.1 Monitoring Schedule

The rehabilitation monitoring schedule follows a phased approach (Table 28), with annual monitoring during the first two years to assess the core parameters of success of the rehabilitation. This allows timely evaluation of post-seeding performance and informs whether rehabilitation is on track to meet surface requirements or requires maintenance.

Vegetation monitoring will commence after the first wet season following the completion of final seeding. Monitoring will occur for the first two years (commencing after the first typical wet season following final seeding), again at the fifth year, and then every five years until the rehabilitation is certified. The frequency of monitoring will be adjusted as necessary, and dependent on the growing conditions during the initial revegetation phase.

Table 28: Rehabilitation Monitoring Schedule

Rehabilitation parameter	**Monitoring Schedule**			
	Year 1	**Year 2**	**Year 5**	**Year 10 + (5-yearly thereafter)**
Both bushland and grazing PMLU				
Landform and erosion	X	X	X	X
Soil and spoil	X	-	X	*
Bushland PMLU				
Species richness	-	X	X	X
Invasive and exotic plants	-	X	X	X
Groundcover	-	X	X	X
Canopy cover	-	-	X	X
Tree species recruitment	-	-	X	X
Tree health and attributes	-	X	X	X
Fauna presence	-	X	X	X
Grazing PMLU				
Invasive plants	-	X	X	X
Groundcover	X	X	X	X
Land Condition	-	-	X	X
Grazing Land Suitability	X	-	-	-
** At the discretion of an AQP*				

9.2.2 Rehabilitation monitoring sites

Representative permanent rehabilitation monitoring sites for each PMLU will be established during the initial monitoring phase (Year 1) and assessed across all subsequent phases of the rehabilitation monitoring program. Permanent field monitoring sites will be selected in accordance with the following criteria:

- Representative of the rehabilitation slope
- Accessible (vehicle access preferred)
- Total area of rehabilitation unit (creating 1 site per 60 ha of contiguous vegetation)

9.2.3 General rehabilitation monitoring parameters

9.2.3.1 Landform and erosion

Landform and erosion will be assessed during all rehabilitation monitoring phases (Table 28). Prior to field monitoring, a desktop assessment using LiDAR and aerial imagery will be completed to compare the rehabilitated slope against the landform design and guide ongoing slope monitoring.

The desktop assessment will identify:

- Areas of potential ponding due to dump settlement
- Areas of deposition where ground levels have increased over time
- Progression of erosion features, including developing gullies

Field-based erosion monitoring will be conducted at permanent monitoring sites and at any additional areas identified through the desktop assessment. Erosion will be assessed based on the classifications in Section 9.1.2.

9.2.3.2 Soil and Spoil

A minimum of five representative surface soil samples (top 5 cm) will be obtained along the 50 m transect, with the samples then combined for analysis. Analysis will include the parameters detailed in Table 29 and will be completed by a National Association of Testing Authorities (NATA) accredited laboratory. Sample points should be a minimum of 5 m from one another and should consider microhabitats.

In addition to surface soil monitoring, a soil core will be obtained within 10 m of the 50 m transect line. The soil core will be taken to a depth of 1 m or to refusal. The soil core will be analysed at 10 cm increments where possible.

Table 29: Soil analysis for rehabilitation monitoring

Category	Analyte	Purpose of analyte
Acidity/Alkalinity	pH	Identify anomalies that may affect plant growth and sustainability
Salinity	EC	Identify any potential of a leaching profile. High salinity can lead to poor vegetation germination and establishment, reduced plant growth and vigour.
Exchangeable cations	Cation Exchange Capacity (CEC)	A major factor in soil fertility. Controls soil stability, nutrient availability and buffers the soil's chemical properties.
	Exchangeable Sodium Percentage (ESP)	ESP is a measure of the dominance of sodium ions on the soil's cation exchange complex. Sodicity in soils can lead to slaking and dispersion, which impacts soil structure and stability.
Organic Matter	Organic Carbons	An indicator of soil nutrient stores and a contributor to improvements in soil structure. Increases in organic carbon are a key indicator of rehabilitation success.
Major Elements	Total Nitrogen	An indicator of soil nutrient stores, and is also a major plant nutrient.
	Total and extractable Phosphorus, Copper, Manganese and Zinc	An indicator of phosphorus, copper, manganese and zinc readily available to plants
Physical Properties	Particle size analysis	Texture determines the water and thermal properties, erosion susceptibility, gas exchange possibilities, and microbiological activity of soils
	Chloride content	Essential for plant growth – assists with the uptake of other soil nutrients and regulates the water flow through a plant
	Emerson Class	A description of the extent of dispersion of a soil aggregate in water. High dispersion scores represent a low structural stability.

9.2.3.3 Groundcover

Groundcover will be assessed at permanent rehabilitation monitoring sites during all scheduled monitoring events.

Groundcover type will be recorded as one of the following categories:

- Live vegetation cover

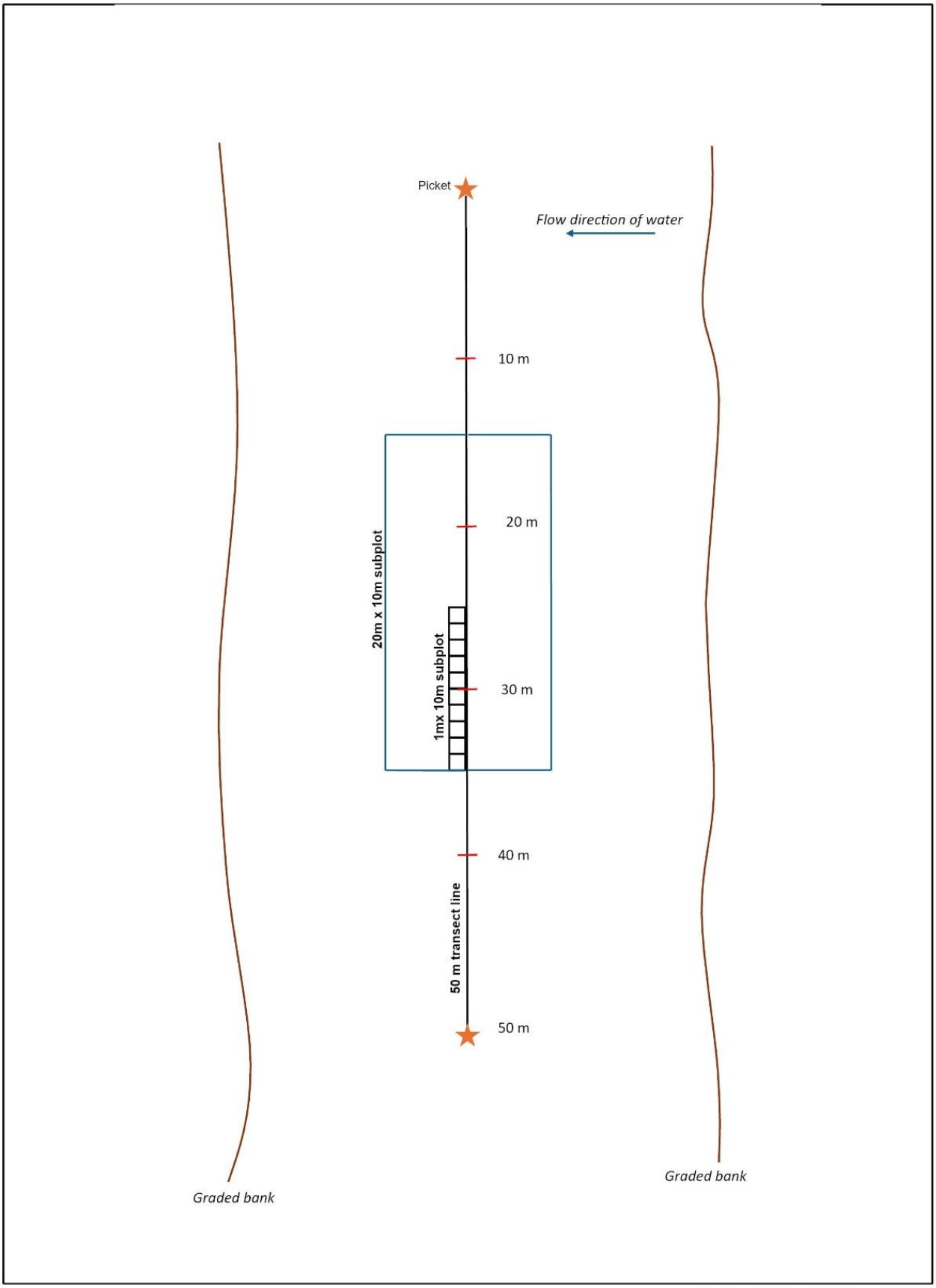
- Live vegetation cover will be categorised by species, with notation as to whether the species are native, exotic, a pastoral species, or an invasive weed.

- Standing dry vegetation cover
- Organic litter (including fine and coarse organic material such as fallen leaves, twigs, branches and hay)
- Rock
- Bare ground
- Coarse woody debris

9.2.3.4 Revegetation Monitoring

Vegetation monitoring will be undertaken at an appropriate density for the area being monitored to ensure representative coverage. Rehabilitation monitoring sites will typically comprise a plot covering an area of 20 m x 10 m, as shown on Figure 26. The start and end points of each monitoring site on the transect line will be marked using a picket, and the GPS location recorded.

