

Urquhart Bauxite Project Progressive Rehabilitation and Closure Plan

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Appendices

Appendix A- Environmental Authority EPML04313116

Appendix B- Water Management Plan

Appendix C- Erosion and Sediment Control Plan

Appendix D- Terrestrial Ecology Report

Appendix E- Rehabilitation Management Plan

Changes to Document

ITEM	Section	Description
	1 - Introduction	Update of status of mining lease to 100% Cape Commodities
Table 1-2	1.2.1 - Resource Tenures	Updated mining tenure status
	1.4 - Project Description	Update of status of mining lease to 100% Cape Commodities and Wik Timber sublease agreement
Figure 1-17	1.4 - Project Description	Updated Infrastructure area
	1.4.1 - Project Schedule	Infrastructure area changed to 1 ha
Table 3-2	3.2 - Community Consultation Register	Update of register
	6.3 - Flooding	A commitment to meet condition PRCP14 of the PRCP schedule was added.
Table 6-4	6.9.5 - Revegetation approach	Seed mix updated to include all REs proposed to be cleared.
Table 9-4	9.1.2 - Rehabilitation Monitoring	Updated Erosion classification framework to match approved PRCP schedule
Figure 10-2	10.1.1 - Rehabilitation Areas	Update of infrastructure area on the figure
Table 10-1	10.2.2 - Schedule of availability	Corrected areas of land available for rehabilitation
Table 10-3	10.4 - Milestone criteria	Updated Milestone Criteria to match approved PRCP schedule

1 Introduction

The Urquhart Bauxite Project (UBxP or the Project) is a small-scale, short duration bauxite mining project proposed by Cape Commodities Pty Ltd (Cape Commodities). The UBxP will involve strip-mining, backfilling and surface reprofiling over a five and a half-year period for the initial phase of mining Area A, then an additional year and a half for mining Area B, with the project extending to potentially seven years. The UBxP will extract approximately 6.5 million tonnes (Mt) of bauxite ore over the life of the Project.

Cape Commodities is in the process of acquiring all tenements that were previously held by the joint venture (JV) Oresome (Bauxite and Australia) and Ozore Resources. At the time of the PRCP July 2025 submission, Cape Commodities was pending as the authorised holder. Cape Commodities was granted 100% holder of ML100044 on 16 October 2025. The environmental authority EPML04313116 was transferred to Cape Commodities 20 October 2025.

The UBxP is approved to undertake Environmentally Relevant Activities (ERAs) under Environmental Authority (EA) EPML04313116. The EA became effective on 24 August 2020 and was granted without the requirement of an environmental impact statement (EIS). A transition notice for a Progressive Rehabilitation and Closure Plan (PRC Plan) was issued by the Department of Environment, Tourism, Science and Innovation (DETSI) requiring a PRC Plan to be submitted to the DETSI by 29 November 2024. Version 3.0 of the PRC Plan provides further clarity in response to information requested by DETSI (issued 28/01/2025 for resubmission by 28/07/2025). This version (V3.1) is the amended rehabilitation planning part required to be submitted following the issuance of the final PRCP schedule and contains minor changes to V3.0 as listed in the changes to document table on the previous page.

This PRC Plan has been developed in accordance with Sections 126C and 126D of the Environmental Protection Act 1994 (EP Act) and to meet the requirements specified in the DETSI's Progressive Rehabilitation and Closure Plans Guideline (ESR/2019/4964 version 3.01). As per the guidelines, this PRCP plan comprises two main components. The rehabilitation planning component (Sections 1 to 9) provides information on the characteristics of the site, legislative requirements, stakeholders, post-mining land use, rehabilitation goals, rehabilitation methodology, risk assessment and monitoring program. The PRC Plan schedule component (Section 10) provides a final site design and a detailed schedule of progressive rehabilitation activities including rehabilitation milestones.

This PRC Plan presents Cape Commodities' strategy for managing UBxP's activities in a way that maximises the progressive rehabilitation of the land to a safe and stable condition, as well as specifying the condition to which Cape Commodities will rehabilitate the land before the EA is surrendered.

1.1 Project Location

The UBxP tenement is located on the Cape York Peninsula, approximately seven (7) kilometres (km) south-west of the township of Weipa and five (5) kilometres (km) west of the community of Napranum in North Queensland, Australia at the mouth of the Embley River as it enters Albatross Bay (**Figure 1-1**).

The site is located within the Aurukun Shire Council and the Napranum Aboriginal Shire, within Aboriginal Freehold land (Wik and Wik Waya Peoples) (**Figure 1-2**). Ancillary and Compensation Agreements are in place between Oresome Bauxite Pty Ltd, Ozore Resources Pty Ltd and the Wik and Wik Waya Peoples prescribed body corporate, the Ngan Aak Kunch (NAK) Aboriginal Corporation RNTBC. A deed of assignment and assumption has been submitted for signing with the NAK board regarding the change from the JV to Cape Commodities.

Access to the site will be via a dedicated access and haul road which will traverse approximately 9 km across Rio Tinto Mining Lease (ML) 7024 tenement to the east of the UBxP and approximately one (1) kilometre across freehold land at Hey Point (Lot 12 on Plan SP266627) currently leased by Wik Timbers. Agreements are currently being finalised with Rio Tinto Aluminium Weipa, Wik Timbers and Ngan Aak Kunch Aboriginal Corporation for access.

1.2 Site Description

1.2.1 Resource Tenures

The UBxP will operate on ML 100044, which was granted on 2 January 2018, covering an approximate area of 1,360 hectares (ha). Oresome is the authorised holder of the lease, with the transfer to Cape Commodities decision assessment currently in progress. The site is abutted to the east by Rio Tinto Amrun bauxite mine (ML 7024). The site is bounded to the west by Roberts Creek, and the mouth of the Hey and Embley Rivers to the north. To the south lies native title freehold land and Triluck Creek.

A list of the properties, tenure, usage and owners/managers within the ML boundaries are provided in **Table 1-1**.

Table 1-1 Land Tenure and Real Property Descriptions for the UBxP

Lot/Plan	Segment/Parcel	Tenure	Usage	Owner	Area (ha)
213/SP241407	357727	Freehold	Managed resource protection.	Aurukun Shire Council	902.97
10/SP266623	36785002	Freehold	Managed resource protection.	Napranum Aboriginal Shire	456.64

The UBxP is located within a relatively undisturbed area, although the dominant native vegetation on site exhibits limited structural complexity, most likely due to the extensive fires that affect the area biannually (NAFI, 2025). Nearby areas in the Weipa region were historically used for cattle grazing on unimproved pastures, although stocking rates were low, and it is unlikely that the Project area was subjected to significant grazing pressure (Winter & Atherton, 1985). There are no conservation reserves, stock routes, easements or public road reserves within the Project area. No additional land tenures than those described above would be affected by the Project.

An Exploration Permit (EMP 15268), held by Oresome Australia Pty Ltd, occurs across the mining lease. Mining tenures potentially relevant to the UBxP are listed in **Table 1-2** and are shown in **Figure 1-1**.

Table 1-2 Relevant mining tenures

Tenure Identification	Description	Area	Expiry date of tenure
ML100044	Cape Commodities Pty Ltd.	1,360 ha	31/01/2033
ML7024	Rio Tinto Aluminium Weipa Pty Ltd (RTAW) – Amrun Project. Cape Commodities are in the process of negotiating a sublease across ML7024.	242,473.3 ha	31/12/2041
ML20669/ML20737	ML held by Cape Commodities Pty Ltd (Urquhart Point Mineral Sands). Potential alternative haulage route to export point. Route has been agreed between parties but would require amendment to ML20669/ML20737 conditions and EA EPML00612113.	366.1 ha	Renewal application currently under assessment

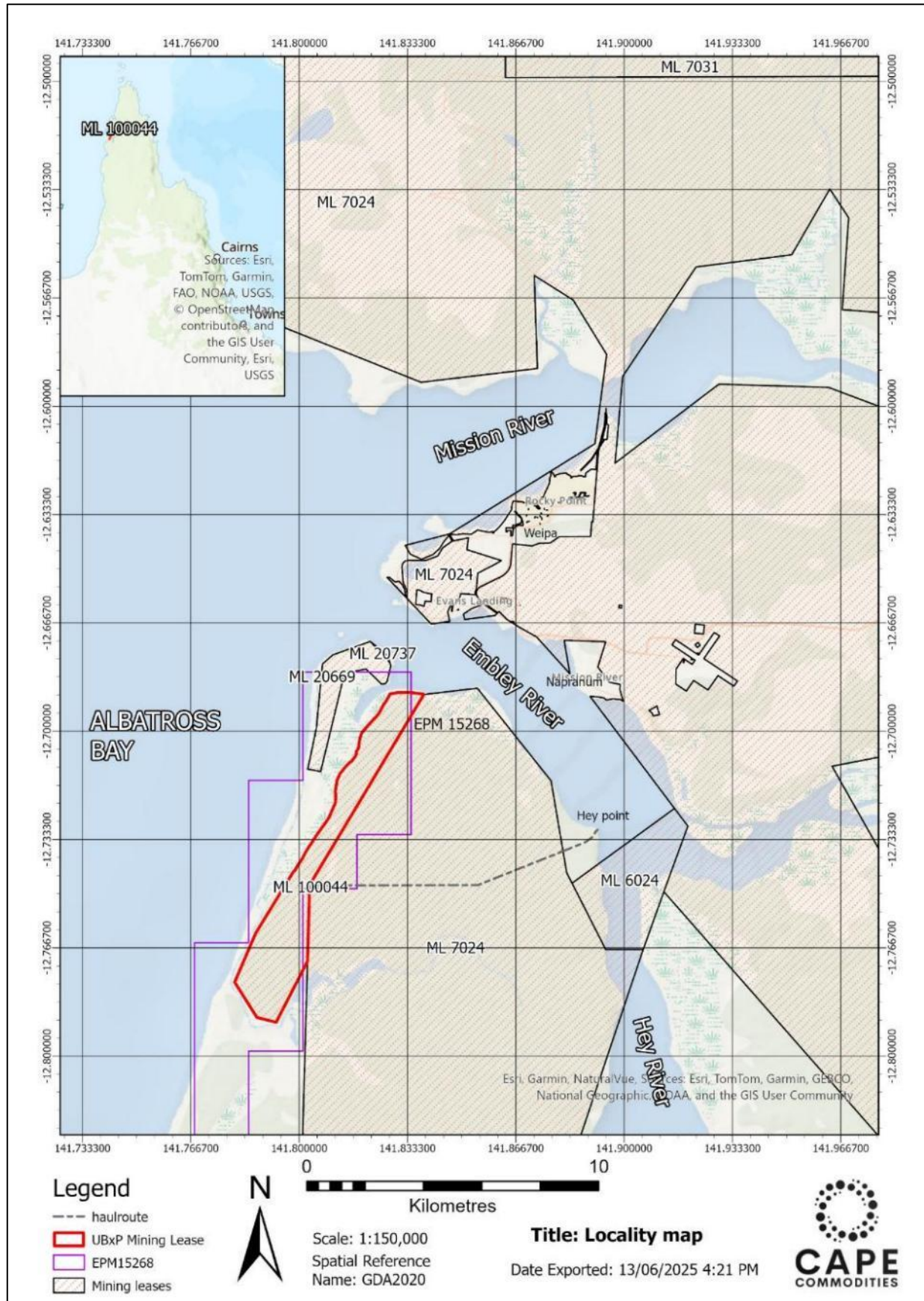


Figure 1-1 Regional Locality of Urquhart Bauxite Project

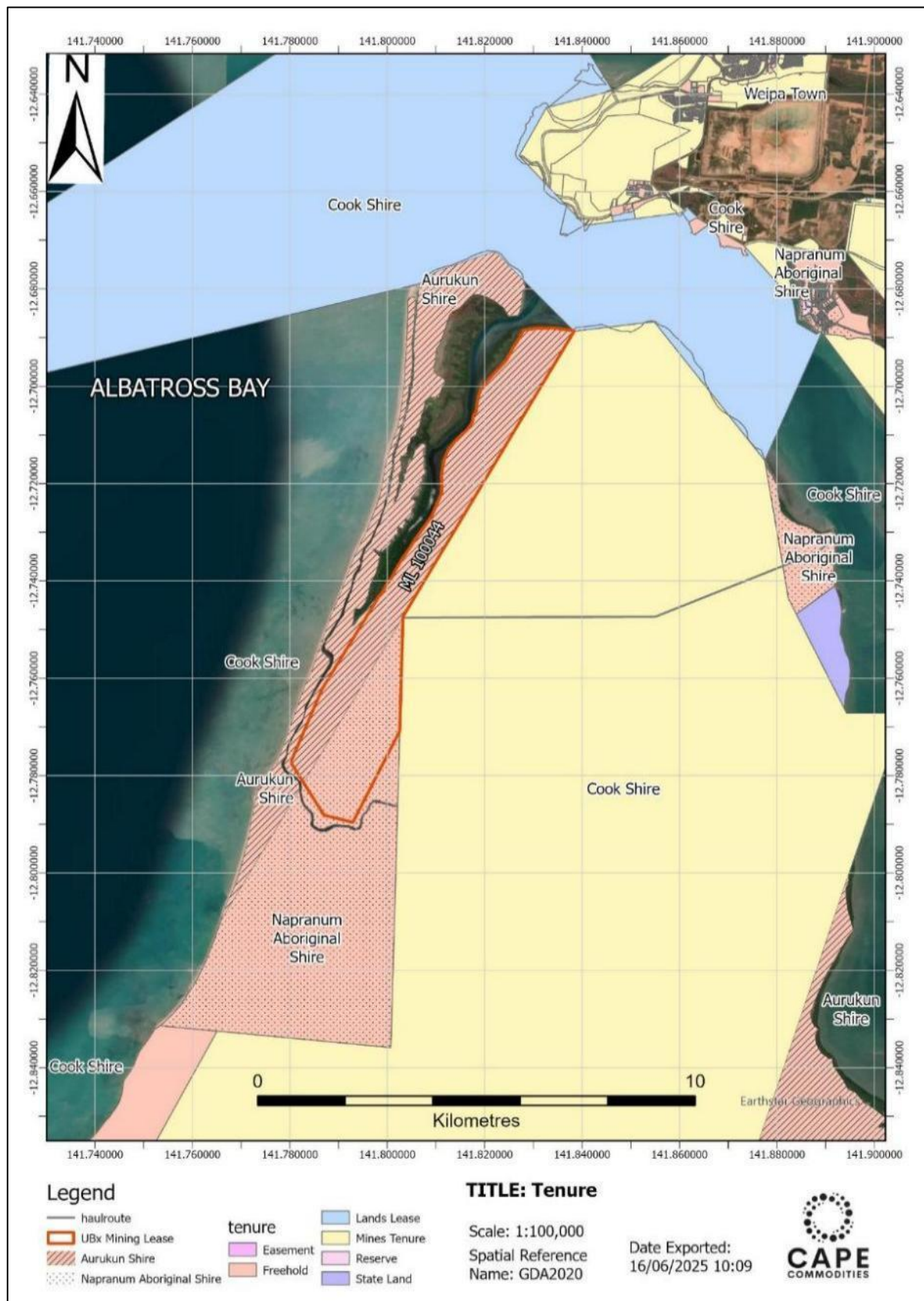


Figure 1-2 Local Government Areas and tenure

1.2.2 Landholders

The registered owners are the Aurukun Shire Council and Napranum Aboriginal Shire but is part of an *Aboriginal Land Act 1991* freehold package to the Wik and Wikwaya People. Native Title has been determined to be held by the Wik and Wikwaya People. The prescribed Body Corporate is Ngan Aak Kunch (NAK) Aboriginal Corporation.