A general description of the vegetation type (e.g., mixed eucalypt woodland with grass understory) within each monitoring site will be recorded. The plot will then be divided into subplots. The subplots will typically be used as depicted in Figure 26, with the vegetation monitoring parameters collected as described in Table 30.



CALLIDE MINE PRCP

Typical Vegetation Monitoring Plot Design

FIGURE 26

BATCHFIRE CALLIDE

Figure 26: Typical Vegetation Monitoring Plot Design

Table 30: Typical Vegetation Monitoring Parameters

Typical Sub-Plot	Parameters
1m x 10m sub-plot	Assesses groundcover within 10 replicates of 1 m x 1 m quadrats • Record the percentage cover of live plants (by species), dead plants, litter, logs, rocks, and bare ground. • When recording all species percentage cover within each quadrat, categorise species as native, invasive, exotic, or a pasture species.
20m x 10m sub-plot	• Note the tree density by species as stems/ha. Only count those >1.6m in height. • Species richness – total number of different species in each life form layer (trees, shrubs, grasses, forbs/other). • Count the number of canopy and sub-canopy species recruits (i.e. individuals with a DBH of <5cm). • Subjectively describe tree health (by species, if relevant), noting signs of drought, stress, nutrient deficiencies, disease and severe insect attack. • Record the percentage of healthy trees within the subplot. • Record invasive species present and the extent of infestation as a percentage of the sub-plot area.
50 m transect	• Erosion monitoring along the transect (keeping details on presence such as type, depth, width, active/inactive). • Record a general description of the vegetation type. • Photograph from each end of the plot, facing in towards the centreline. • Collect soil and spoil samples from across the area. • Record canopy cover and height over the 50m centreline using transect tape. Measure canopy, sub-canopy, and shrub layers where present.
1ha plot meander	• Note evidence of fauna presence (native and invasive). • Note habitat features. • Record additional flora species not encountered within the 20 x 10 m plot.

9.2.4 Bushland-specific rehabilitation monitoring

The rehabilitation monitoring methodology for bushland PMLUs is a hybridised system of historical monitoring and BioCondition practices. Batchfire methodology adopts the BioCondition definitions and general approach, but on a condensed spatial and parameter scale. This methodology maintains comparability to previous monitoring results, while allowing the monitoring data to be understood, processed, and implemented by various AQPs and assessors.

9.2.4.1 Species richness

Species richness will be assessed at permanent rehabilitation monitoring sites during all monitoring phases. This assessment will comprise a full floristic survey, including the identification and enumeration of trees, shrubs, grasses (native and exotic), forbs, and other groundcover species at each site.

9.2.4.2 Canopy cover

Tree canopy cover will be assessed at permanent rehabilitation monitoring sites from Year 5 onwards using the line intercept method. The crown width of each tree (defined as a single-stemmed woody plant greater than 2 m in height) and each shrub (defined as a woody plant that is multi-stemmed from the base or within 200 mm of ground level, or, if single-stemmed, less than 2 m in height) will be measured in accordance with Eyre et al. (2015). Intercept lengths will be recorded and summed to determine total canopy and shrub intercept distances, which will be converted to percentage cover for each monitoring site.

9.2.4.3 Tree species recruitment

Recruitment will be assessed at permanent rehabilitation monitoring sites from Year 5 onwards. Recruits (defined as individuals with a diameter at breast height of less than 5 cm) will be recorded as a count per species. Recruitment of canopy species will be evaluated by determining the proportion of dominant canopy species exhibiting regeneration at each monitoring site.

9.2.4.4 Invasive and exotic plants

Invasive and exotic species will be assessed at permanent rehabilitation monitoring sites and reference sites during all monitoring phases. The presence and percentage cover of invasive plants, expressed as a proportion of total vegetation cover, will be recorded at each site.

9.2.4.5 Fauna monitoring

As with the BioCondition methodology, the Batchfire vegetation monitoring methodology alone will not provide an accurate picture of habitat suitability and use (Eyre et al., 2015). To supplement, all opportunistic observations of fauna will be recorded during vegetation and soil monitoring, and notes of habitat features will be made in the meander. Beyond the direct observation of fauna utilisation of the rehabilitation site, habitat evidence and features to be considered for notation include dead trees and hollows, bird nests, termite mounds, scats, and rock formations.

9.2.5 Grazing Specific revegetation monitoring

9.2.5.1 Invasive plants

Invasive plants are a biosecurity matter under the Queensland *Biosecurity Act 2014* (Biosecurity Act), being species that have, or are likely to have, an adverse impact on a biosecurity consideration due to their introduction, spread or increase in population within an area. Biosecurity matter is categorised as either prohibited matter or restricted matter under the Biosecurity Act. Prohibited matter includes species that are not known to be established in Queensland and are subject to exclusion or eradication objectives under the biosecurity framework. Restricted matter includes invasive plant species that are present within Queensland and are regulated to manage their biosecurity impacts. A list of restricted invasive plant species is provided in Schedule 2, Part 2 (Restricted matter – invasive biosecurity matter) of the Biosecurity Act.

Restricted invasive plants will be assessed at permanent rehabilitation monitoring sites and reference sites during all monitoring phases. Assessment will include recording the presence and percentage cover of invasive plant species, expressed as a proportion of total vegetation cover at each site.

9.2.5.2 Land Condition

Land condition is classified into four broad categories under the Grazing Land Management ABCD land condition framework based on indicators associated with pasture and soil condition, as detailed in DES (2022a) (Table 31). For cattle grazing rehabilitation to achieve the PMLU to a stable condition, land condition must be assessed as Good (A) condition for non-grazed areas, or Good (A) or Fair (B) condition for grazed areas. When land is in a Poor (C) or Degraded (D) condition, maintenance

measures are required to improve the land condition. Land condition will be assessed at permanent grazing rehabilitation monitoring sites from Year 3 onwards, allowing at least two growing seasons post-seeding for pasture establishment.

Table 31: Grazing Land Management ABCD Land Condition Framework (DES 2022a)

Category	Attribute
A-condition – good condition	A condition land has all of the following features: • Dominance of 3P (palatable, perennial and productive) pasture species with little bare ground (<30 %) • Few weeds and no significant infestations • No erosion and good soil surface condition
B-condition – fair condition	B condition land has at least one or more of the following features, but otherwise is similar to A condition land: • Some decline of grasses that are 3P grasses, increase in other species (less favoured grasses, weeds) and/or bare ground (more than 30% but less than 50% in most years) • land types will typically have at least 50% ground cover and less than 70% in most years at the end of the dry season • some decline in soil condition, Signs of previous erosion or potential erosion risk
C-condition – poor condition	C condition land has one or more of the following features, but otherwise is similar to B condition land: • Land with poor or degraded condition will typically have less than 50% ground cover at the end of the dry season • General decline of grasses that are 3P grasses, large amounts of less favoured species and/or bare ground (greater than 50% in most years • Obvious signs of previous erosion or current susceptibility to erosion is high
D-condition – very poor condition	D condition land has one or more of the following features: • Generally less than 20% ground cover • Lack of perennial grasses or forbs • Severe erosion and scalding, resulting in a hostile environment for plant growth

9.2.5.3 Grazing Land suitability assessment

No additional sampling is required to assess the land suitability of rehabilitated areas at Callide Mine. Land suitability will be determined based on the assessment of relevant physical and chemical properties of topsoil and spoil, as described in Section 9.2.3.2.

PRCP milestone criteria for achieving PMLU to a stable condition for grazing (RM10) will be assessed against the land suitability framework set out in *Rehabilitated mined land suitability for beef cattle grazing in the Bowen Basin: Technical Paper 1* (Short, 2023), Office of the Queensland Mine Rehabilitation Commissioner (OQMRC)

Table 32: Regional land suitability framework in the Bowen Basin (Short, 2023)

Limitation	Indicator	Suitable			Unsuitable	
		Class 1	Class 2	Class 3	Class 4	Class 5
Water availability	Soil water storage (mm)	>75	75–60	<60–40	<40–30	<30
Nutrient deficiency	Available-P (mg/kg) (0–0.1 m)	>20	20–14	<14–8	<8–4	<4
Nutrient availability and toxicity	pH (0–0.1 m)	7.3–6.6	<6.6–6.0 >7.3–7.9	<6.0–5.6 >7.9–8.4	<5.6–5.0 >8.4–9.0	<5.0 >9.0
Surface condition	Surface condition	Fine (peds <10 mm)	Coarse (peds >10 mm)	Surface crust	Very hard setting	Massive
Salinity	ECe (dS/m) (0–0.6 m ERD)	<2	2–4	>4–10	>10–16	>16
Rockiness	Gravel 20–60 mm (%)	<20	20–50	>50–70	>70–85	>85
	Cobble 60–200 mm (%)	<10	10–20	>20–50	>50–75	>75
	Stone 200–600 mm (%)	<2	2–10	>10–20	>20–50	>50
	Boulders >600 mm (%)	0	<2	2–10	>10–20	>20
Slope gradient	Slope (%)	<5	5–10	<10–15	>15–20	>20
Microrelief	Vertical (m)	0	<0.2	0.2–0.4	>0.4–0.6	>0.6
Water erosion	Slope <6% (ESP %)	<5	5–8	>8–12	>12–18	>18
	Slope 6–14% (ESP %)	<3	3–6	>6–10	>10–12	>12
	Slope >14% (ESP %)	<1	1–2	>2–4	>4–6	>6
Subsoil erosion	ESP (%) at 0.5 m	<6	6–14	>14–23	>23–34	>34
Potentially acid forming materials	Depth to strongly acid (pH <4.5) (m)	>3	3–2	<2–0.9	<0.9–0.6	<0.6

9.3 Watercourse (Engineered Diversion) Monitoring

Watercourse monitoring will be conducted at Callide Mine to assess the performance of creek diversions that were required for the progression of mining. The monitoring program will evaluate whether rehabilitated watercourses (diversions) meet the watercourse surface requirements (RM8) and final PMLU milestone criteria (RM11).