The Aurukun Shire Council planning scheme provides a framework for managing land use and development within the Aurukun Shire, ensuring it aligns with the community's needs and aspirations. It aims to empower the council and the community to have a say in the future of their land, rivers, and sea, fostering sustainable development that benefits the people of Aurukun. Under the planning scheme, the area is mapped in an Environmental Management and Conservation Zone. Section 6.2.2.2 of the planning scheme outlines that the purpose of the Environmental Management and Conservation Zone code is to provide for the protection and maintenance of areas identified as supporting significant biological diversity and ecological integrity. The purpose of the code will be achieved through the following overall outcomes:

- a) The zone provides for low intensity development, based on an appreciation of the significant environmental and cultural values of the area, only where a community need can be demonstrated to locate outside of the Township Zone and environmental impacts can be avoided or mitigated.
- b) Areas identified as having significant values for biological diversity, water management, ecological functioning, coastal management and historical or cultural purposes are protected from the impacts of development.
- c) Development is appropriately setback from natural features (such as creeks, gullies, waterways, wetlands and native vegetation) so that adverse impacts on ecological processes and historical or cultural values are avoided.
- d) Development is located outside of areas subject to landslide to protect public health and safety and the integrity of essential infrastructure.
- e) Development maintains public access to the foreshore and facilitates opportunities for recreational and cultural use of the coastal environment.
- f) Development within the zone is self-sufficient and designed to incorporate sustainable practices and climate responsive design.
- g) Small scale rural living opportunities (such as outstations and low impact animal husbandry activities) are provided for, where compatible with existing environmental values.
- h) Mining or extractive activities (including support activities such as materials storage and supply, maintenance activities and commercial services) are appropriately located to maximise positive social and economic benefits for the community and minimise environmental impacts.
- i) Eco-tourism and recreation activities, based on an appreciation of the cultural or environmental heritage features of the Aurukun Shire, may be provided for where the use does not detrimentally affect the existing environmental values of the area.

Under the Napranum Aboriginal Shire planning scheme, the area is zoned rural. Under section 6.2.2 (1) of the planning scheme, the purpose of the rural zone code is to:

- (a) provide for a wide range of rural uses including cropping, intensive horticulture, intensive animal industries, animal husbandry, animal keeping and other primary production activities;
- (b) provide opportunities for non-rural uses that are compatible with agriculture, the environment, and the landscape character of the rural area where they do not compromise the long-term use of the land for rural purposes;
- (c) protect or manage significant natural features, resources, and processes, including the capacity for primary production.

1.2.3 Topography

The UBxP is located on the southern bank of the Embley River, which is 2.6 km wide in the vicinity of the Project area. The UBxP is bounded by the Embley River to the north, Roberts Creek to the west and Triluck Creek to the south. All of the waterways bordering the site are mangrove-lined, tidal estuaries. The Project area consists of gently undulating bauxite plateaus and sand dunes, which slope towards the estuarine creeks. In the swales and at the landward edge of mangroves, the seepage of groundwater creates localised wetlands. The highest point of the site is 16 m above sea level, with the mining footprint occurring at or above six (6) m Australian Height Datum (AHD) (**Figure 1-3**). Elevations within and surrounding the Project range from 0 m AHD at the coast to around 50 m AHD at the top of the catchment. Elevations within the Project area are generally between 10 m and 14 m AHD, with the infrastructure area located at 12 m AHD. The upper reaches of many of the rivers and creek systems in the Embley River Drainage Sub Basin are non-perennial systems, whereas the lower lying reaches are subject to tidal influences. Creeks are generally seasonal, and groundwater fed, supporting isolated perennial pools/lagoons.

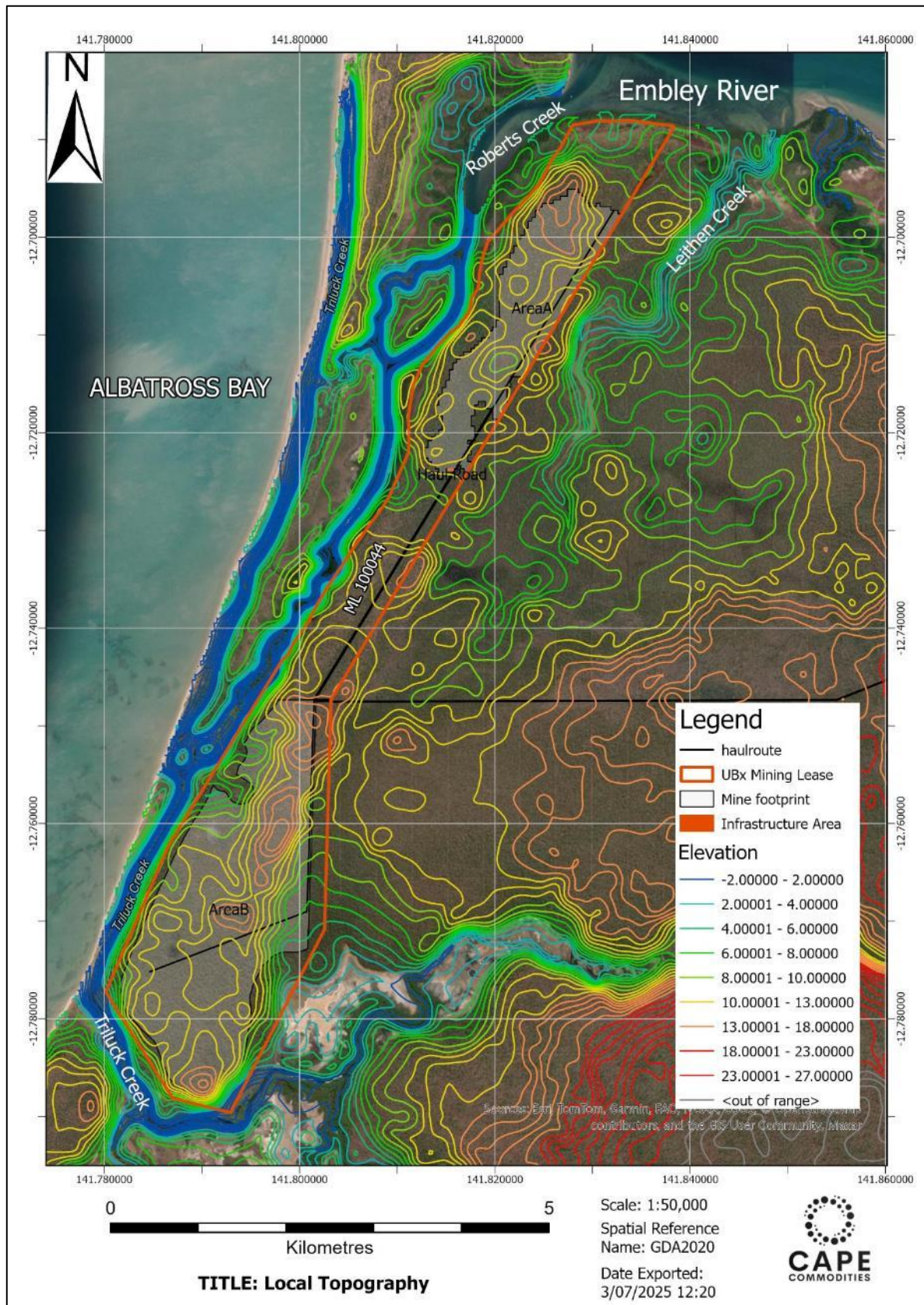


Figure 1-3 Surface Topography and UBxP infrastructure area

1.2.4 Climate

The site is located in the tropics of northern Queensland. This region is influenced by the monsoon. It has two distinct seasons, a wet season in the warmer months of the year, and a dry season in the cooler months. The wet season is characterised by high rainfall periods between November and April. Cyclonic storms also regularly occur during this season. The dry season occurs between May to October. During this season, rainfall is minimal.

The closest Bureau of Meteorology (BOM) weather station is the Weipa airport (BOM station 27045), located 10 km to the east of the site. The highest daily rainfall for the area was recorded in January 2013 at 356.0 mm, with a mean average rainfall of 1966.1 mm between the years 1990 and 2024. During May to October, the mean rainfall is approximately 50 mm, with May and October averaging approximately 20 mm and June to September receiving less than 5 mm per month. January and February tend to be the wettest months averaging around 500 mm per month (**Figure 1-4**).

Average temperatures within the Weipa region are relatively consistent throughout the year with the highest daily average temperatures ranging between 31.1°C in the dry season months of June/July to 35.9°C at the onset of the wet season in October/November (**Figure 1-5**), with the highest daily temperature recorded in October 2022 at 40.1°C. Lowest mean daily temperatures range from 18.9°C in August during the dry season to 24.3°C during the wet season in December to February. The lowest daily temperature was recorded in June 2007 at 10.2°C.

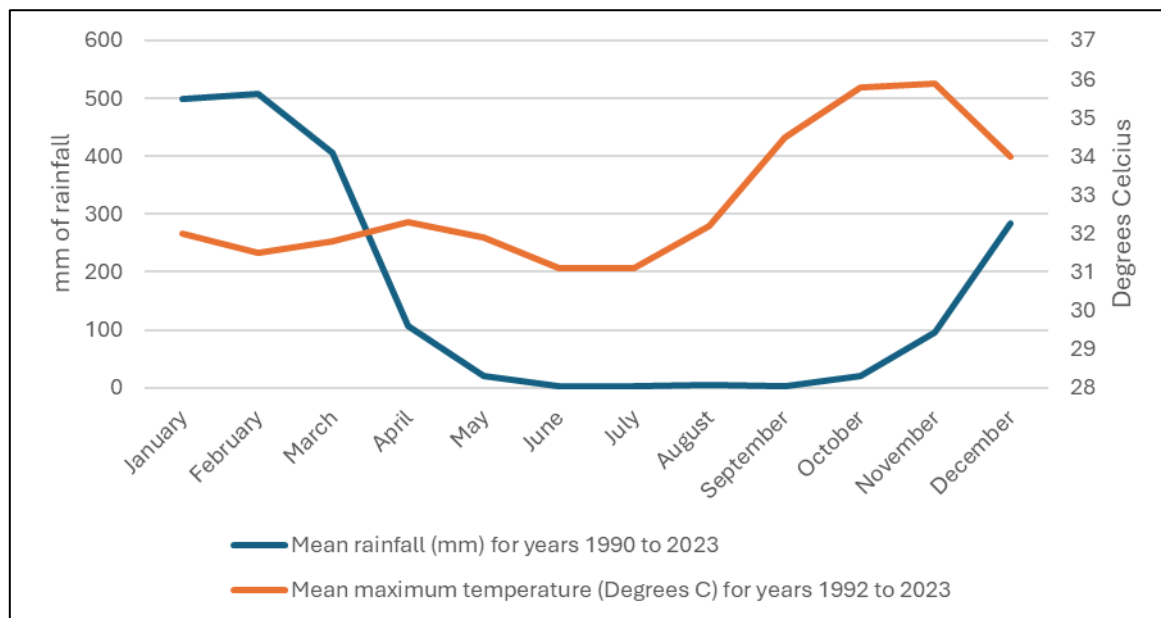


Figure 1-4 Monthly average rainfall and temperatures at Weipa airport (BOM station 27045)

The annual daily evaporation rate averages 6.6 mm. The highest rate of evaporation occurs in the late dry season (September-October) (**Figure 1-5**). The total annual evaporation (from bare ground or open water) is between 2,000–2,400 millimetres (mm), which is slightly higher than the average annual rainfall of 1,960 mm.

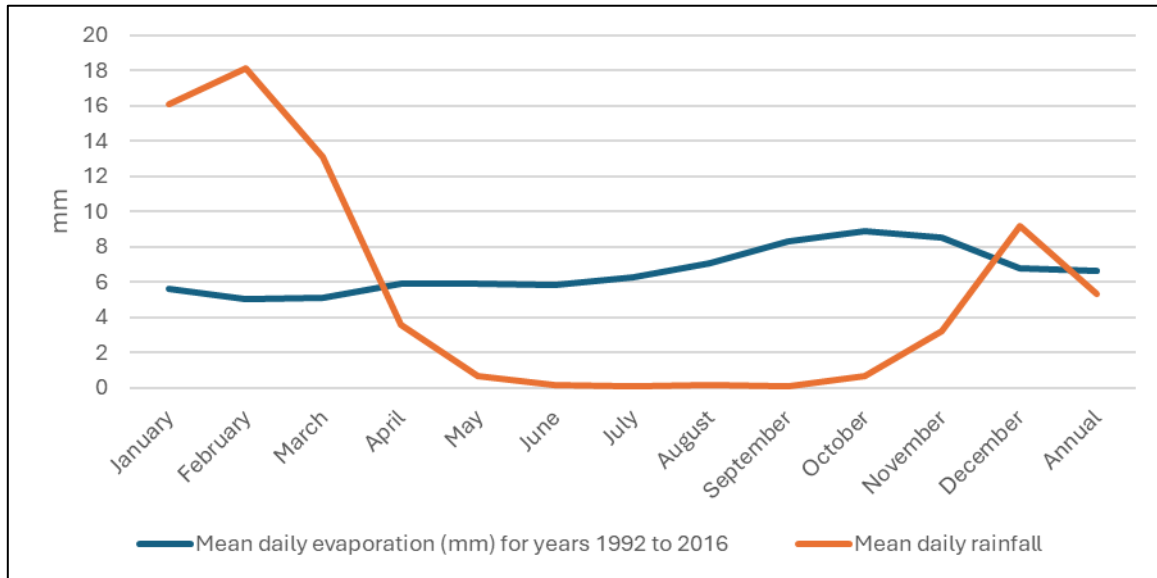


Figure 1-5 Average daily rainfall and evaporation per month at Weipa airport (BOM station 27045).

In the dry season, the region tends to have average winds of up to 19.2km/h, tending south-east to easterly. Over the wet season, the winds are generally lighter and are westerly to north-westerly in direction. Strong to gale force winds occasionally occur, but usually in association with a tropical cyclone.

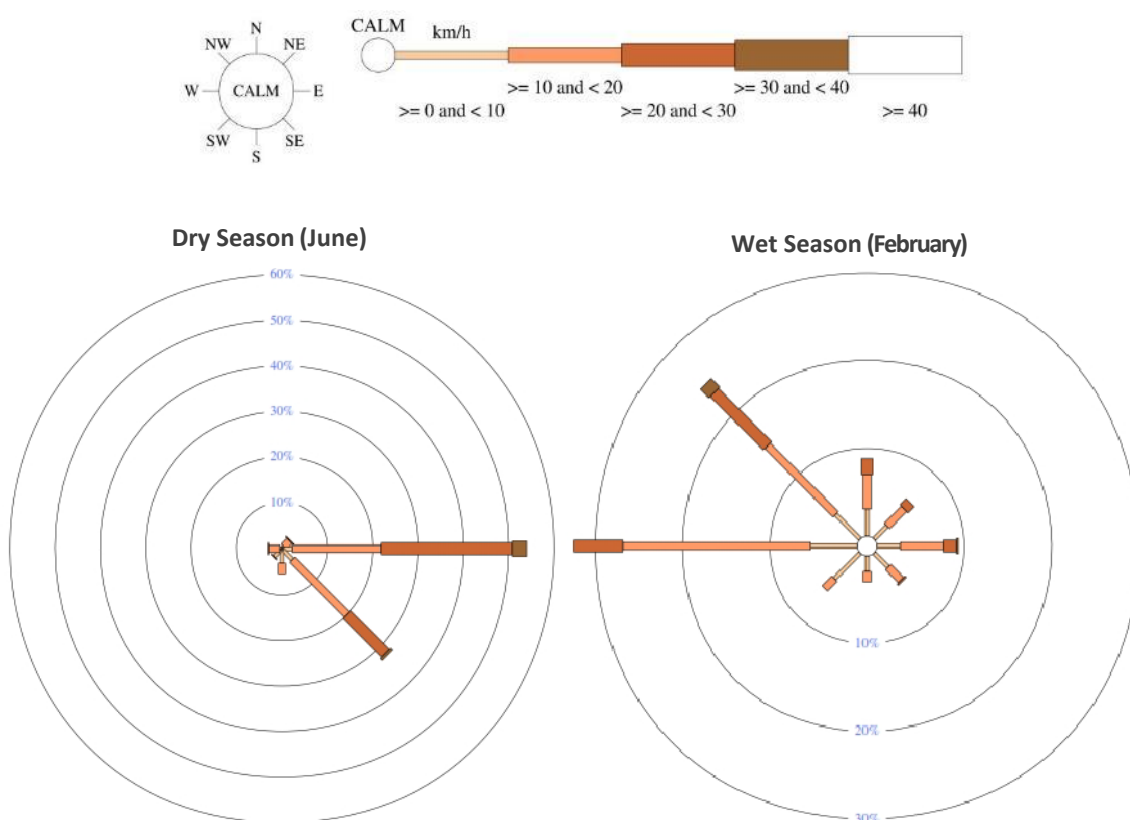


Figure 1-6 Representative wind roses for the dry and wet seasons at Weipa Airport (BoM station 27045). Data is from 3pm, when wind is typically highest

Climate change models (CSIRO, 2015a) suggest with medium confidence that average winter and spring rainfall will decrease over the next 80 years. While changes in summer and autumn rainfall are also possible, their direction is uncertain. In the short term, natural rainfall variability is expected to outweigh trends from increasing greenhouse gas emissions, making current rainfall data (**Figure 1-5**) most relevant for the UBxP during rehabilitation and vegetation establishment. Over the long term, extreme rainfall events are projected to intensify and drought duration to increase, which may result in a change of species composition over time.