Callide Mine is required to manage the Oaky Creek diversion in accordance with the conditions of Water Licence 105184 issued by the Department of Natural Resources and Mines. The licence conditions require the development and implementation of a monitoring and evaluation program consistent with the ACARP guidelines (ID&A, 2001). Monitoring has historically been conducted and will continue to be conducted in accordance with the Index of Diversion Condition (IDC) methodology outlined in the *Monitoring and Evaluation Program for Bowen Basin River Diversions* (ID&A, 2001). The IDC provides a quantitative assessment of geomorphic condition and riparian vegetation and is applicable to both diverted and rehabilitated watercourse reaches.

The Trap Gully Diversion will require a remediation plan designed with consideration of the reduced upstream catchment area associated with the final landform configuration. Monitoring will be required to confirm if the remediated diversion is stable

9.4 Reference Sites

9.4.1 Bushland habitat reference sites

Bushland habitat reference sites have been established in areas of remnant vegetation undisturbed by mining, as shown in Figure 16 and Table 33. The reference sites have been periodically monitored and will continue to be monitored on a 5-year frequency both during the operational and post-operational phases of the mine.

Table 33: Callide Mine bushland reference sites

Site ID	**Site 42A**	**Site 27**	**Site 17**
General Location	Trap Gully	Dunn Creek	Dunn Creek
Image			
Coordinates (AGD84 Zone 56)	24.2781613° S, 150.5818163° E	24.2987582° S, 150.6103728° E	24.2928288° S, 150.6250684° E
Regional Ecosystem	11.10.13 / 11.10.4	11.10.13 / 11.10.1	11.10.13 / 11.10.1
Live plant cover %	20.2 %	41.3 %	5.5 %
Canopy Cover %	25.0 %	46.8 %	42.1 %
Tree species	*Eucalyptus crebra* *Corymbia citriodora* *Eucalyptus moluccana* *Alphitonia excelsa* *Acacia polifolia*	*Eucalyptus crebra* *Corymbia citriodora* *Diospyros humilis* *Alphitonia excelsa* *Acacia crassa*	*Eucalyptus cloeziana* *Eucalyptus suffulgens* *Eucalyptus trachyphloia* *Acacia blakei* *Acacia pubicosta* *Alphitonia* sp.
Shrubs (S), grasses (G), and forbs (F) * *= Non-native*	*Dodonaea triangularis* (S)	*Carissa ovata* (S) *Alyxia ruscifolia* (S) *Alternanthera nodiflora* (F) *Pandorea pandorana* (S) *Seringia corollate* (F) *Cyperus dietrichiae* (F) *Erythroxylum australe* (S) *Hibiscus heterophyllus* (S) *Megathyrsus maximus* (G) * *Oplismenus aemulus* (G)	*Grevillea hockingsii* (S) *Cleistochloa subjuncea,* (G*)* *Cleistochloa rigida* (G) *Dodonaea triquetra* (S) *Trymalium minutiflorum* (S) *Solanum* sp. (F) *Aristida* sp. (G) *Lomandra* sp. (F)
Invasive Plants * *= Non-native*	*Opuntia tomentosa* (S) *	*Lantana camara* (S) * *Opuntia tomentosa* (S) *	

9.4.2 Grazing reference sites

Grazing reference sites will be established, and thereafter monitored on a 5-yearly basis in accordance with the cattle grazing monitoring requirements specified in Section 9.2. Land suitability classes for grazing reference sites will be assessed against the land suitability framework (Short, 2025). Additional or alternative grazing reference sites may be established where necessary to ensure the achievement and verification of the relevant rehabilitation objectives and completion criteria.

9.5 Surface Water Monitoring

To demonstrate achievement of the PMLUs to a stable condition (RM9 and RM10), surface water within both bushland and grazing land uses will be monitored at the locations (Figure 27 and Table 34) and parameters specified in Table 7 of the Schedule. Samples will be analysed for additional contaminants as part of contaminated land investigations, with the need to include these pollutants in the rehabilitation monitoring analytical suite reviewed as required.

All hand-held electronic multi-parameter water quality meter measurements will be taken in accordance with standard practice DES Monitoring and Sampling Manual - Environmental Protection (Water) Policy 2009 (DES, 2018).

Table 34: Surface water monitoring locations

Monitoring Locations	Receiving waters location description	Latitude (GDA2020)	Longitude (GDA2020)
Upstream monitoring locations			
CC-US	Callide Dam Headwaters, Callide Creek, 2km upstream of Dunn Creek mining area	-24.32238719	150.6699466
DC-US	Dunn Creek, immediately upstream of Dunn Creek mining area	-24.29864182	150.6223858
TH-US	Oaky Creek, 900 metres upstream of The Hut mining area	-24.27718719	150.6447067
TG-US	Timber Reserve Background, upstream of Trap Gully and The Hut mining areas and 2.5km upstream of confluence with Oaky Creek	-24.24868718	150.5666067
BH-US	Campbell's Creek, immediately upstream of Boundary Hill mining area and 6km upstream of confluence with Gate Creek	-24.21635162	150.5234956
BELL-US	Bell Creek, upstream of Boundary Hill mining area	-24.15395788	150.5207176
Downstream monitoring locations			
CC-DS	Callide Creek old Channel, 150m downstream of Gate Creek	-24.25808717	150.4263067
DC-DS1	Dunn Creek, immediately downstream of Dunn Creek Dam	-24.33090669	150.6270436

Monitoring Locations	Receiving waters location description	Latitude (GDA2020)	Longitude (GDA2020)
DC-DS2	Unnamed tributary of Callide Creek, 1.5km downstream of Dunn Creek mining area	-24.33120539	150.6656877
DC-DS3	Unnamed tributary of Callide Creek, 300m downstream of Dunn Creek mining area	-24.32531136	150.5963145
DC-DS4	Unnamed tributary of Callide Creek, immediately downstream of Dunn Creek mining area	-24.32887752	150.6129214
TH-DS	Oaky Creek, immediately downstream of The Hut mining area and 1.2km downstream of the Oaky Creek Diversion	-24.26238765	150.5947489
TG-DS1	Trap Gully Creek, immediately downstream of Trap Gully Creek Diversion	-24.28177801	150.550822
TG-DS2	Unnamed tributary of Oaky Creek, 1km downstream of Trap Gully mining area	-24.29218767	150.5452009
TG-DS3	Oaky Creek, 3.6km downstream of Trap Gully mining area	-24.30822301	150.5092564
BH-DS	Gate Creek, 3km downstream of the confluence with Campbell's Creek	-24.23899273	150.4604612
BHS-DS	Campbell's Creek, 600m downstream of Boundary Hill South mining area	-24.22868718	150.4867067
BHN-DS	Unnamed tributary of Bell Creek, 1.6km downstream of Boundary Hill mining area	-24.18041956	150.4840549
BELL-DS	Bell Creek, downstream of Boundary Hill mining area	-24.15207317	150.4071637