Temperature changes are projected to be more pronounced in the near term compared to rainfall. By 2030, annual average temperatures are expected to rise by 0.5 to 1.4 °C above the 1986–2005 average, and the current climate (as of late 2019) is already 0.24 °C warmer. By 2090, temperatures could increase by 1.3 to 5.0 °C. These temperature changes will affect both the vegetation establishment phase and the long-term survival of trees. The species chosen for revegetation have wide geographic distributions, including hotter and drier regions, so it is unlikely that the UBxP area represents their environmental tolerance limits.

1.2.5 Geology

The geology of Cape York Peninsula consists primarily of younger sedimentary basins, which cover a north-south orientated spine of Proterozoic and Paleozoic rocks (Taylor et al., 2008). The site is located within two main physiographic units: the Weipa Plateau and the Mapoon Plain.

The Weipa Plateau is a remnant of the modified Cretaceous regression surface along the western side of the Peninsula. It rises from about five metres at the coast to around 50 m at its eastern margin, with some local variations. This plateau is the focus of Rio Tinto's bauxite mining operations in the region. The drainage pattern is dendritic, with broad, shallow streams sparsely distributed across the area. Major river valleys have been drowned at the coastline due to the Holocene sea-level rise. The plateau is underlain by the Bulimba Formation and capped by resistant bauxite and aluminous laterite.

Further north, along the coast north of Albatross Bay, the narrow Mapoon Plain has formed from the deposition of eroded materials. It consists of younger beach sand ridges, backed by black soil plains and clay flats, with a few salt pans (Smart, 1977). These aeolian sand ridges are generally low, elongated, and shore-parallel, composed mostly of very fine sand. Beneath these ridges is a more heterogeneous deposit, including coarse sand, bauxite, ironstone nodules, and both fragmented and whole shells, which are similar to beach ridge plains observed elsewhere in the Albatross Bay region. The presence of shells may indicate past shoreline retreats due to recent sea-level rise.

The Project area lies within the Carpentaria Basin, a Mesozoic intracratonic basin that covers approximately 560,000 km² (including 380,000 km² offshore). The basin consists of marine and fluvial siliciclastic sediments and sedimentary rocks and is underlain by a heterogeneous, crystalline basement of Proterozoic to Paleozoic rocks.

Superimposed on the Carpentaria Basin is the shallow, Cenozoic Karumba Basin, which covers much of the western and northern parts of the Cape York Peninsula. The Bulimba Formation unconformably overlies the Karumba Basin. This formation consists of widely distributed clastic units, including claystones, quartzose sandstones, granule conglomerates, siltstones, and minor coal. It is considered to be Paleogene in age, though its precise timing is poorly constrained.

The Bulimba Formation deposition was followed by erosional planation and deep weathering, leading to the formation of the Aurukun Surface. This surface is characterized by deep laterites and sporadic silcretes across the Karumba Basin. The Aurukun Surface hosts the economic bauxite ore that will be mined as part of the Project (**Appendix B**).

The site itself is primarily composed of Holocene sand deposits, which overlie the bauxite deposit. At the southern end of the lease, some late Tertiary-Quaternary aluminous laterite can be found. **Figure 1-7** presents the surface geology mapped across the UBxP area.

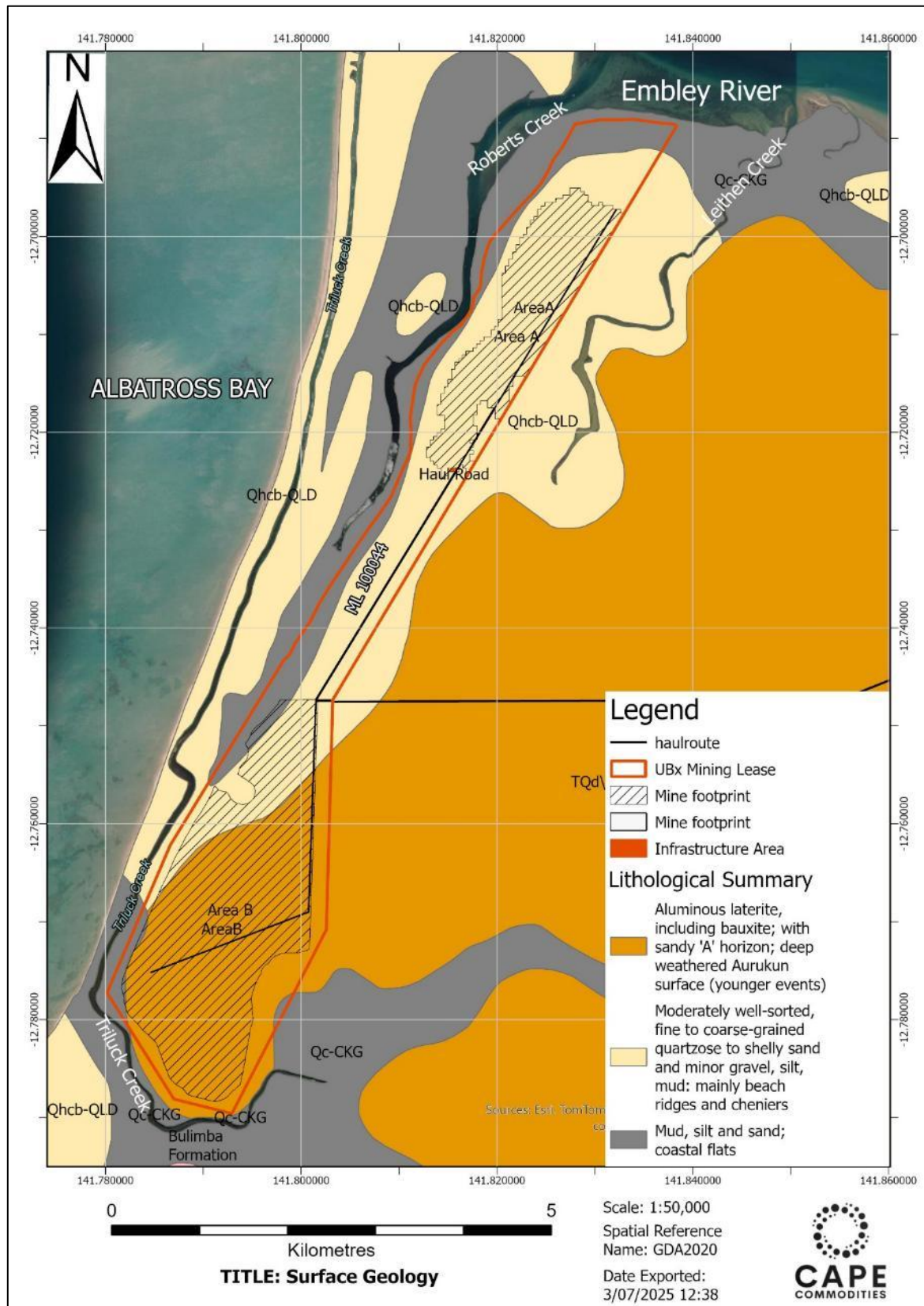


Figure 1-7 Surface geology of the region

1.2.6 Hydrology

The UBxP features a network of small, temporary coastal creeks, which are drained by two main flow paths. Many of the rivers and creeks in the Embley River Drainage Sub Basin are non-perennial in their upper reaches, while the lower sections are influenced by tidal changes. These creeks are generally seasonal and rely on groundwater, which supports isolated ephemeral pools and lagoons. Ephemeral surface water bodies typically flow only during the wet season, from December to March. Following heavy rainfall, most of the water either evaporates quickly or seeps into the ground, resulting in limited standing water. There are no perennial watercourses within the site (**Figure 1-8**).

To the north of the UBxP lies the estuarine Embley River. The project area itself consists of undulating bauxite plateaus and sand dunes that gradually slopes toward the estuarine creeks, with elevations typically ranging from 0 to 14 metres above Australian Height Datum (mAHD). In the swales and at the landward edge of the mangroves, groundwater seepage creates localised wetlands. For example, seepage at the edges of sand dunes along Roberts Creek and Triluck Creek supports small, ephemeral wetlands at the mangrove borders. These wetlands are crucial water sources for local fauna.

Larger palustrine wetlands are present in the far southeast and northeast of the UBxP area, with the latter mapped as a wetland on the Vegetation Management Wetlands map. Field verified RE mapping identified that mapped wetland and associated vegetation is restricted to the northern area of the lease, outside the clearing footprint. Freshwater creeks are absent from the project area, and all surrounding waterways are mangrove-lined tidal estuaries.

The UBxP catchment drains into several bodies of water, including Triluck Creek, Roberts Creek and Leithen Creek (**Figure 1-9**). These receiving waters are estuarine and influenced by the marine waters of Albatross Bay and the Arafura Sea in the Gulf of Carpentaria.

Leithen Creek is a minor non-perennial creek (order 2) on the eastern side of the lease, outside the mining lease boundary (see **Figure 1-9**). Additionally, an unmapped intermittent stream extends from a seasonal swamp and flows east to the coast at the mouths of the Hey and Embley Rivers during the wet season.

In accordance with Section 126D (3) of the EP Act, floodplain modelling is required for any voids located wholly or partly within a floodplain to ensure stability after rehabilitation. The UBxP does not propose to retain any voids within a classified floodplain, hence no floodplain modelling has been conducted. Refer to **Section 6.4.2** for further details.

Figure 1-8 and **Figure 1-9** illustrate the regional and local hydrology in relation to the UBxP mining infrastructure.