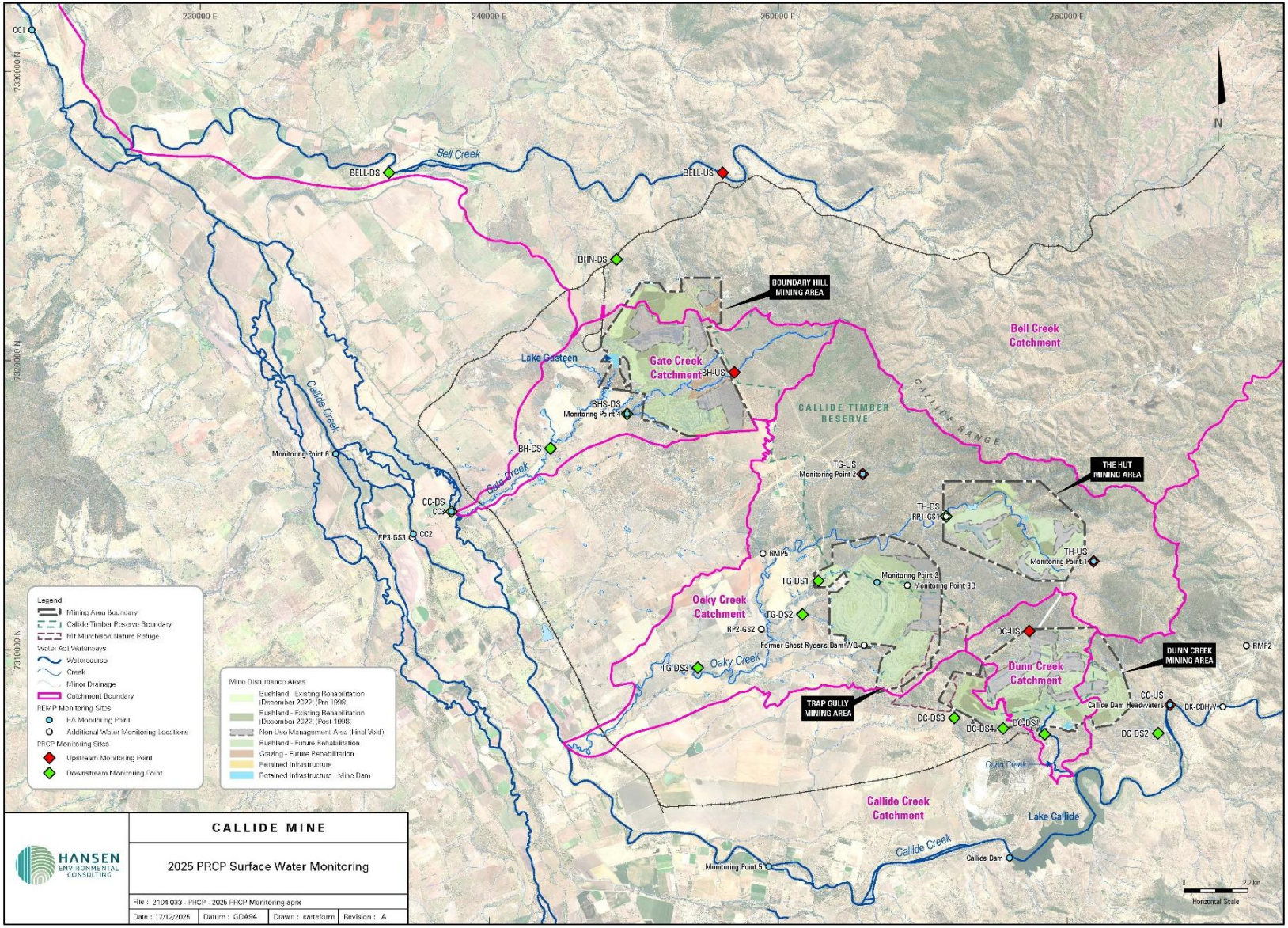


Figure 27: Callide Mine rehabilitation surface water monitoring locations

9.6 Groundwater Monitoring

9.6.1 Groundwater Quality and Levels

Groundwater quality parameters, trigger values and groundwater level criteria will be established based on the results of investigations undertaken in accordance with Schedule Condition PRCP13. Outcomes of these investigations will inform the development and refinement of groundwater monitoring requirements and closure criteria within the PRCP.

9.6.2 Groundwater Monitoring Schedule

During operations, monitoring will continue in terms of the current EA conditions. Post-closure, monitoring will be undertaken quarterly for a minimum of 5 years, with the long-term frequency determined depending on chemistry trends and groundwater level trends. Post-closure monitoring will continue until the surrender or cancellation of any water licences under the Water Act 2000.

9.6.3 Groundwater Monitoring Locations

Groundwater monitoring to support the assessment of closure conditions will be undertaken in accordance with PRCP Schedule Condition 13. The final groundwater monitoring bore network will be determined following the investigations required under that condition and will provide appropriate spatial distribution across the four mining areas of Callide Mine and coverage of key hydrogeological units.

9.7 NUMA Milestone monitoring

Management Milestone monitoring will be undertaken by an AQP to demonstrate achievement of the management milestones, as they relate to achieving sufficient improvement of the NUMA extents.

A combination of monitoring, reporting and data analysis will be undertaken to demonstrate achievement of the management measures (MMs) prior to site relinquishment, as detailed in Table 35.

Table 35: Management Milestones with relevant reporting requirements

Milestone reference	Management Milestone	Reporting Requirements
MM1	Achievement of final landform design	• Final groundwater model and assessment • Final flood model and assessment • Final geotechnical assessment • Final void design • Survey/LiDAR of landform • Analysis of final landform against design
MM2	Achievement of safety requirements	• Document visual inspections of safety bund, fencing and signage

MM3	Achievement of sufficient improvement	• Groundwater monitoring (Section 9.6)
		• Residual voids water quality and level (Section 6.3.2)
		• AQP certification that residual voids:
		  ○ Are safe to humans and livestock
		  ○ Are immune from flooding
		  ○ Highwall landforms are constructed to final design
		  ○ Safety infrastructure installed as per design
		  ○ Will not present an unacceptable risk of environmental harm outside of the tenure

Milestone reference	Management Milestone	Reporting Requirements
		○ Will not impact on the stability of any adjacent rehabilitation areas, or their ability to sustain their PMLU • Document visual inspections of safety bund, fencing and signage

9.8 Rehabilitation Maintenance

Maintenance requirements for rehabilitated areas (both establishing and completed) will be identified during ongoing rehabilitation monitoring (Section 9.1), as well as during ad-hoc inspections of rehabilitated areas. Where rehabilitation maintenance issues are identified, they will be assessed on a case-by-case basis to determine appropriate maintenance and/or remedial actions. Where necessary, suitably qualified specialists would be involved in the identification of appropriate maintenance/remedial measures, e.g., soils specialist, drainage engineer, botanist.

Table 36 provides examples of typical rehabilitation maintenance issues that may arise and possible maintenance/remedial actions that would be considered by Batchfire should these occur.

Table 36: Potential Rehabilitation Maintenance

Issue	Potential Remedial Action
Rehabilitated area fails to germinate or die-off following early establishment	Investigate topsoil quality and potential ameliorants required. Ameliorate and/or reseed affected areas, as required. If necessary, consider different revegetation species for future rehabilitation using this topsoil.
Species mix is not being achieved in revegetation	Investigate topsoil quality and potential ameliorants required. Ameliorate and/or reseed affected areas, as required. Consider alternative revegetation species.
Weed infestation	Assess and apply viable weed control measures for the specific weed species.
Erosion in rehabilitated areas	Investigate the cause of erosion and develop appropriate remediation measures e.g. repair/realign contour drains, additional cross ripping, reseeding bare areas. Repair unstable eroded areas including re-topsoiling and reseeding, where necessary.
Poor runoff water quality	Investigate the source of the poor water quality e.g. erosion causing high suspended sediment or poor soil quality affecting runoff quality. Apply appropriate remedial measures, including those listed above. Desilt sediment control structures and/or install additional sediment controls.

9.9 Reporting

Batchfire will prepare annual PRCP monitoring reports documenting all rehabilitation monitoring results (Section 9.1) and the progressive achievement of the relevant milestone criteria for all active RAs and IAs (Table 37). The reports will include the following:

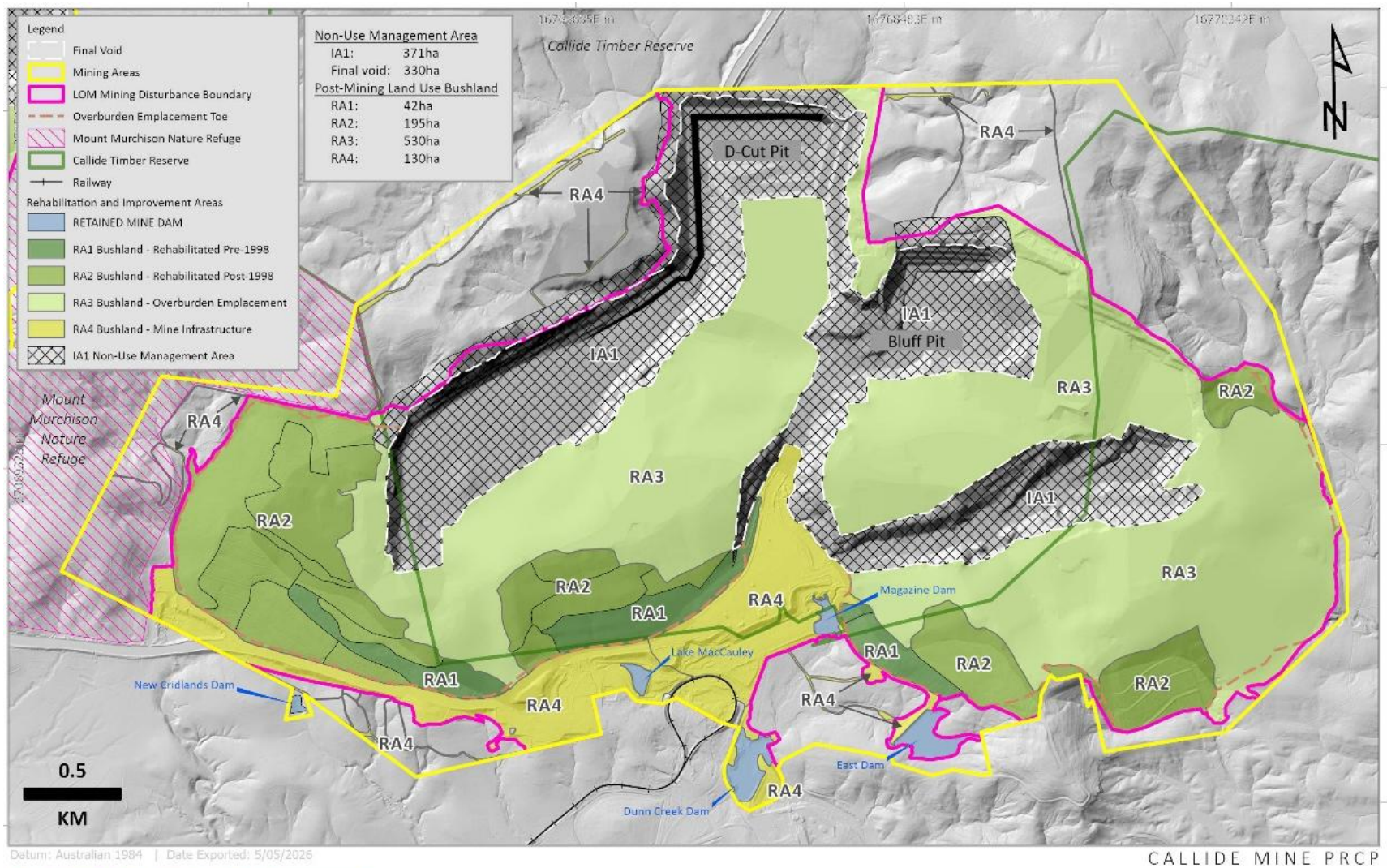
- A register, and corresponding location plan, providing a unique identifier and the location, age, design details and status (against progressive milestone criteria) of all active RAs and IAs.
- Rehabilitation monitoring results for all active RAs, including revegetation, erosion, soils and runoff water quality. These will be presented in graphs and/or tables that will include all prior year monitoring results and comparison with the corresponding milestone criteria. Analysis of the monitoring dataset trends will be provided, including an assessment of the likelihood that the milestone criteria and schedule dates will be achieved. In any instances where the monitoring dataset trends indicate achievement of milestone criteria is not likely, rectification strategies will be identified.
- Details of any rehabilitation maintenance actions identified in rehabilitation monitoring, including the responsible role and proposed timing of implementation.
- Copies of all certifications, post-completion surveys and other assessments completed in accordance with the milestone criteria, supporting the status of rehabilitation and management milestones in the register.
- A full assessment of compliance with the approved PRCP schedule for the reporting year and identification of rectification actions for any non-compliances.