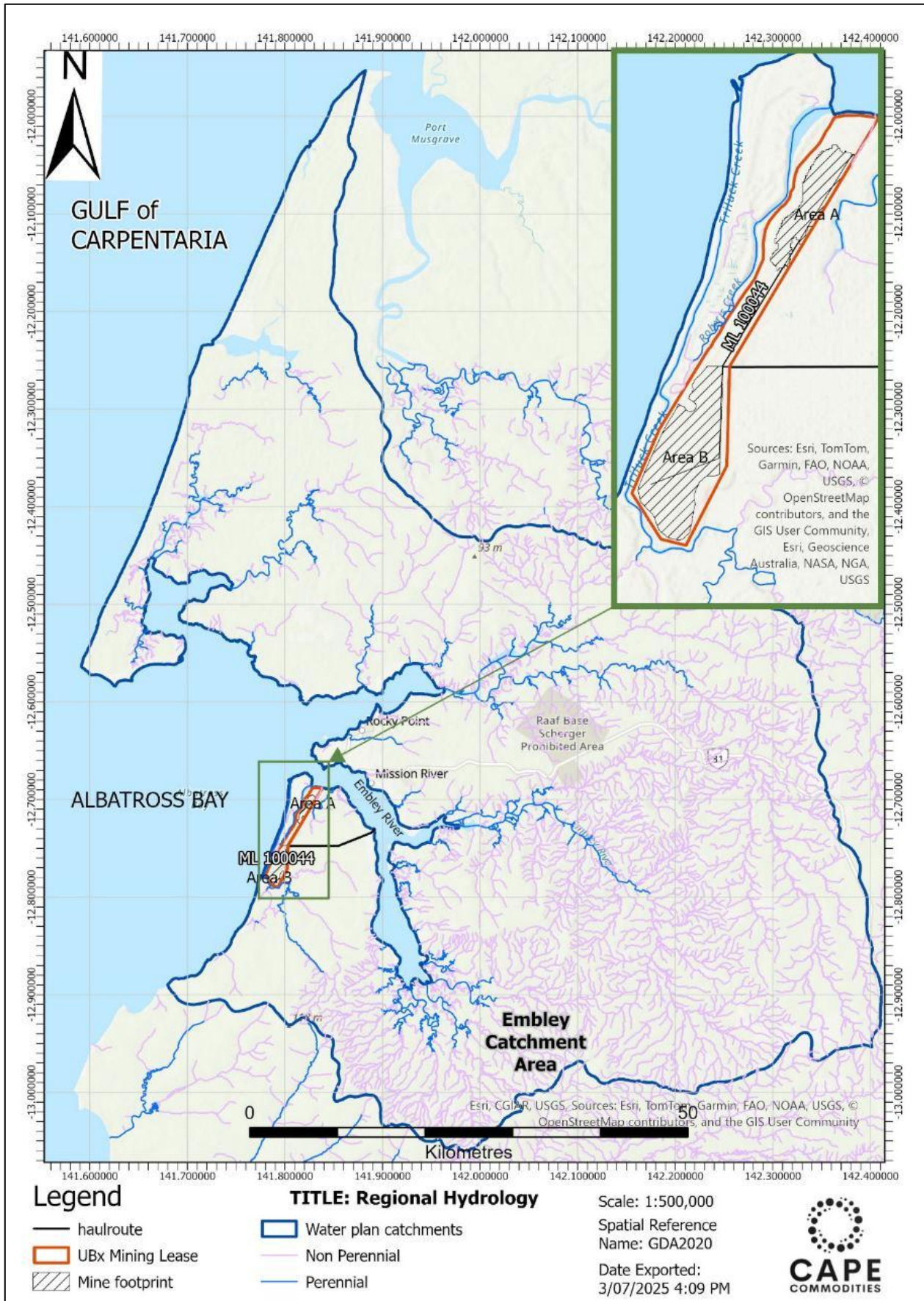


Figure 1-8 Regional Hydrology

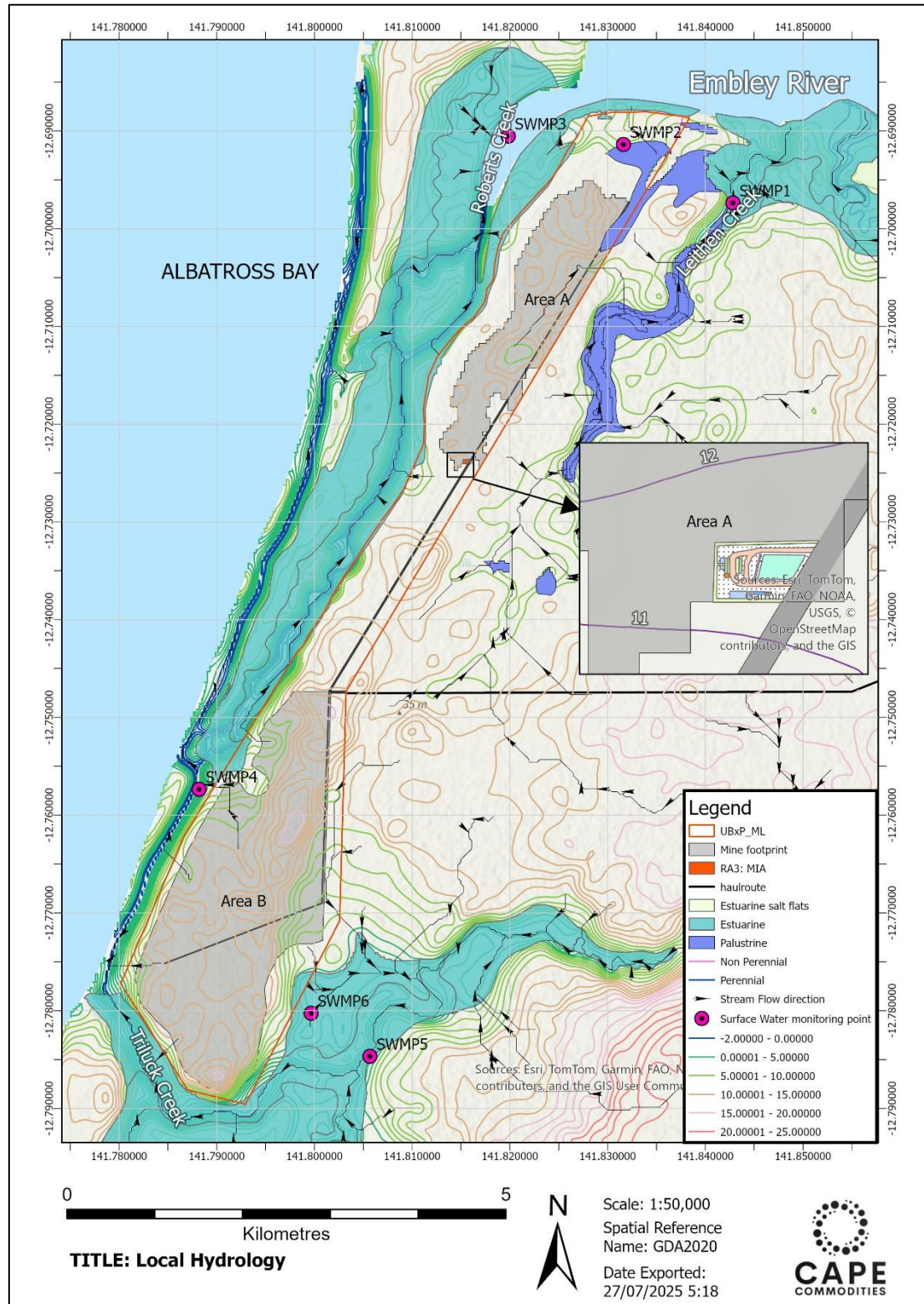


Figure 1-9 Local Hydrology

Surface water quality

Background surface water quality data from several sources including the following:

- Baker R. and Sheppard R. (2006). Fisheries resources of Albatross Bay, Gulf of Carpentaria;
- Larcombe, P. and Taylor, J. (1997). Port of Weipa Water and Sediment Quality Monitoring Baseline Surveys; and
- Baseline water quality monitoring conducted by VDM Consulting in 2012 from 16 surface water monitoring comprising of both fresh and estuarine locations (VDM, 2012).

Both the Baker and Sheppard (2006) and Larcombe and Taylor (1997) reports have questioned the suitability of ANZECC guidelines for this region. They suggest that further research is needed to establish local guidelines to better protect the aquatic ecosystems in the Albatross Bay area. Key findings from these studies regarding regional water quality include:

- pH were generally within ANZECC guidelines;
- Dissolved Oxygen (DO) concentrations were consistently below ANZECC guidelines, which are considered inappropriate for the region;
- Petroleum hydrocarbons were detected in high levels in water samples collected adjacent to nearby mining operations and sewage outlets;
- Nickel, copper, zinc and lead all exceeded guideline values at many locations. Guideline values may be inappropriate; however, elevated metal concentrations are a common indication of pollution from mining and port operations; and
- Turbidity exceeded at numerous locations and may be influenced by neighbour mining operations' wastewater discharge regime.

Baseline surface water quality monitoring was completed in late 2015 at six sites across the project area. These surface water monitoring sites are provided in **Table 1-3** and displayed in **Figure 1-9**. Six sites have been conditioned as part of the UBxP's EA.

Table 1-3 Baseline surface water monitoring sites

Monitoring Point	Description	Coordinates (GDA94 MGA Z55)	
		Easting	Northing
Upstream reference monitoring points			
Monitoring point 1 (SWMP1)	Located at the lower reaches of creek located in Sub catchment 1, measuring upstream effects from the mining of Area A (boat access).	591509	8596182
Monitoring point 2 (SWMP5)	Located at Triluck Creek measuring water quality im mediately upstream of mining Area B (overland access).	587445	8586539
Monitoring point 3 (SWMP6)	Freshwater wetland/swamp (non-tidal) located at Triluck Creek measuring water quality immediately upstream (southeast) of mining Area B (overland access).	586793	8587028
Downstream monitoring points			

Monitoring Point	Description	Coordinates (GDA94 MGA Z55)	
		Easting	Northing
Monitoring point 4 (SWMP2)	Located between SWMP1 and SWMP3 in a state mapped palustrine wetland area fed by runoff from Sub catchment 1 and Roberts Creek Catchments measuring immediate downstream effects from the mining of Area A (overland access).	590294	8596847
Monitoring point 5 (SWMP3)	Located at the mouth of Roberts Creek measuring immediate downstream effects from the mining of Area A and distant downstream effects from the mining of Area B (boat access).	589014	8596946
Monitoring Point 6 (SWMP4)	Located at Triluck Creek measuring downstream effects from the mining of Area B (overland access).	585793	8587028

Surface water samples collected from monitoring points were significantly influenced by the marine environment, typically recording pH levels ranging from neutral to slightly alkaline, with a maximum pH of 8.2 at SWMP3. In contrast, the surface water samples from monitoring point SWMP5 were more neutral to slightly acidic, with pH values between 5.1 and 7.4, likely due to groundwater discharge. The mean pH of marine waters was measured at 7.3, which is slightly below the ANZECC range of 8 to 8.4 for tropical Australia. Estuarine waters showed a wider pH range of 5.1 to 7.9, influenced by seasonal freshwater inflows (with an ANZECC range of 7 to 8.5).

Mean turbidity levels ranged from 2.9 to 15.9 NTU for estuarine waters and 3.7 to 10.1 NTU for marine waters. According to ANZECC Guidelines, the acceptable turbidity range for both estuarine and marine environments in tropical Australia is 1 to 20 NTU, indicating that the UBxP sites fall within this range. However, the guidelines also state that turbidity is not a particularly useful indicator in estuarine and marine waters.

Elevated sediment and turbidity levels were noted near the mouth of the Embley River. No runoff was detected during monitoring, with the higher turbidity levels likely due to tidal influences in the estuary that can mobilise fine sediments within the water column (OzCoasts, 2011). Natural turbidity is mainly affected by sediment re-suspension, deposition, and advection. Albatross Bay is often described as naturally turbid, particularly during the wet season when surrounding estuaries and waterways discharge plumes of brackish, turbid water into the Bay (SKM, 2009). Importantly, even at these elevated levels, the turbidity measurements remained below ANZECC thresholds.

Maximum total concentrations of arsenic, cadmium, lead, nickel, and zinc were all below the default ANZECC/ARMCANZ Guideline trigger values for marine and estuarine systems. Specifically, all metals recorded were under these guideline thresholds.

In marine systems, the highest concentrations noted were 0.03 mg/L for total phosphorus and 0.24 mg/L for total nitrogen, both of which are well below the ANZECC Guideline levels of 15 mg/L for total phosphorus and 100 mg/L for total nitrogen.

In estuarine systems, the highest recorded concentrations were 110 mg/L for total phosphorus and 2.1 mg/L for total nitrogen. The ANZECC Guideline levels for estuarine environments are 20 mg/L for total phosphorus and 250 mg/L for total nitrogen, meaning that total phosphorus was the only parameter exceeding the ANZECC thresholds for tropical Australia. Nonetheless, these levels align with findings from previous studies of Albatross Bay (Burford & Rothlisberg, 1999).

Typically, during the dry season, there is minimal freshwater movement, resulting in low and unevenly distributed nutrient levels in the water. To obtain more accurate nutrient data, testing is planned for the end of the wet season, when nutrient levels are expected to be more representative.

1.2.7 Hydrogeology

The groundwater resources within the region have been differentiated as shallow aquifer and artesian aquifer resources. The shallow aquifer resources are hosted within the Bulimba Formation which overlies the confining shales and siltstones of the Rolling Downs Group. The artesian resources are hosted within the Gilbert River Formation and Garraway Beds. Near the UBxP, groundwater available has been characterised as a highly permeable and ephemeral shallow groundwater system, with distinctive but seasonal discharges into the wet/marshlands, mangroves and sea. Infiltration following rain events is large and rapid. The shallow groundwater system is underlain by a deeper saline aquifer system. The fresh/saline interface was recorded at around 1.0 m below sea level, particularly at the northern and southern ends of the site. A third groundwater system, perched aquifers, can be defined in the upper horizons of the Bulimba Formation within the Kaolinite and possibly within the bauxite. The water quality characteristics of the UBxP area reflect the nature of water flowing through and within bauxite terraces, with the ferro aluminosilicate matrix of the laterite layers acting as a physical and chemical filter for particulates resulting in very clear, almost salt-free surface waters (Greencap, 2015).

The local coastal dunes, estuarine and delta deposits do not serve as a viable groundwater resource, as extraction would be difficult due to the fine-grained nature of the sediments. The presence of saline groundwater and risk of saltwater intrusion exclude the long-term utilisation of the coastal aquifers. The shallow aquifers on the site have been investigated through groundwater level monitoring and aquifer parameter tests.

Three shallow monitoring bores were established in the upper sand / bauxitic gravel aquifer in late November 2015 and three deeper monitoring bores were constructed in the Bulimba Sandstone on 17 and 18 December 2015. Groundwater monitoring bore construction details are outlined in **Table 1-4**, with the locations displayed in **Figure 1-10**. A schematic geological diagram showing the specific geology within which the UBxP monitoring bores are situated is presented in **Figure 1-11**.

Groundwater levels were manually recorded in monitoring bores in December 2015, and in February, March, April, May and June of 2016. In addition, continuously recorded groundwater level data were obtained for three bores since mid-December 2015 using Solinst dataloggers. The results of the continuous recording of groundwater levels are illustrated in **Figure 1-12** as hydrographs.

Table 1-4 Groundwater bore construction details

Monitoring bore	Easting	Northing	Surface RL (m) ^{1,2}	Screen(s) RL (m)	Depth RL (m) ⁴
Shallow Aquifer					
GWMB05S	586748	858730	3.93	2.43 to -0.57	-0.57
GWMB06S	586094	8589366	3.14	0.14 to -2.86	-2.86
GWMB07S	585147	8587156	4.89	3.19 to -0.61	-0.61
Deep Aquifer					
GWMB1D	590235	8596137	3.86	-9.14 to 10.64	-10.64
GWMB2D-a	589780	8595997	6.05	-10.45 to -11.95	-11.95
GWMB3D	588584	8594119	4.4	-9.1 to -10.6	-10.6

1-Monitoring is not required where a bore has been removed as a direct result of the mining

2-RL must be measured to the nearest 5 cm from the top of the bore casing.