10 PRCP Schedule

This section includes the key PRCP planning information that informed the development of the PRCP Schedule (Appendix A) including:

- Rehabilitation and improvement areas (Figures 28 to 31);
- Land availability for progressive rehabilitation (Figures 32 to 35);
- Rehabilitation milestone timeframes.

The PRCP Schedule (Appendix A) is also provided in Excel format in accordance with the PRCP schedule template (DES, 2019).



BATCHFIRE CALLIDE

Dunn Creek - Rehabilitation Areas (RAs) and Improvement Areas (IAs)

FIGURE 28

Figure 28: Dunn Creek Mining Area Rehabilitation Areas (RAs) and Improvement Areas (IAs)

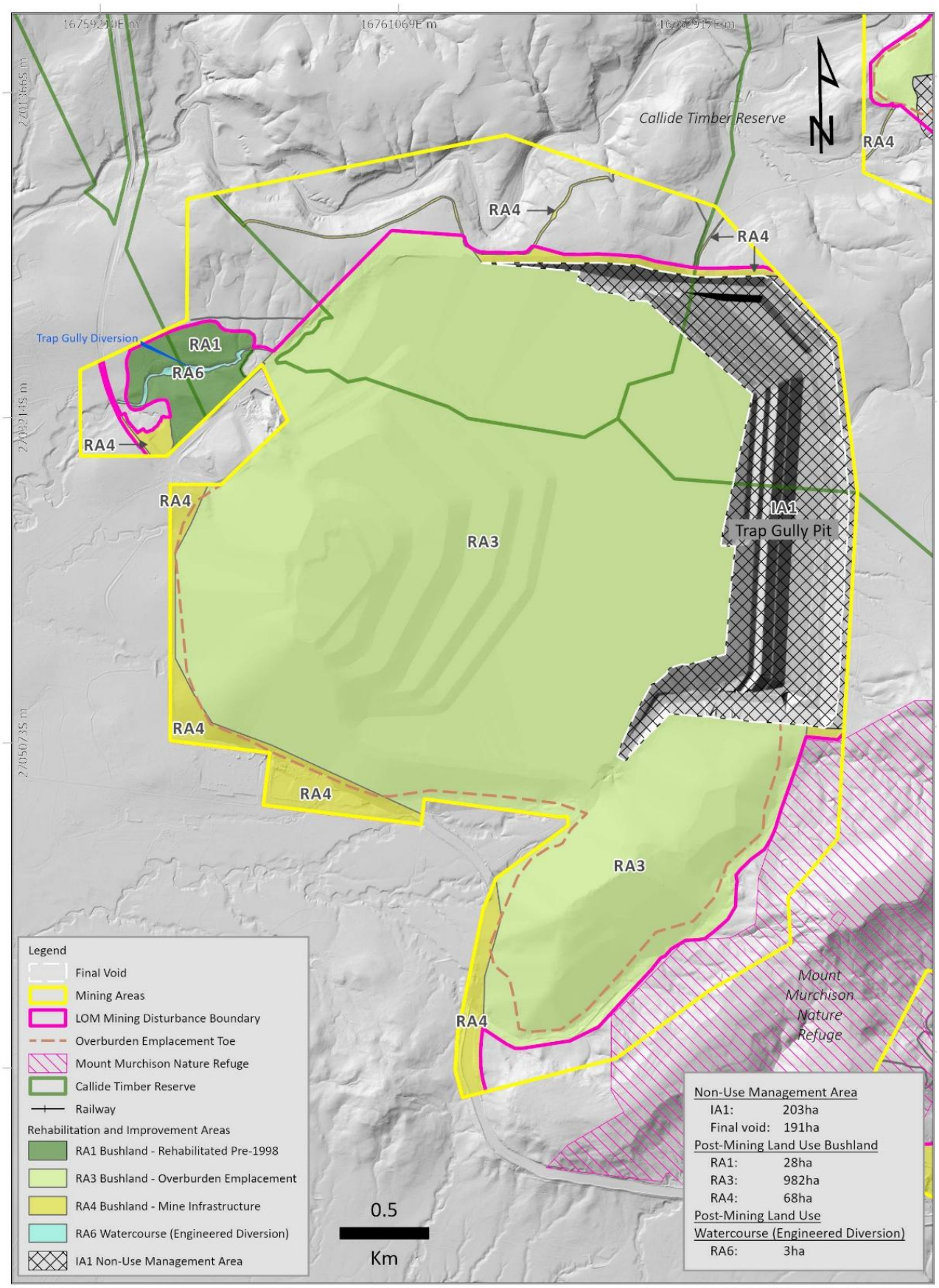


Figure 29: Trap Gully Mining Area Rehabilitation Areas (RAs) and Improvement Areas (IAs)

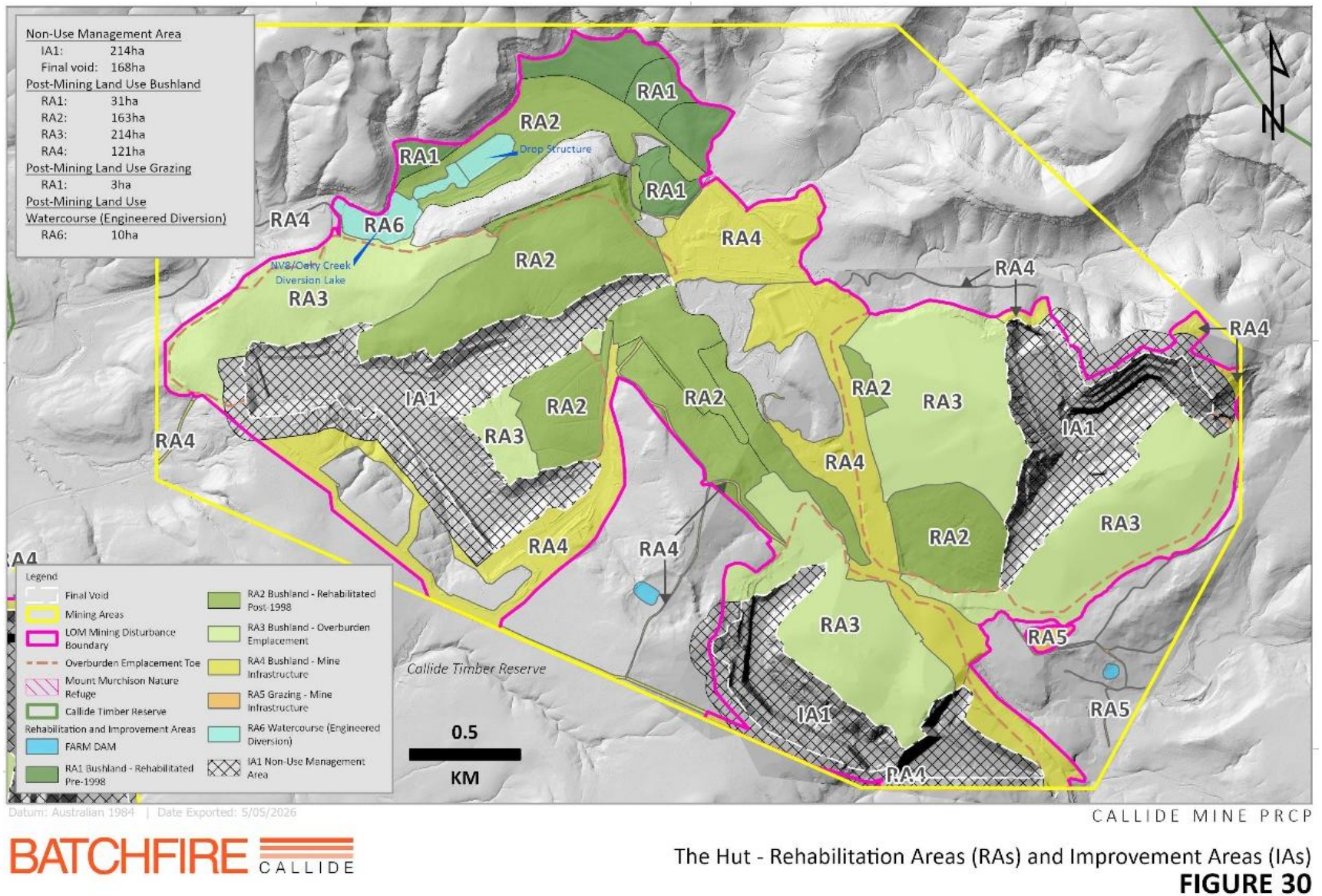


Figure 30: The Hut Mining Area Rehabilitation Areas (RAs) and Improvement Areas (IAs)