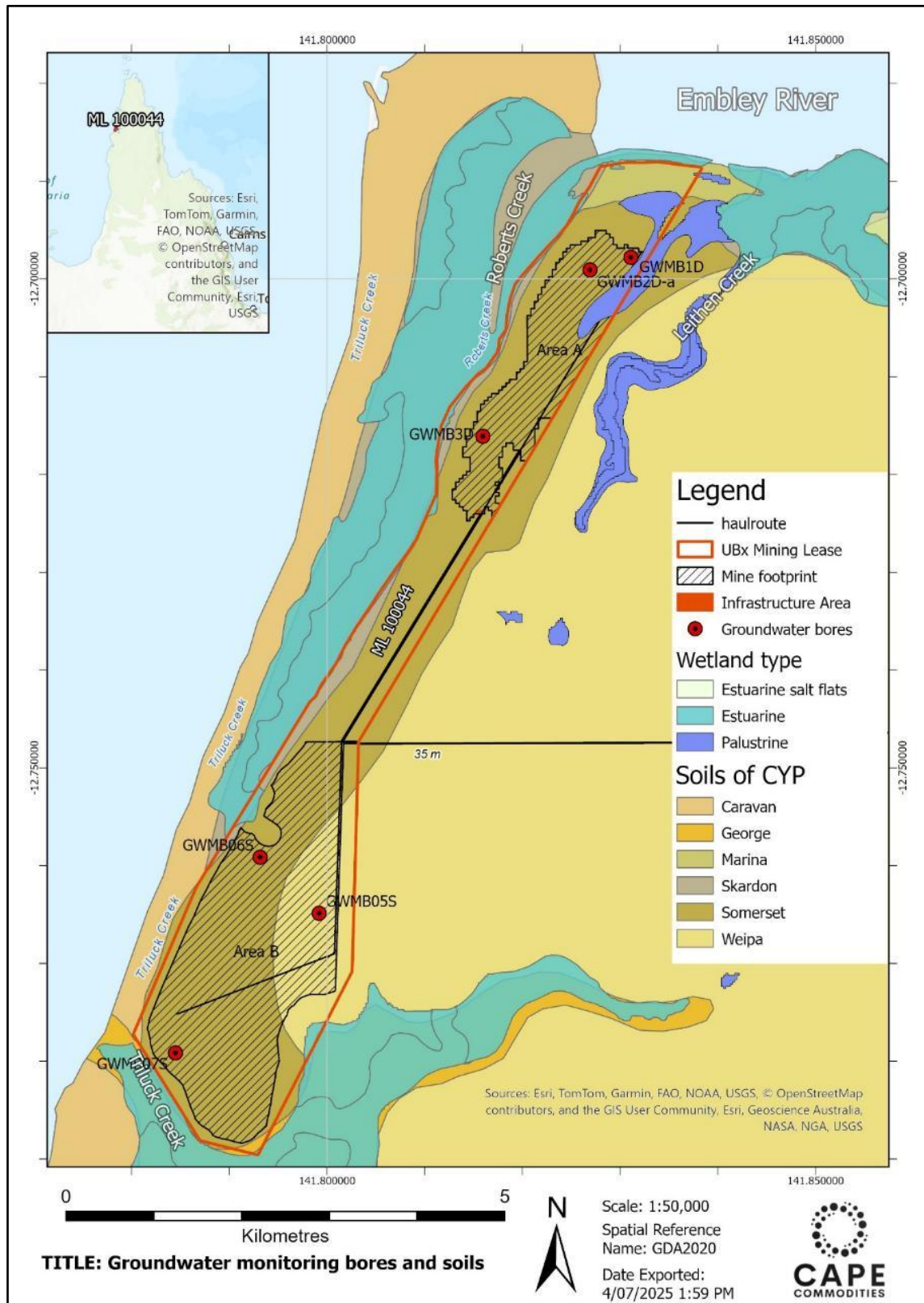


Figure 1-10 Groundwater monitoring bore locations

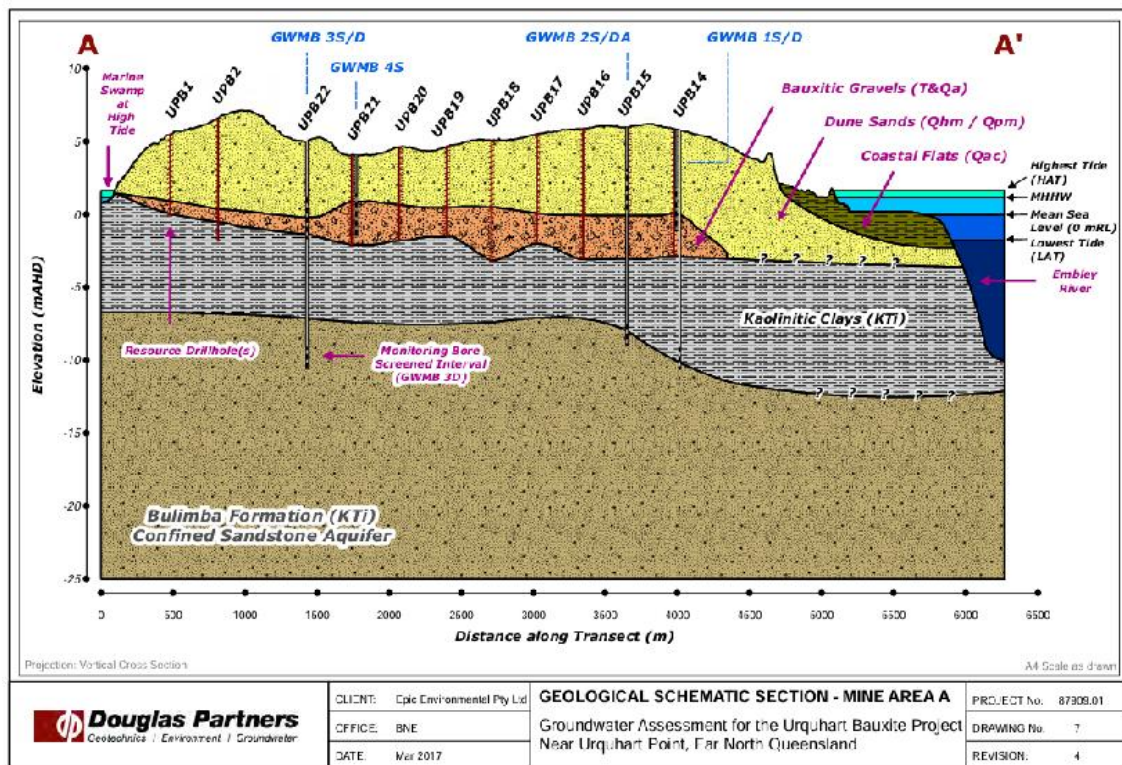


Figure 1-11 Schematic geological diagram at the UBxP

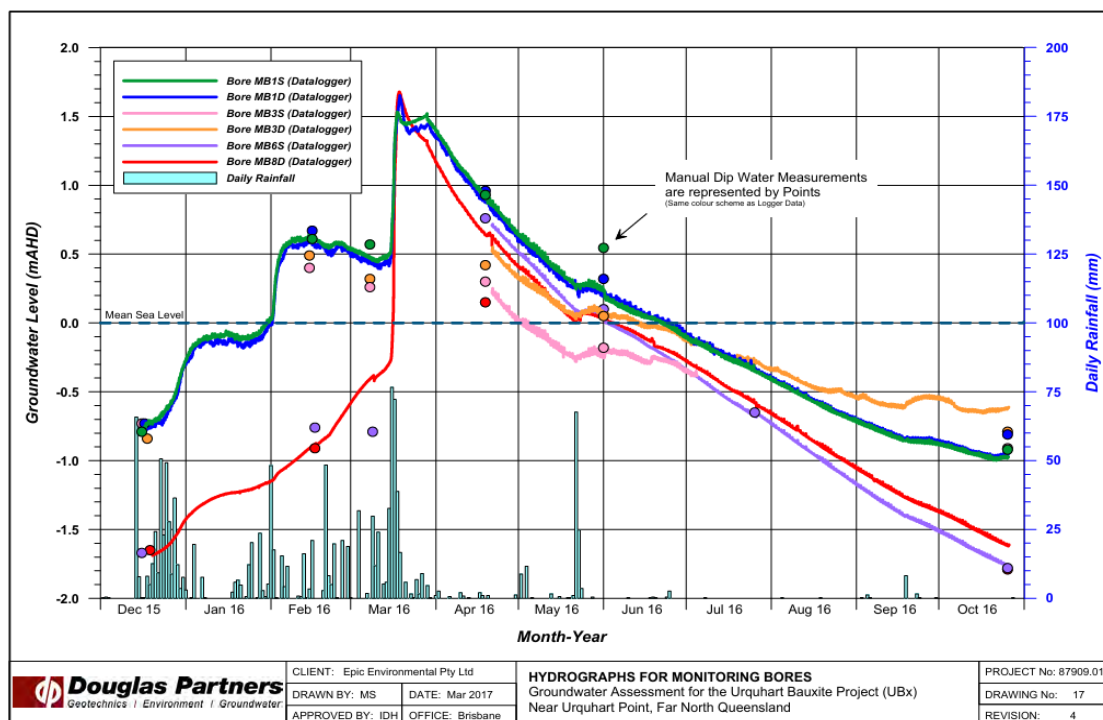


Figure 1-12 Hydrographs recorded at monitoring bores in 2016

Groundwater water quality monitoring conducted in 2016 recorded pH measurements ranging from 4.5 to 7.8 pH units. The pH of groundwater within the shallowest, upper aquifer appears to be slightly acidic, whereas the pH of groundwater in the lower aquifer is much more variable (acidic, neutral or alkaline) and spatially variable.

Most of the bore water columns did not demonstrate significant profile changes, with circumneutral pHs and low EC, reflecting fresh waters. However, for bores near the marshes, significant changes in salinity concentrations with depth were observed. This was interpreted as showing that fresh ground water near the wetlands, marshes, mangroves and flatlands mix constantly with sea water intrusion and/or residual salty waters from tidal flooding of these areas. The substantially different water qualities reflect two distinctive signatures: a shallow freshwater zone underlain by saline water. Water qualities suggest that these zones are separated by a confining layer formed by the kaolinitic white clay originating from decomposed granites. However, this layer does not extend across the entire site and therefore the high permeability of the surficial sands and sea water intrusion will affect the thin upper freshwater layer.

The shallow aquifer generally has higher concentrations of nutrients. This is likely the result of leaching through decaying vegetative matter on the land surface. Groundwater in the shallow aquifer is also higher in concentrations of dissolved metals. The presence of barium, cobalt, copper, manganese, nickel and zinc was detected in shallow aquifer groundwater, albeit in very low concentrations. For the deep aquifer groundwater, only copper was detected in one sample. All other metals of interest recorded concentrations below the limit of reporting.

Recharge to the groundwater system at the UBxP is rapid for the upper unconfined aquifer following significant rainfall events that occur mainly during the wet season. Recharge appears to be very rapid after incident rainfall, particularly for rainfall events in excess of 50 mm/day. Based on recorded groundwater levels in December 2015 and February 2016, it would appear that groundwater levels in the upper aquifer (dune sand, sand and bauxite) subsequently decline towards the end of the dry season, with some areas (particularly in mine area B where the base of the aquifer is relatively high) becoming unsaturated.

The water-table fluctuation (WTF) method provides an estimate of groundwater recharge by analysis of water-level fluctuations in observation wells. The method has been used by hydrogeologists for many years and is based on the assumption that a rise in water-table elevation measured in shallow wells is caused by the addition of recharge across the water table. Recharge in mm/day and as a percentage of rainfall for the three significant groundwater level rises (**Figure 1-12**) were calculated as follows:

- 23/12/15 - 31/1/16: GWMB1S, Recharge = 4 mm/day = 2 % of rainfall for the period
- 31/1/16 - 3/2/16: GWMB1S, Recharge = 13 mm/day = 18 % of rainfall for the period
- 15/3/16 - 17/3/16: GWMB1S, Recharge = 33 mm/day = 18 % of rainfall for the period

Based on this analysis, it can be inferred that the groundwater system receives the bulk of its recharge during the high intensity rainfall events during the wet season. All calculations were based on an assumed aquifer specific yield of 10%.

As part of the original EA application, a four-year mine plan was modelled utilising the MODFLOW drain package to predict groundwater levels during mining operations and time to recovery post-mining (Oresome Bauxite, 2017). The primary objective of the Impact Assessment Model was to quantify the magnitude and extent of drawdown of the upper aquifer at and beyond the surrounds of the bauxite mining areas. A secondary objectives was to quantify potential changes in groundwater discharge to surface water features as a result of induced groundwater drawdown.

Due to the highly seasonal climate at Urquhart Point, and associated cyclic groundwater hydrograph, it was not applicable to calculate groundwater drawdown due to mining, by assessing the change between the start of each mining season, and the end of each mining season. This is because, through the dry period, groundwater hydrographs are receding at a significant rate. If drawdown were calculated across this period without the mining induced stress, the result would be a reasonable drawdown across the entire site, which is highly influenced by the prior season's groundwater mound. For a more accurate reflection of the mining induced drawdown, calculated drawdown has been undertaken from the modelled head without mining (assuming the same future climate scenario) and subtracting the groundwater head distribution at the same period (with active mining) for the end of each mining period. Drawdown was calculated at the end of November, hence represents the worst-case scenario, prior to any recovery during rehabilitation operations.

Modelled draw down was dependent upon the size of the mining area for a season. For Year 1, a groundwater drawdown of approximately one metre is likely to extend a maximum of 280 m (but generally be contained to 150 m) beyond the active mining area, with a maximum predicted groundwater drawdown of 3.5 m compared to non-mining groundwater levels at the same time. Groundwater drawdowns are expected to recover significantly, to within 1 m of the modelled pre-mining level, within one year after mining operations have ceased. The groundwater system is expected to have fully recovered within four years post – mining, to pre-mining groundwater oscillation levels. Modelling suggested that groundwater discharge and interaction with surface water features is unlikely to be impacted during and post-mining operations.

Groundwater modelling indicated that the shallow system underlying the project area is ephemeral in behaviour, with distinctive but seasonal discharges into the wet/marshlands, mangroves and sea. Infiltration following rain events is large and rapid. There is no clear indication that the shallow and deeper groundwater systems are isolated and not in hydraulic continuity.

Groundwater dependent ecosystems

During the preparation of this PRC Plan, a search of the Groundwater Dependent Ecosystem (GDE) Atlas, produced by the Bureau of Meteorology, was conducted to identify any aquatic or terrestrial GDEs within the UBxP footprint. The search confirmed that no aquatic GDEs are mapped in the UBxP area. The wetlands present in the area typically dry out shortly after the wet season, due to high evaporation and infiltration rates at the site, further supporting the absence of aquatic GDEs. However, the GDE Atlas indicates the presence of moderate potential terrestrial GDEs across the entire UBxP footprint.

The model predicts that groundwater drawdown in excess of seasonal fluctuations may reach up to 2.5 metres within the moderate potential GDE footprint, though such impacts are not expected to be significant, given the observed seasonal fluctuations and the groundwater recovery rates. The updated review of the GDE Atlas in 2024 suggests that drawdown within the GDE footprint may generally be less than 1.5 m, which is also not considered to pose a significant impact, as it remains within the extent of seasonal groundwater level variability. **Figure 1-13** presents the GDE mapping within the UBxP region, remaining the same between the original survey in 2013 and the review in 2024.

The majority of the mining areas exhibit moderate potential for groundwater interaction, consistent with findings from the EA groundwater investigations, which noted the shallow depth to water at the site. An elongated strip correlating with LIDAR topographical highs and groundwater mounds—contoured for the end of the wet season—has been identified as having a high potential for groundwater interaction, covering the proposed mining area. This aligns with the conceptual hydrogeological model, which indicates the development of groundwater mounding at the end of the wet season, likely serving as a valuable fresh water source for native vegetation.

Mining operations at the UBxP are not expected to significantly impact any potential Groundwater Dependent Ecosystems (GDEs) for several reasons:

- The groundwater system naturally follows an annual cycle of mounding and depletion, with levels dropping to near the base of the bauxite by the end of the dry season and replenishing during the wet season. This cycle will continue after mining, without long-term disruption;
- Mining will occur during the dry season when groundwater levels are already at their lowest due to natural cycles. Spoil from the mining process will be stockpiled and replaced after extraction, with the replaced material having an aquifer-specific yield equal to or greater than before mining;
- After mining, the unconfined aquifer will continue to function naturally, without any ongoing disruption to groundwater levels;
- Groundwater mounding will persist during the wet season post-mining, as predicted by the rapid recovery of groundwater drawdowns following backfilling; and
- The natural wetting and drying cycles of the aquifer system have not shown significant impacts on GDEs at the site. Aerial imagery indicates that native vegetation thrives during both the wet season's heavy rainfall and the extended dry season, suggesting the aquifer's fluctuations do not adversely affect local ecosystems.

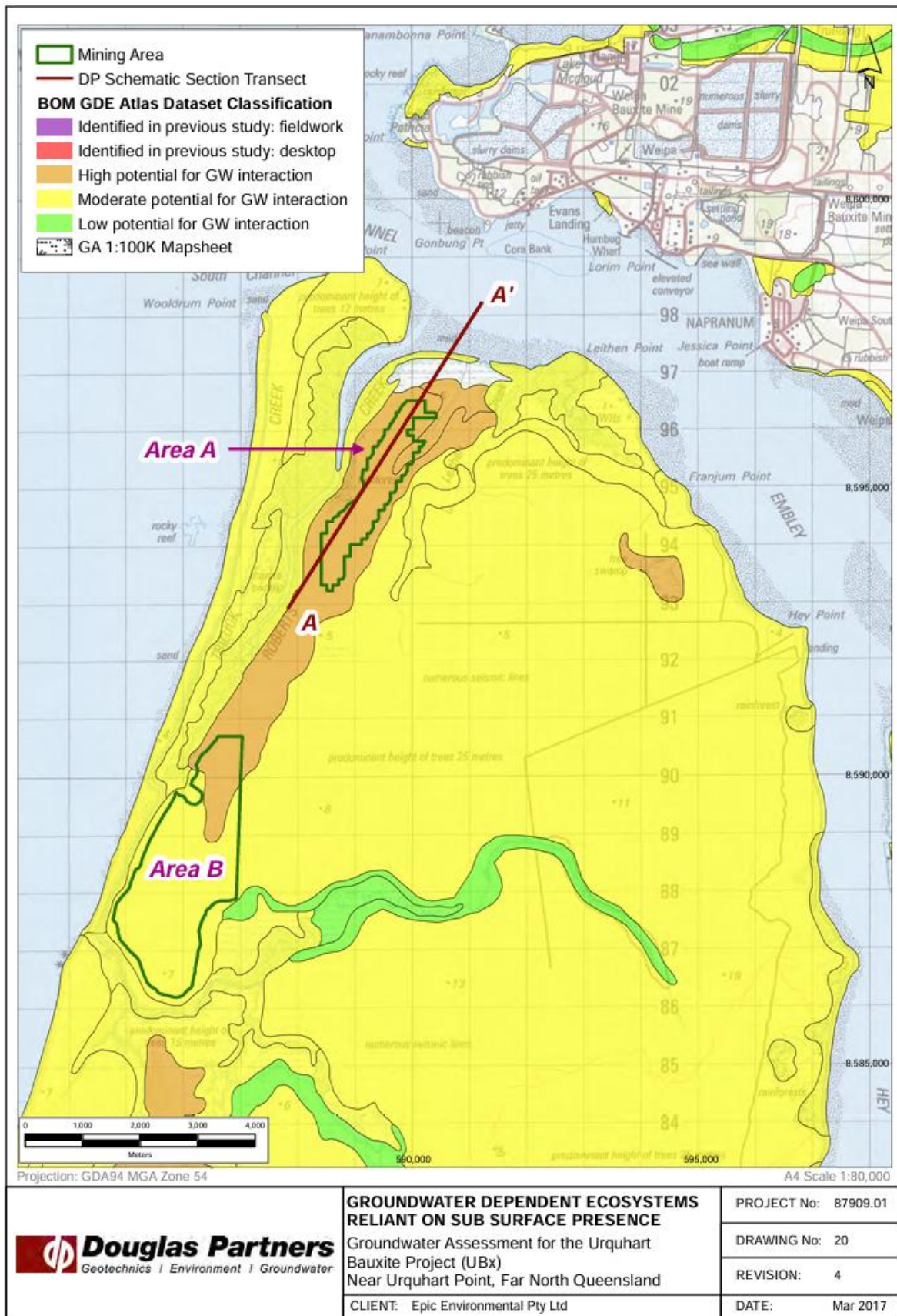


Figure 1-13 Presence of Groundwater Dependent Ecosystems

1.2.8 Soil

Soils at the UBxP site were predominantly mapped as deep to very deep, uniform sands (Tenosols) formed in beach ridges on cheniers and beach ridge plains, as part of the Cape York Peninsula land suitability survey completed in 1994 (Biggs & Phillips, 1995). The dominant soil type on the UBxP, and the main one to be disturbed by mining, is Somerset (SS), described as very deep, uniform coastal sand deposited on laterite and other surfaces (**Figure 1-7**). Weipa (Wp) Kandosols occur within the eastern half of Area B, described as deep gradational or uniform red massive soil with aluminous concretions. Other soil types, including marine hydrosols and verosols, are located on the periphery of the lease and are outside the disturbance footprint.

Exploration drilling across the site has revealed a variable soil profile. In Area A, the average thickness of the target orebody is 1.8 metres, with an overburden of 5.2 metres. This overburden consists of 0.5 metres of transitional bauxite material and 4.7 metres of sand, with occasional patches of transported bauxite. Beneath the orebody, samples indicate the presence of ironstone or kaolinite-dominated underburden. In contrast, Area B has a thinner target orebody, averaging 0.7 metres in thickness and present in only half of the drilled area. Although the overburden is thinner in this area, it still represents a significant upper transition zone (IMC, 2018).

1.2.9 Land Stability

The low topographic relief and the coarse, sandy nature of the soils presents a low erosion risk. There has been no evidence detected on site of erosion and is unlikely due to the high permeability of the sands present on site. However, it was noted within the technical assessments for the EA application that the high rainfall of the area increases the erosion potential, especially just after the topsoil has been reinstated. There is also potential for wind erosion during this period.

To reduce the impact of high rainfall and potential for wind erosion, the intent to return the cleared vegetation as a layer over the re-spread topsoil (at the time of topsoil respread) will act as both a source of vegetative material/seeds for re-growth and a protective layer over the topsoil to reduce erosion potential and moisture loss. Utilising a mulch layer as a surface stabilisation technique has been utilised by other projects in Australia to enhance rehabilitation stabilisation success (Brooks, 2000; Finucane, Hardmand, & Harley, 2006). Vegetation, litter and coarse debris regulate runoff on slopes, with the presence of surface materials contributing to the stability of slopes and reducing erosional potential (Tongway & Ludwig, 2011).

Another element able to assist in stabilising soil is naturally occurring biological soil crusts (an association between soil particles and cyanobacteria, algae, microfungi, lichens and bryophytes in varying proportions) (Belnap, Buedel, & Lange, 2001), provided that traffic and animals do not cause significant disruption (Finucane, Hardmand, & Harley, 2006). Biological crusts (the microbiota) are stimulated by the addition of water, utilising small rainfall events or dew. They have relatively low moisture requirements so are able to continue to colonise areas of sparse vegetation, when moisture content is unable to support vascular plant growth (Belnap, Buedel, & Lange, 2001), stabilising soils in the absence of vascular plant roots (Eldridge & Greene, 1994). Biological crusts form within an initial six months following disturbance, in the absence of further disturbance (Finucane, Hardmand, & Harley, 2006).

No significant soil stability issues are expected to limit rehabilitation efforts at UBxP, particularly as the site is of low relief. Other mining operations within low-relief, sand dominated areas have excavated and rebuilt large dunes, such as on North Stradbroke Island (rebuilding dunes over 100 m above sea level) and Fraser Island (mining dunes between 20 m and 150 m above sea level), requiring artificial stabilisation (such as a dilute bitumen compound) to ensure the steep slopes remained stable until vegetation was able to establish (Smith & Nichols, 2011). Reduction in slopes from 32° on the tallest dunes to 25° or less was necessary to implement topsoil respread and rehabilitation on the slopes (Brooks, 2000). Techniques to stabilise the surface on low lying dunes are not so essential as the dunes are not subject to the strong winds as the high dunes (Brooks, 2000). Brush-matting or mulching may be necessary to protect the topsoil, and act as a source of propagules (Brooks, 2000). Other mineral sand projects on low relief sites have observed stable soils, particularly where brush-matting or mulching has been employed (Finucane, Hardmand, & Harley, 2006). Weak soil crusts were also observed to provide soil stability at many of the case study sites in Finucane, Hardmand, & Harley (2006).

1.2.10 Vegetation

Vegetation across the site is predominantly classed within Category B, remnant vegetation areas under the *Vegetation Management Act 1999* (VM Act). Essential habitat for threatened species occurs within the northern and southern areas of the ML and a high-risk area on the Protected Plants Flora Trigger Map encompass the majority of intended clearing Area B, but does not overlap Area A (Department of Resources, 2024). This trigger area is considered to be associated with the Cooktown Orchid (*Dendrobium bigibbum*), and the Chocolate Tea Tree Orchid (*Dendrobium johannis*), which are the only threatened species identified at the UBxP to date. These species are confined to vine, mangrove and swamp forests, 99.5% of which remain outside of the mine footprint.

Ten Regional Ecosystems (RE's) are identified within the UBxP area utilising the current state certified mapping (Version 13.1 – Biodiversity status of 2021 remnant ecosystems). Vegetation surveys undertaken in 2015 (**Appendix D**) verified that the certified mapping accurately represented the dominant ecosystems but several small RE's were also present. A total of 16 RE's have been mapped within the mining lease boundary based on the field surveys, including the presence of some small grassland, wetland and vine thicket communities.

RE 3.2.10a (*Eucalyptus tetradonta* and *Corymbia clarksoniana* woodland on stabilised dunes) dominates the northern half of the ML (Area A) and RE 3.5.36b (*Eucalyptus tetradonta* and *Corymbia nesophila* woodland to open forest on undulating plains and remnant plateaus) dominating the southern half (Area B).

The vegetation surveys undertaken in 2015 for the UBxP followed the methods outlined by Neldner et al. (2012) for both quaternary and secondary site assessments. Quaternary surveys were rapid on-ground visual assessments aimed at verifying vegetation types and confirming the location of vegetation map unit boundaries across the project area. These surveys maximised site coverage, assessed the accuracy of RE designations, and determined the extent of each vegetation unit. Fieldwork involved traversing the site by vehicle and foot, with surveys conducted at 30 quaternary-level sites to ensure accurate RE boundaries and effective aerial imagery interpretation.

Secondary surveys were conducted at 30 randomly selected sites within representative vegetation communities across the project area. Fieldwork in April 2015 focused on regional ecosystems with understoreys that are susceptible to die-off or burning during the dry season, such as eucalypt forests, grasslands, and wetlands, which represent the majority of the vegetation communities in the project area. Vine thickets and mangroves, which experience less seasonal variation, were surveyed in November 2015. The timing of these surveys followed Neldner et al.'s (2012) recommendations to assess understorey diversity at the most appropriate times of year. The locations of these surveys and the relevant REs for the UBxP are shown in **Figure 1-14**.

Survey data were used to describe the flora species and vegetation units present in the area. Targeted surveys for threatened flora were also conducted in habitats likely to support species of conservation significance, based on a desktop review of online databases and surveys from nearby mining leases.

A total of 317 vascular plant species were recorded during both wet and dry season surveys. Among the recorded species, the Cooktown Orchid (*Dendrobium bigibbum*) and the Chocolate Tea-tree Orchid (*Dendrobium johannis* – unconfirmed identification) were the only threatened species encountered. Both species, listed as vulnerable under the *Nature Conservation Act 1992* (NCA) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC), were found in vine, mangrove, and swamp forests, which are not located within the proposed clearing area. Few species of conservation significance are known to exclusively utilise *Eucalyptus tetradonta* woodlands as habitat, and no species identified from the site are restricted to this habitat. Habitats for significant species were primarily located along the coastline and in nearby vine forests and wetlands.

An overview of the field verified REs, their conservation status under the VM Act and EP Act, the total area and area to be cleared is provided in **Table 1-5**.

Table 1-5 Field verified regional ecosystems within the UBxP disturbance area

Field verified RE	Short Description	Total area on project site (ha)	Area within clearing footprint Area A (ha)	Disturbance (Area A) as a % total area on site	Area within clearing footprint Area B (ha)	Disturbance (Area B) as a % total area on site	RE area within total clearing footprint	Total Disturbance as a % of total area on site
3.1.1a	<i>Rhizophora stylosa</i> and/or <i>Bruguiera</i> spp. closed forest	2.22	0.00	0.00	0.00	0.00	0.00	0
3.1.3	<i>Ceriops tagal</i> and/or <i>C. australis</i> +/- <i>Avicennia marina</i> low open forest	19.34	0.00	0.00	0.00	0.00	0.00	0
3.1.5	<i>Sporobolus virginicus</i> closed tussock grassland on coastal plains	6.53	0.00	0.00	0.00	0.00	0.00	0
3.2.10	<i>Eucalyptus tetrodonta</i> and <i>Corymbia clarksoniana</i> +/- <i>E. brassiana</i> or <i>Erythrophleum chlorostachys</i> woodland on stabilised dunes	628.29	220.68	35.12	91.04	14.49	320.98	51.09
3.2.2	Semi-deciduous vine thicket to vine forest on beach dunes and ridges	38.47	0.00	0.00	0.00	0.00	0.00	0
3.2.24	Mixed open tussock grassland and open forblands or shrublands on exposed foredunes and islands	0.26	0.00	0.00	0.00	0.00	0.00	0
3.2.4	<i>Melaleuca</i> spp. open forest in dune swales and swampy areas	28.79	0.00	0.00	0.00	0.00	0.00	0
3.2.5a	<i>Acacia crassicaarpa</i> on coastal dunes and beach ridges, woodland to open forest	0.47	0.00	0.00	0.00	0.00	0.00	0
3.3.20	<i>Corymbia clarksoniana</i> or <i>C. novoguineensis</i> woodland on alluvial plains	90.00	6.30	7.00	40.00	44.44	46.30	51.44
3.3.49	<i>Melaleuca viridiflora</i> low open woodland	19.25	0.00	0.00	0.00	0.00	0.00	0
3.3.50	<i>Melaleuca</i> spp. woodland on swamps on floodplains and non-floodplain landforms	4.90	0.00	0.00	0.00	0.00	0.00	0
3.3.60b	<i>Themeda arguens</i> closed tussock grassland on coastal plains	8.22	0.00	0.00	0.00	0.00	0.00	0
3.3.63	<i>Eleocharis</i> spp. open sedgeland swamps	5.21	0.00	0.00	0.00	0.00	0.00	0
3.3.9	<i>Lophostemon suaveolens</i> woodlands on creeklines and swamps	21.94	0.00	0.00	0.00	0.00	0.00	0
3.5.36b	<i>Eucalyptus tetrodonta</i> and <i>Corymbia nesophila</i> woodland to open forest on undulating plains and remnant plateaus	475.42	0.00	0.00	405.98	85.39	405.98	85.39
3.5.4	Semi-deciduous notophyll vine forest in small patches on northern plateaus	3.33*	0.00	0.00	0	0.00	0.00	0

*RE 3.5.4 occurs within Area B clearing footprint but will be buffered from clearing.

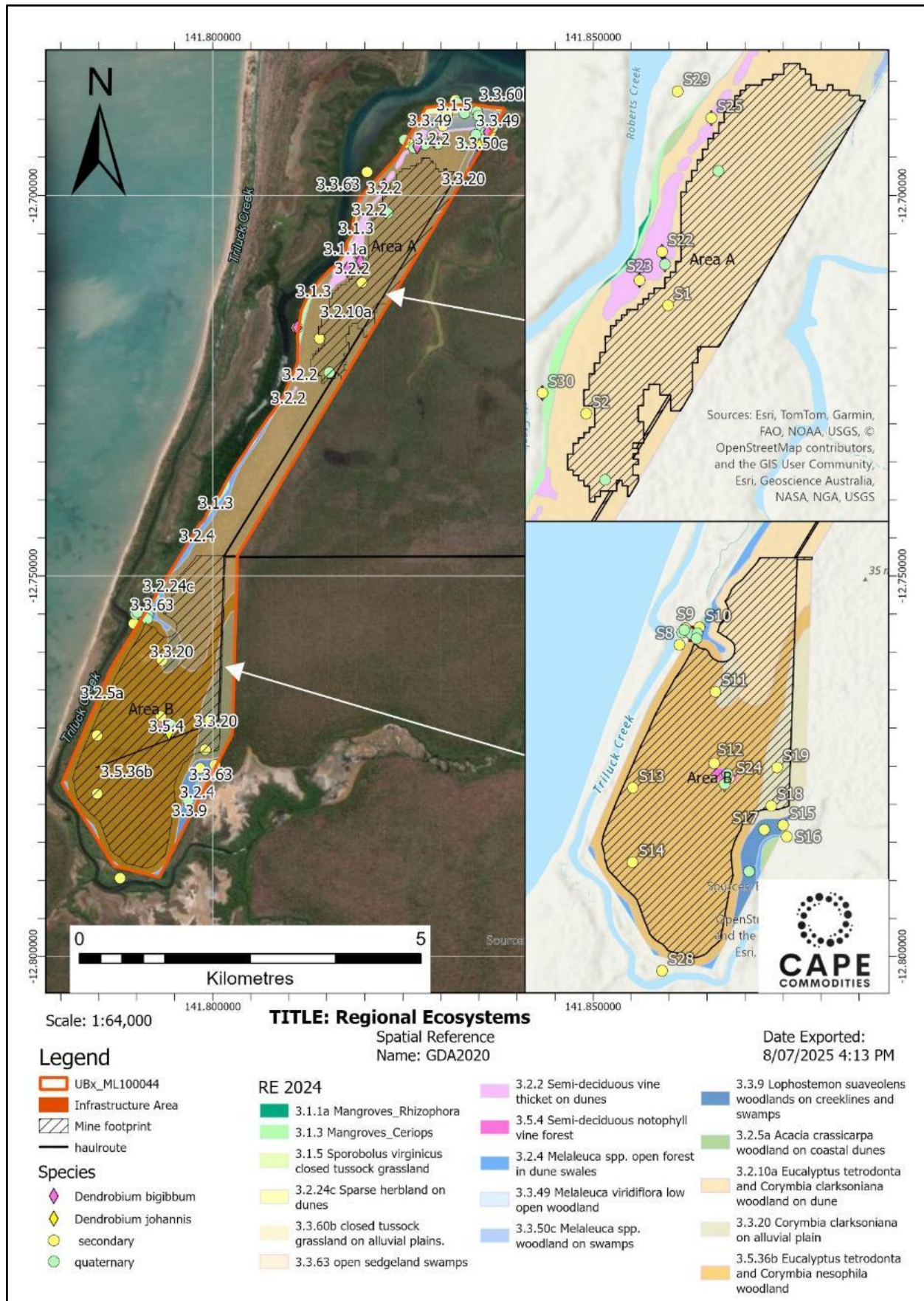


Figure 1-14 Field-verified RE mapping and threatened flora locations

1.2.11 Threatened species

Terrestrial fauna surveys were undertaken in 2015 over two discrete periods in order to allow for temporal variations in fauna assemblages and presence of migratory species: April 2015 (late in the wet season) and November 2015 (late in the dry season). Survey methods included the use of Elliot, funnel, pitfall and hair tube traps, bird surveys, nocturnal searches, diurnal searches, ultrasonic bat recorders and song meters for amphibian activity. Hollow bearing trees were also targeted during daytime searches and locations recorded.