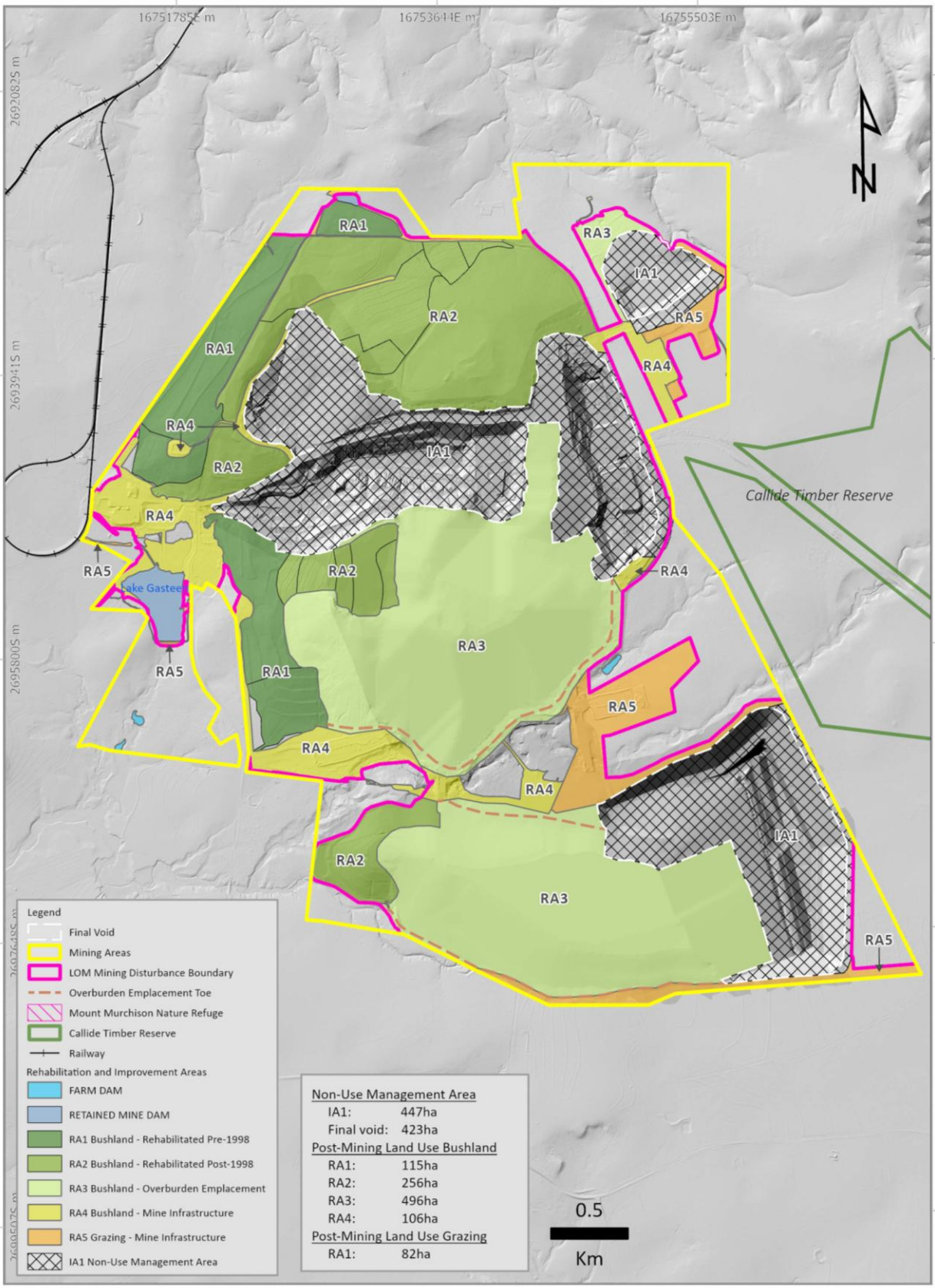


Figure 31: Boundary Hil Mining Area Rehabilitation Areas (RAs) and Improvement Areas (IAs)

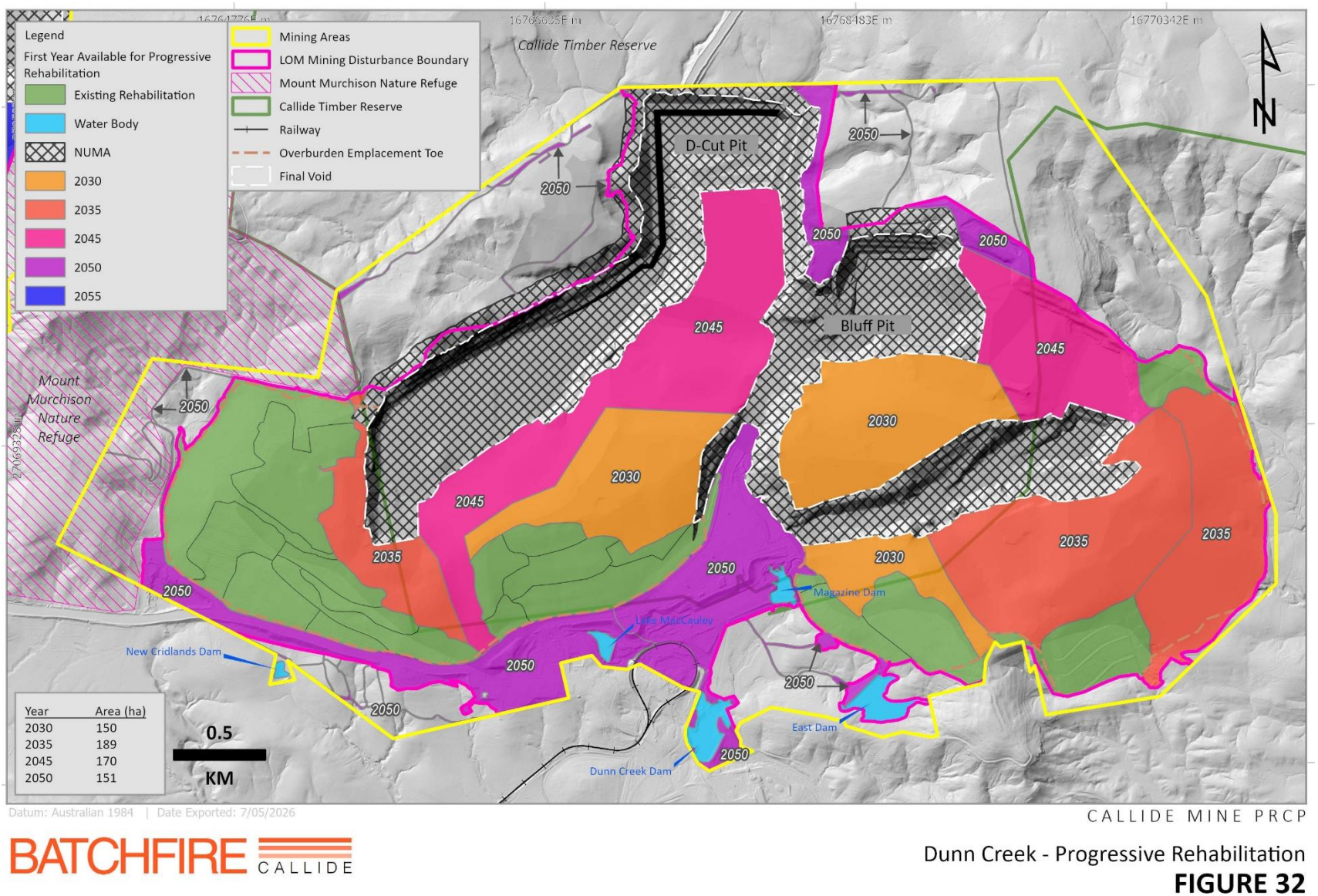
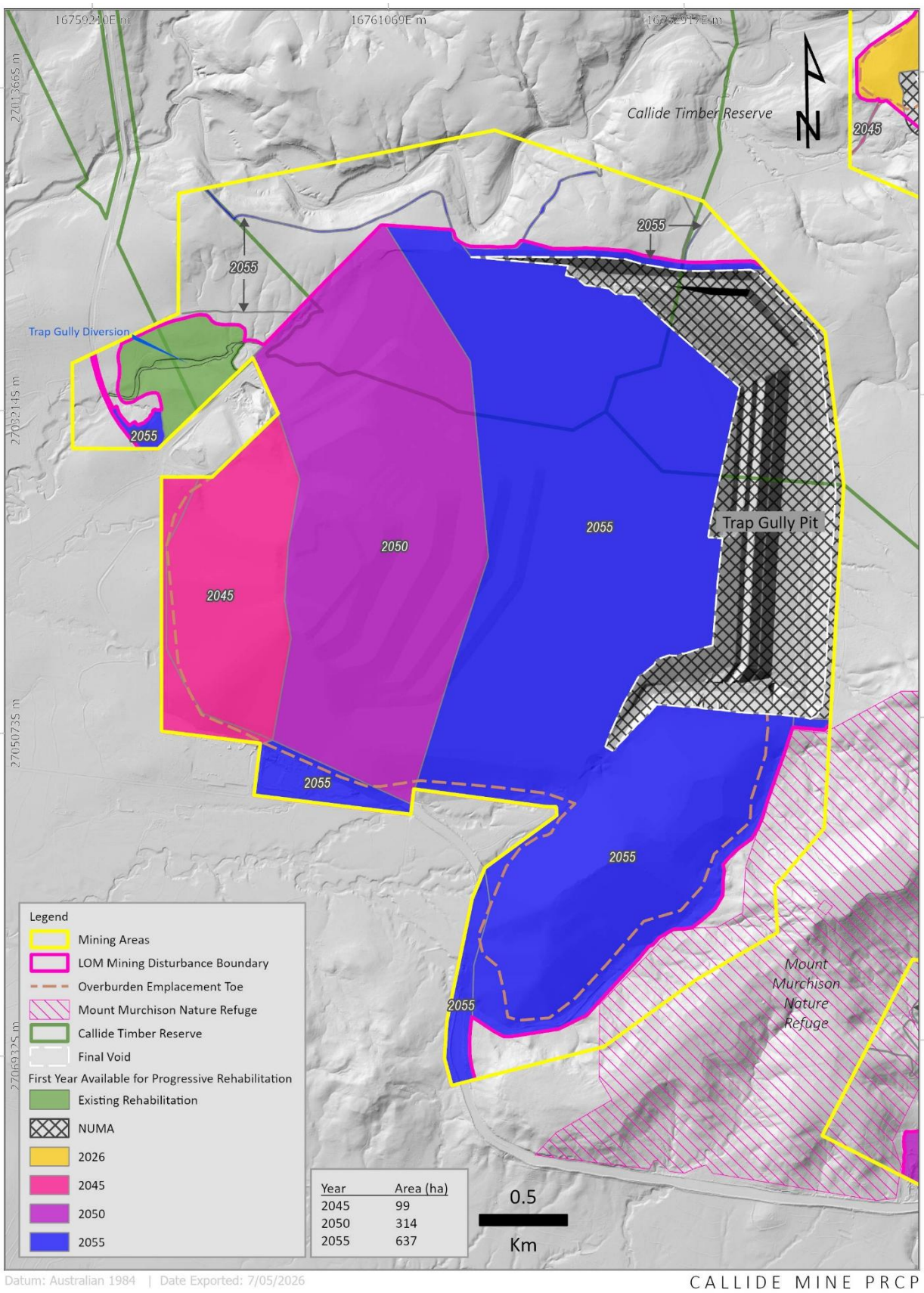


Figure 32: Dunn Creek Mining Area Progressive Rehabilitation



BATCHFIRE CALLIDE

Trap Gully - Progressive Rehabilitation
FIGURE 33

Figure 33: Trap Gully Mining Area Progressive Rehabilitation

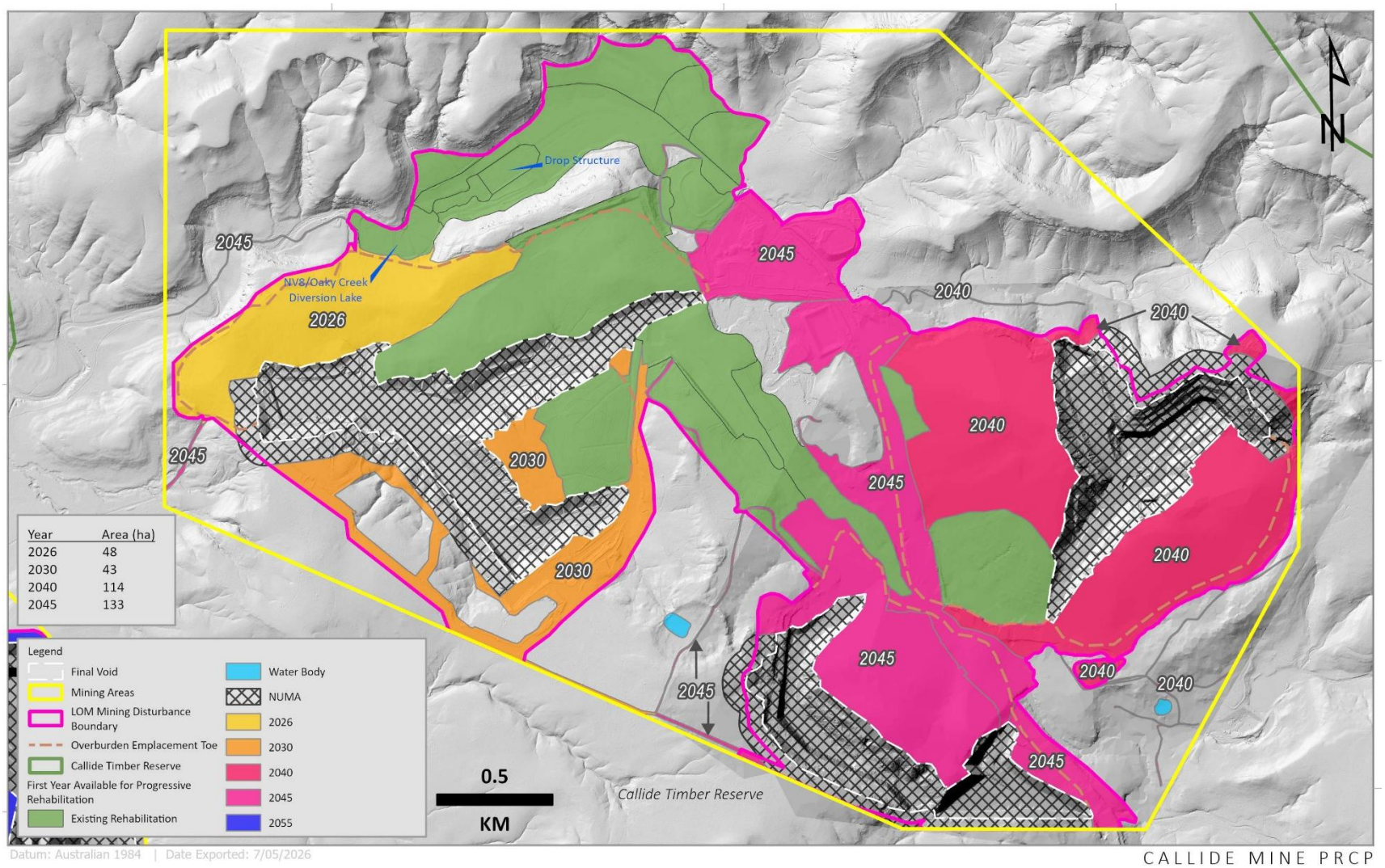


Figure 34: The Hut Mining Area Progressive Rehabilitation

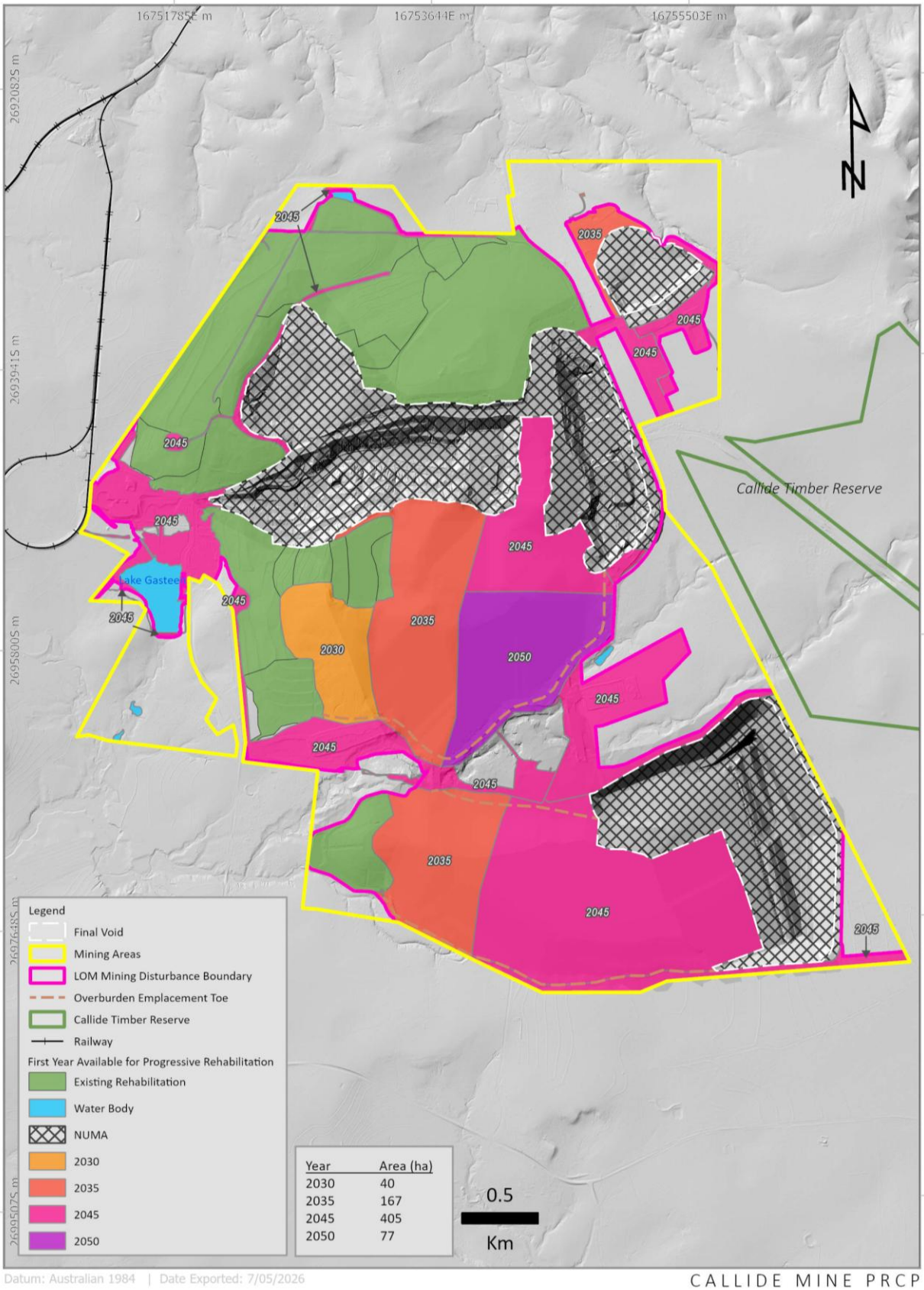


Figure 35: Boundary Hill Mining Area Progressive Rehabilitation

10.1 Rehabilitation and Improvement Areas

A rehabilitation area (RA) is an area of land in the PMLU to which a rehabilitation milestone for the post-mining use relates. As discussed in Section 4, Callide Mine has three PMLUs:

- Bushland;
- Cattle grazing; and
- Watercourse (Engineered diversion)

An improvement area (IA) is, for a NUMA, an area of land in the NUMA to which a management milestone for the NUMA relates. As discussed in Section 5, Callide Mine has one IA which is final voids and ramps.

The RAs and IAs adopted for the PMLUs and NUMA are described in Table 37 and shown in Figures 28 to 31. Only areas of disturbance have been included in the RAs and IAs.

Table 37: Rehabilitation Areas and Improvement Areas

Rehabilitation Area	Post Mining Land Use	Relevant Activity	Total (ha)
RA1	Bushland	Overburden Emplacement Area - Existing Rehabilitation - Pre 1998	216
RA2	Bushland	Overburden Emplacement Area - Existing Rehabilitation - Post 1998	608
RA3	Bushland	Overburden Emplacement Area	2223
RA4	Bushland	Mine Infrastructure Area Roads Laydown areas General infrastructure and disturbance	425
RA5	Grazing	Mine Infrastructure Area Roads Laydown areas General infrastructure and disturbance	85
RA6	Watercourse	Creek Diversions Watercourse crossings	13
IA1	Final Voids and Ramps	NUMA	1235
Retained Water Body		Farm Dams Retained Mine Dam	30
TOTAL AREA (Ha)			**4835**

10.2 Land Availability for Progressive Rehabilitation

Areas will become available for rehabilitation progressively over the life of the mine. Batchfire has developed a LOM rehabilitation schedule for the overburden emplacement areas, mine infrastructure areas and open cut pit final voids in accordance with the current LOM mining schedule, taking into consideration the availability of resources. Figures 32 to 35 show the year(s) that individual RAs within each mining area will be available for rehabilitation, in accordance with the current LOM mining schedule. This progressive rehabilitation timing has been used to develop the PRCP schedule.

Mine infrastructure areas (including buildings, haul roads and access roads, sediment dams and mine dams) that support the active mining activities at Callide Mine will generally not be available for rehabilitation until mining activities have been completed in the relevant mining area. Some mine infrastructure areas (for example, access roads and laydown areas) will be utilised for the rehabilitation of overburden emplacement areas, and these mine infrastructure areas will therefore not be available for rehabilitation to commence until rehabilitation of overburden emplacement areas has been completed.

The primary infrastructure area for Callide Mine is located at the Dunn Creek mining area and therefore, the mine infrastructure area at Dunn Creek will not be available for rehabilitation until the end of mine life (approximately 2050 in accordance with the current LOM mining schedule).

The open-cut pit final voids will be utilised during final rehabilitation of the mine infrastructure areas (e.g. for disposing of mine affected water and contaminated soil) and therefore, the final voids will not be available for improvement to commence until the calendar year after final rehabilitation of the mine infrastructure areas has been completed.

10.3 Achievement Schedule

10.3.1 PMLUs

The timing of rehabilitation milestones specific to the achievement of surface requirements and the achievement of stable post-mining land uses (PMLUs) for bushland habitat, cattle grazing, and watercourse landforms at Callide Mine are presented in Table 38. These timeframes have been developed having regard to the risks identified in Section 7, including risks associated with landform stability and vegetation establishment.