A total of nine amphibians, 22 reptile species, 111 species of birds and 21 species of mammal were detected during the surveys. This diversity is typical for the Weipa region and represents 61% of the faunal diversity recorded in the adjacent South of Embley Project area, despite being only 1.6% of the total area. This reflects the homogeneity of the habitats at a regional scale, rather than a particular value attributable to the UBx area, specifically (**Appendix D**).

12 fauna species, and two flora species of national and/or state level conservation significance were recorded within the UBxP area during the 2015 survey periods. These species and their status under the EPBC Act and/or NC Act are provided in **Table 1-6**.

Excluding the species listed as Migratory or Marine, two threatened fauna species were detected on site, namely the Palm Cockatoo (*Probosciger aterrimus macgillivrayi*) (vulnerable under the EPBC Act and Endangered under the NC Act) and Near Threatened (NC Act) Rufous Owl (*Ninox rufa meesi*). Palm Cockatoos were sporadically recorded across the UBxP area. The majority of sightings occurred in the mosaic of paperbark swamp, coastal dune forests, mangroves and vine thicket that occurs along the estuary coastlines of the project area. Palm Cockatoos were also observed flying overhead through open eucalypt forests and likely utilise these habitats seasonally. A single Rufous Owl was observed roosting in a small (<3 ha) patch of *notophyll* vine forest (RE 3.5.4) in Area B of the survey area. This forest was tall, dense and more developed than any of the vine forests located on the sand dunes elsewhere within the UBxP area.

Few species of conservation significance are known to utilise *Eucalyptus tetradonta* woodlands exclusively as habitat, and no species identified from the site are restricted to this habitat. Habitats for significant species were primarily located along the coastline and in nearby vine forest and wetlands. Survey records are shown in **Figure 1-15**.

Additional targeted fauna surveys were undertaken in 2016 to provide the Commonwealth with an accurate assessment of potential impacts to Bare-rumped Sheath-tail Bat and Palm Cockatoo. These additional field surveys were conducted between 24-29 July 2016 and 13-16 December 2016 to assess the potential for breeding sites for Palm Cockatoo to occur within the proposed mining areas and to assess the potential for the presence of Bare-rumped Sheath-tail Bat. Neither species were observed during these surveys (Epic, 2016).

During the July 2016 survey, the Common Sandpiper (*Actitis hypoleucos*) was recorded at Hey Point and had not previously been documented with regards to the Project.

Table 1-6 Conservation Significant Species, Status and Occurrence in the Project Area

Common Name	Scientific Name	Status - EPBC Act	Status – NC Act	Occurrence in the Project Area
Fauna				
Great Frigatebird	<i>Fregata minor</i>	M	LC	Survey record(s) from the mouth of Roberts Creek (Appendix D). Locally common over marine waters and along coastlines.
Lesser Frigatebird	<i>Fregata ariel</i>	M	LC	Survey record(s) from the mouth of Roberts Creek (Appendix D). Locally common over marine waters and along coastlines.
Brown Booby	<i>Sula leucogaster</i>	M	LC	Survey record(s) from the mouth of Roberts Creek. Reasonably common over marine waters and along coastlines.
Eastern Osprey	<i>Pandion cristatus</i>	Marine	LC	Nest site in Area B (in the south) and records from two other locations onsite (METServe, 2016). Recorded from Hey Point in July 2016. Widespread locally.
Whimbrel	<i>Numenius phaeopus</i>	M	LC	Survey record from the mouth of Roberts Creek (Appendix D).
Common Greenshank	<i>Tringa nebularia</i>	M	LC	Survey record from the mouth of Roberts Creek (Appendix D).
Common Sandpiper	<i>Actitis hypoleucos</i>	M	LC	Recorded in small numbers at Hey Point in July 2016.
Common Tern	<i>Sterna hirundo</i>	M	LC	Survey record from the mouth of Roberts Creek (Appendix D).
Rufous Owl	<i>Ninox rufa meesi</i>	-	NT	One survey record onsite (Appendix D).
Palm Cockatoo	<i>Probosciger aterrimus macgillivrayi</i>	V	E	Survey records at six locations onsite, four in Area B (in the south) and two in Area A (in the north) (Appendix D). One July 2016 survey record south of Hey Point.
Flora				
Cooktown Orchid	<i>Dendrobium bigibbum</i>	V	V	Survey records in vine thickets to the north and west of Mine Area A (Appendix D).
Chocolate Tree Orchid	<i>Dendrobium johannis</i>	V	V	Survey records of one individual in small patch of notophyll vine thicket in Mine Area B (was not flowering so identification was not confirmed) (Appendix D).

Notes: M = Migratory; NT = Near Threatened; LC = Least Concern; V = Vulnerable



Figure 1-15 Threatened species detected during surveys within the UBxP ML

1.2.12 Pre-Mining Land Use

The Embley catchment area, in which the UBxP is located, contains a variety of land uses including managed resource protection, grazing and residential areas. Rio Tinto's East Weipa, Andoom and Amrun bauxite mines are the dominant land use within the lower catchment, with grazing within native vegetation occurring in the upper reaches of the catchment. The catchment is sparsely populated outside the townships of Weipa and Napranum (**Figure 1-16**).

Within the Project area and immediate surrounds, there are no conservation reserves, stock routes, easements, or public road reserves. The tenure does not include any properties, and there is no formal vehicular access to the site. Several small tracks, likely created by all-terrain vehicles (ATVs) used by recreational hunters, are present on-site.

The closest residential sensitive receptors are located across the Embley River at Nanum (~6.5 km) and Napranum (~6 km). The Evan's Landing Industrial area of Weipa is located ~ 3 km across the Embley River. The Wik Timber lease at Hey Point is the proposed shipping load out area for the project, located approximately 8 km from the project lease. Natural sensitive receptors in the area are the receiving waters surrounding the site, including the mouth of the Embley River and the broader Albatross Bay.

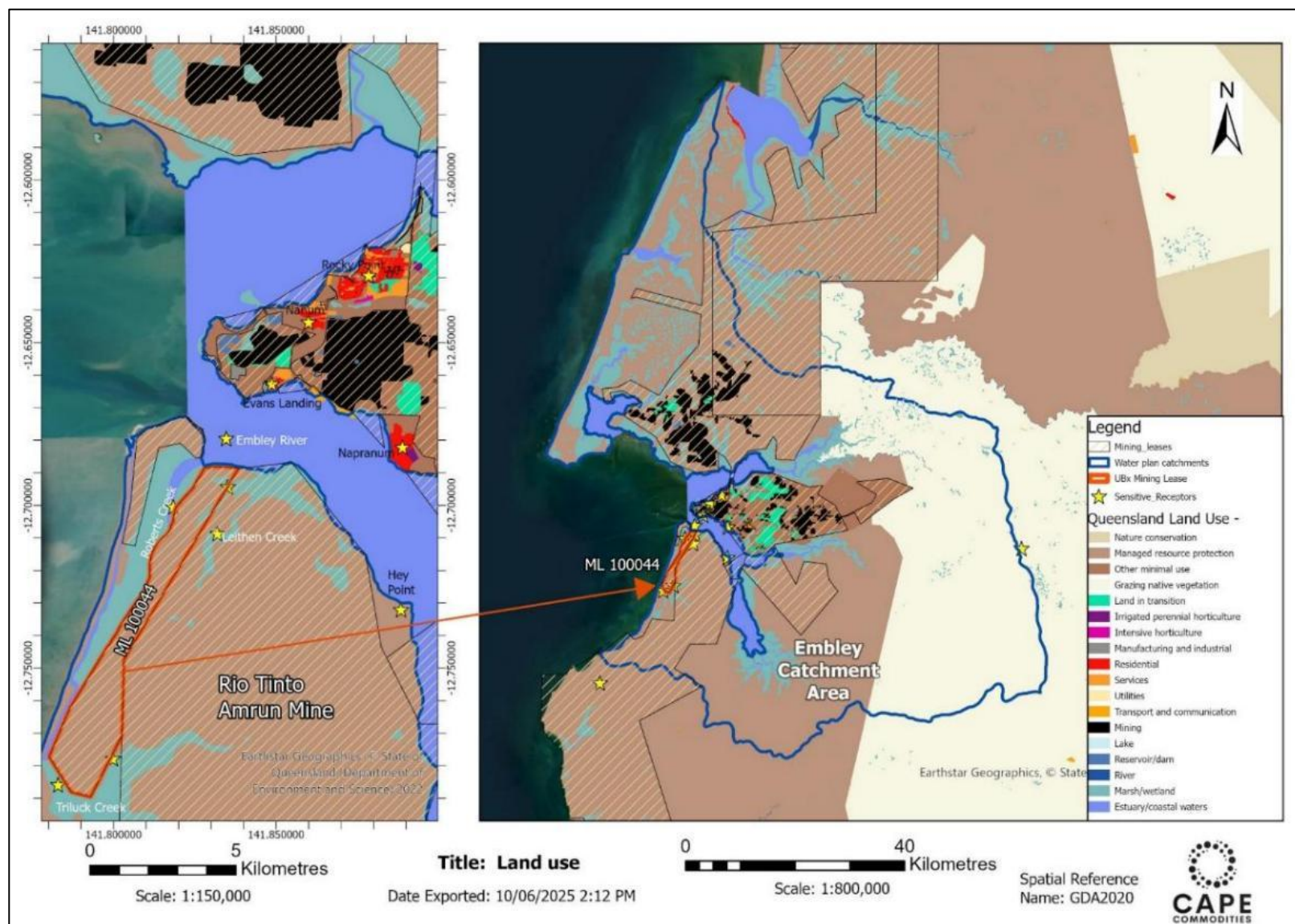


Figure 1-16 Land use within the vicinity of the site and the wider Embley Catchment Area

1.3 Relevant Activities

1.3.1 Environmentally Relevant Activities

A site-specific Environmental Authority (EA) (**Appendix A**) is held for the UBxP for the Environmentally Relevant Activity (ERA) Schedule 2A 11: Mining Bauxite in ML100044.

1.4 Project Description

Cape Commodities acquired 100% ownership of the project in October 2025 from the joint venture between Oresome Bauxite and Ozore Resources Pty Ltd. Cape Commodities is a registered suitable operator (suitable operator reference number RSO650035).

The UBxP involves two bauxite deposits, Area A and Area B, located on ML 100044. Mining will occur sequentially in Area A and Area B during the dry season (April to December), utilising traditional shallow pit / panel bauxite mining methods in conjunction with truck and shovel techniques. Mining in Area A will begin first, with a maximum production rate of less than 1.0 million tonnes (Mt) of bauxite per year over a 5-6-year period. The inferred resource in Area A is approximately 7 Mt, which limits the production rate and total available resource. After Area A is mined, operations will transition to Area B, which has a smaller resource and a mine life of approximately 1-2 years.

The bauxite to be extracted at the UBxP is primarily Direct Shipping Bauxite (DSB), meaning no beneficiation will be required, aside from minor screening activities onsite to remove debris. This eliminates the need for bauxite washing, sediment detention ponds, and the associated risk of releasing turbid water into nearby creeks. The first and last (top and bottom) scraper loads of the target bauxite will be screened to remove <2 mm and >20 mm material for return to the mined pit, consisting of vegetation, oversize ironstone and fines. For the first and last loads, up to 30% of the mined material may be returned to the pit. One hundred percent of the remainder of the bauxite loads will shipped, resulting in less than 10% overall reject inert material being returned to the pit.

Mined and screened bauxite will be hauled approximately 9 km by truck across ML 7024 to the Wik Timber lease at Hey Point for stockpiling and shipping. The Hey Point area is freehold land, held by Ngan Aak-Kunch Aboriginal Corporation (NAK), and leased as a 100-year lease to WIK Timbers. A sublease from Wik Timbers (sublessor) to Cape Commodities (sublessee) was signed 2 February 2026 providing access to approximately 5.4 ha of their lease to Cape Commodities for the purpose of bauxite stockpiling and shipping load out. Approval of the sublease is currently before directors of NAK to finalise access across Hey Point. The indicative project layout of the UBxP, including the haul road across to Hey Point, is shown in **Figure 1-17**. Access to the UBxP site during construction will be via the water, landing at Hey Point and traversing across the haul road constructed across ML 7024 to the site. Up to 18 construction and operational staff will potentially be accommodated within the Wik Timbers workers camp located at Hey Point (to be negotiated). The remainder of staff will commute daily from Weipa within Cape Commodities commuter vessels. No on-site accommodation will be needed during construction or operations within the mining lease area.

The mining infrastructure area will house the following:

- A workshop area (two 40' shipping containers with an igloo in between). Hazardous material will be stored within the shipping containers in the work shop area.
- Bunded fuel pod.
- Portable 40' crib room.
- 20' administration building.
- A bank of Portaloo's.
- A small rainwater watertank.
- Go-line for park up of machinery
- Separate LV and HV tracks within the MIA.

Refuelling of mine vehicles will most likely be undertaken from a service vehicle, with the main fuel storage occurring at Hey Point. Overland delivery of fuel through the RTAW lease, as opposed to sea delivery to Hey Point, will allow fuel to be stored on site for refuelling and has been allowed for within the infrastructure area and planning.

The duration of UBxP operations will be approximately 7 years. Mining will be restricted to the dry season, from April to December, depending on the timing of the wet season. Mining operations at the UBxP will be undertaken in panels of 1 ha, with an area of 2 ha being disturbed at any one time. No infrastructure is to be retained on site at the conclusion of the project.