Achievement of surface requirements for cattle grazing (RM7) is scheduled approximately 10 years following revegetation. A further five-year period is provided to demonstrate that the rehabilitated landform is capable of sustaining productive pasture and maintaining stable land condition consistent with the intended grazing land use. This timeframe allows sufficient time to assess the ongoing sustainability of the grazing PMLU through rehabilitation monitoring data, including indicators of pasture condition, groundcover, erosion stability and land capability.

Achievement of surface requirements for the bushland and watercourse PMLUs is also scheduled approximately 10 years following revegetation. A further 10-year period is provided to allow for vegetation maturation, ecological succession and natural recruitment processes to occur, and to demonstrate that the rehabilitated areas have reached a stable condition capable of supporting the intended ecosystem functions and landform stability. This timeframe recognises the longer-term processes required to establish self-sustaining native vegetation communities and stable drainage features.

Table 38: Time for achievement of surface requirements and PMLUs rehabilitation milestones

Milestone Reference	Rehabilitation Milestone	Timeframe for milestone achievement after revegetation
RM6	Achievement of Surface Requirements (Bushland)	10 years
RM7	Achievement of Surface Requirements (Grazing)	10 years
RM8	Achievement of Surface Requirements (Watercourse)	10 years
RM9	Achievement of Bushland PMLU to a stable condition (RA3, RA4)	Up to 20 years
RM10	Achievement of Grazing PMLU to a stable condition (RA5)	Up to 15 years
RM11	Achievement of Watercourse PMLU to a stable condition (RA6)	Up to 20 years

10.3.2 NUMAs

The timing of the management milestones specific to the achievement of sufficient improvement NUMAs is listed in Table 39.

Table 39: Timeframe for Management Milestones of NUMAs

Milestone Reference	Management Milestone	Milestone achievement time (in PRCP schedule)
MM1	Achievement of final landform design	5 years
MM2	Achievement of safety requirements	5 years
MM3	Achievement of sufficient improvement	Aligned with achievement of neighbouring PMLUs (RM9, RM10 or RM11) to ensure maximum monitoring period to demonstrate minimising environmental harm

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12 Abbreviations

Abbreviation	Definition
%	Percent
AHD	Australian Height Datum
AWL	Associated Water Licence
BHS	Boundary Hill South
BoM	Bureau of Meteorology
CEO	Chief Executive Officer
CHP	Coal Handling Plant
Cth	Commonwealth
CVN	Central Valley North
CVS	Central Valley South
DBH	Diameter at breast height
DESI	Department of Environment, Science and Innovation
DETSI	Department of the Environment, Science, Tourism and Innovation
DNRME	Department of Natural Resources, Mines and Energy
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development
EA	Environmental Authority
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EP	Equivalent Persons
EP Act	*Environmental Protection Act 1994* (Qld)
EP Regulation	*Environmental Protection Regulation 2019* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ERA	Environmentally Relevant Activity
ESP	Exchangeable Sodium Percentage
GL	Giga Litres
Ha	Hectare
IA	Improvement Area
km	Kilometre

Abbreviation	Definition
LOD	Land Outcome Documents
LOM	Life of Mine
m	Metre
m^3	Cubic Metre
mg/L	Milligrams per Litre
MIA	Mine Industrial Area
ML	Mining Lease
MM	Management Milestone
mm	Millimetres
mm/day	Millimetres per day
NATA	National Association of Testing Authorities
NC Act	*Nature Conservation Act 1992* (Qld)
NUMA	Non-Use Management Area
PMLU	Post-Mining Land Use
PRCP	Progressive Rehabilitation and Closure Plan
Qld	Queensland
RA	Rehabilitation Area
RAC Report	Callide Mine Report on Rehabilitation Acceptance (Completion) Criteria
RE	Regional Ecosystem
RM	Rehabilitation Milestone
RMP	Rehabilitation Management Plan
ROM	Run-of-Mine
RP	Registered Plan
RPEQ	Registered Professional Engineer of Queensland
SP	Survey Plan
TSMP	Topsoil Management Plan
VM Act	*Vegetation Management Act 1999* (Qld)
Water Act	*Water Act 2000* (Qld)