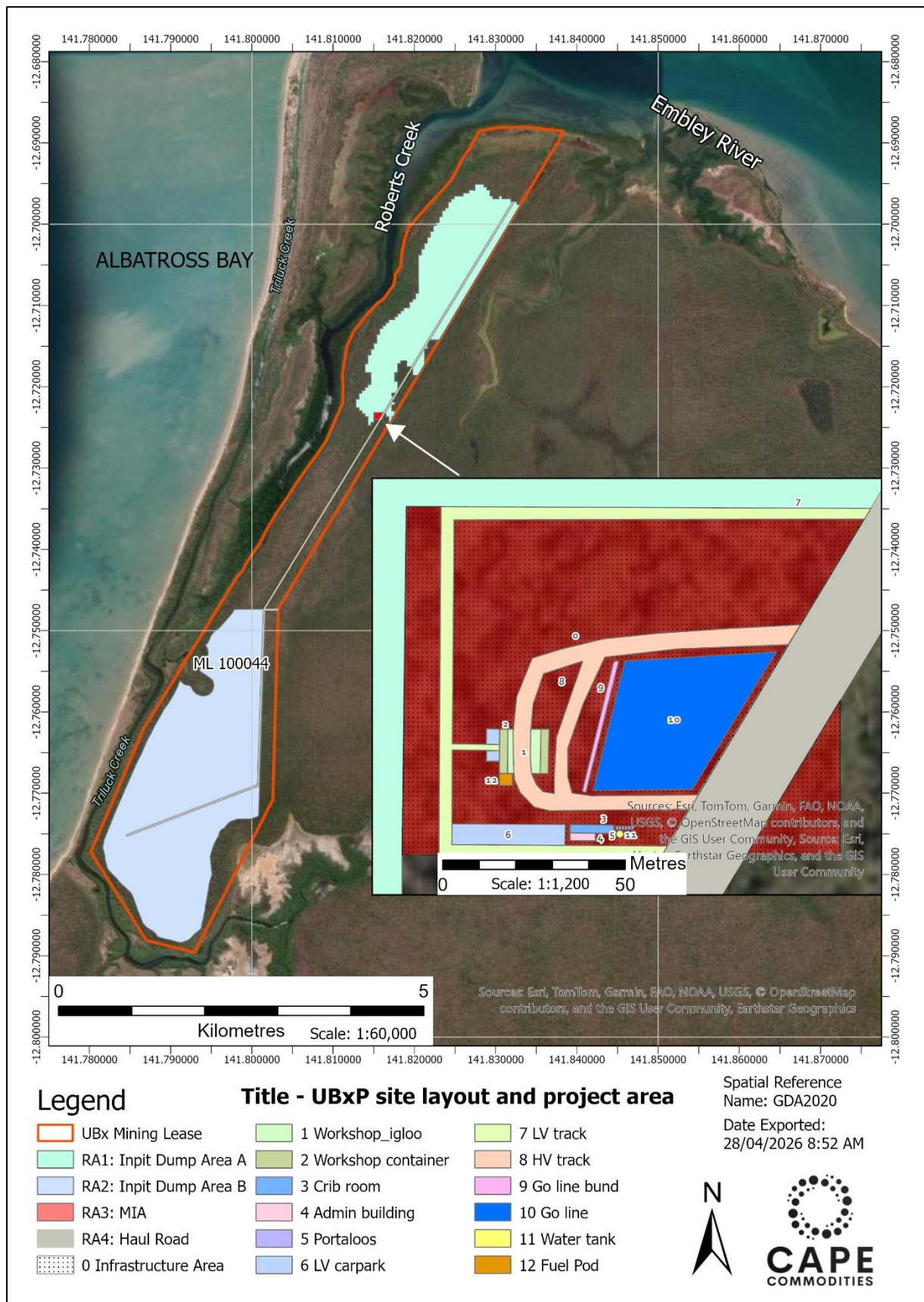


Figure 1-17 UBxP Site Layout and project area

1.4.1 Project Schedule

Operational duration each year will be determined by the duration and magnitude of the wet season, with clearing and extraction expected to occur between April and December only. The clearing footprint has been designed to exclude the semi-deciduous vine thickets (RE3.2.2) due to the presence of the threatened orchid *Dendrobium bigibbum*, the Of Concern *Melaleuca* swamps (RE 3.2.4) and the Of Concern plateau vine thicket (3.5.4) with at least a 50 m buffer.

In Year 1 of the UBxP, approximately 15 ha will be mined, and 12 ha cleared for the development of an internal haul road. The Mine Infrastructure Area which will be installed at the south of Area A and be retained for the entire duration of the UBxP. Rehabilitation trials will begin in the first cleared panel (~1 ha). By the end of Year 1, a total of 15 ha will be rehabilitated.

Year 2 will focus on clearing and mining ~23 ha and rehabilitating the entire area (23 ha).

Years 3 to 6 will depend on the progress of the first two years. If mining continues, the remainder of Area A (~189 ha) will be mined and rehabilitated. Alternatively, if the project enters closure, Year 3 will involve the rehabilitation of the infrastructure area (1 ha) and reduction of the haul road to a narrower track (approximately 5 m wide) for monitoring access.

From Year 6 to Year 7, the extension of the haul road into Area B (~8 ha) and the mining and rehabilitation of Area B (~540 ha) will occur. Rehabilitation monitoring of Area A will continue, with infill planting of tube stock grown from locally sourced seed. Light vehicular access using an ATV will be allowed in the northern section of Area A. At the end of Year 7, infrastructure will be demobilised, and haul roads will be reduced to access tracks for ongoing rehabilitation monitoring. **Figure 1-18** illustrates the staged progression of disturbance at the UBxP.

The main stages of the mining activity are outlined below and presented in **Figure 1-19**:

- **Site establishment:** Vegetation will be cleared, mulched and stockpiled. Larger trees with hollows will be felled and placed in the rehabilitation area to provide fauna habitat.
- **Early works and construction:** A two-stage stripping process will be implemented. Topsoil (top 10 cm) will be stripped, followed by the subsoil, leaving exposed bauxite to be mined. The topsoil and subsoil will be placed into the previously mined panel, commencing the progressive rehabilitation process.
- **Operations:** Exposed bauxite will be removed with 623 Scrapers then windrowed with a 352 excavator. The windrowed bauxite will be loaded into road trains and transported across the Rio Tinto ML7034 lease to the product stockpile area at Hey Point, where it will be exported. Minor screening may be required prior to transporting the bauxite to the stockpile at Hey Point.
- **Decommissioning/Rehabilitation:** The remaining mined areas will be rehabilitated with progress monitored during rehabilitation monitoring (**Section 9.1.2**) and success measured against **Table 9-5**.

The panel mining activity has been designed to minimise movement and handling of topsoil and subsoil (overburden) while maximising the efficiency of the whole of life mining process by directly placing overburden and topsoil. Screening waste will be placed back into the mine pit to allow progressive rehabilitation. The aim of the mining process is to ensure that rehabilitation closely follows the progression of the open mining pit, with only two hectares actively disturbed by mining (excluding rehabilitation activities) during a given mining season.

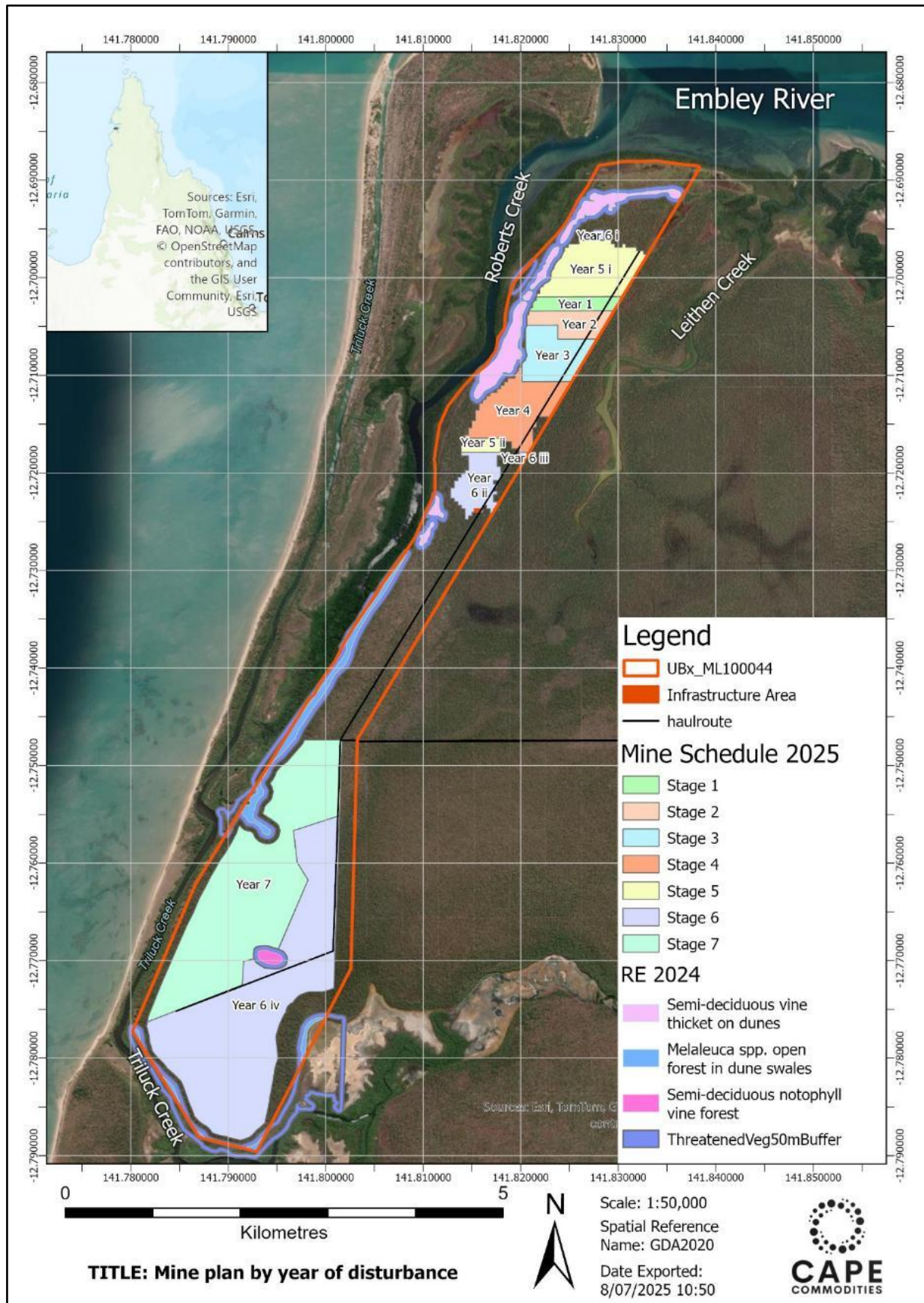


Figure 1-18 UBxP indicative staged disturbance schedule

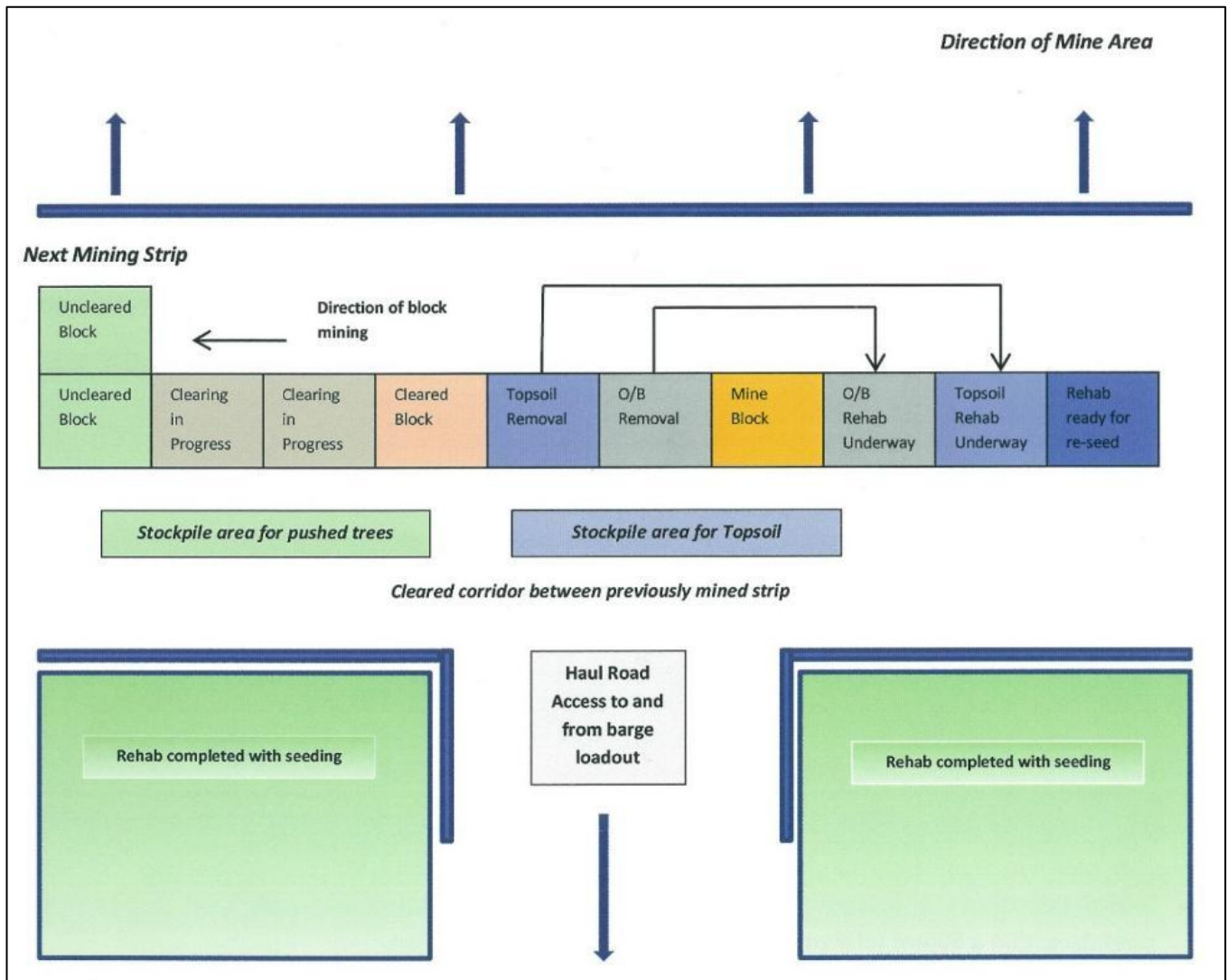


Figure 1-19 Proposed mining and progressive rehabilitation process.

2 Legislative Requirements

2.1 Mineral Resources Act 1989

Resource activities are regulated through a 'resource authority' under the *Mineral Resources Act 1989* (MR Act). This provides resource companies with the right to enter land and undertake the approved activity. Under section 107(10) of this act, a mining claim can only be surrendered once improvement restoration (i.e., returning the tenement to substantially the same condition it was in before mining) has been carried out and the relevant environmental authority has been surrendered.

2.2 Environmental Protection Act 1994

The *Environmental Protection Act 1994* (EP Act) is the principal legislation for protecting environmental values potentially affected by the resource industry in Queensland. The EP Act grants the Queensland Government the power and means to assess, approve and prescribe conditions on proposed mining projects.

The EP Act requires that all areas of disturbed or undisturbed land within the relevant mining tenure be rehabilitated to a post-mining land use (PMLU) or managed as a non-use management area (NUMA). Section 125(1)(n) of the EP Act requires a proposed PRC plan to accompany site-specific EA applications for a mining activity. In the case of mining operations which hold an existing site-specific EA prior to the PRC Plan framework being implemented, transitional provisions apply. These provisions include issuing existing holders of site-specific EAs with a transition notice. The transition notice will require the EA holder to develop and submit a proposed PRC Plan which complies with sections 126C and 126D of the EP Act by a specific date. Transitional PRC Plan's should translate all existing rehabilitation commitments as approved by the DETSI into the transitional PRC Plan.

Under the EP Act, the Queensland Government is administering authority of an EA to carry out a mining activity, and the subsequent approval of a PRC Plan schedule for a PRC Plan. Under section 431A and 753 of the EP Act, if the PRC Plan schedule is not submitted by the transition date or is refused for the second time, the relevant activity authorised under the existing EA must not be carried out (ceasing operations). The EA and PRC Plan schedule includes all conditions imposed on the authority and schedule. The EP Act also prescribes the requirements for surrendering an EA, including the preparation of final rehabilitation reports and post-mining management reports.

2.3 Mineral and Energy Resources (Financial Provisioning) Act 2018

In Queensland, the *Mineral and Energy Resources (Financial Provisioning) Act 2018* regulates a financial provisioning scheme for reducing potential risks to the Government in the event an EA holder fails to meet their environmental and rehabilitation obligations. This act also amended the EP Act to require mining companies to develop PRC plans.

2.4 Progressive Rehabilitation and Closure Plans Guideline

The DETSI Guideline *Progressive Rehabilitation and Closure Plans* (PRC plan) contains information to assist applicants in developing a PRC plan as required by a PRC Plan transition notice (DES 2024). The administering authority (DETSI) must consider this guideline when making a decision about a PRC Plan schedule under section 176A of the EP Act.

2.5 Rehabilitation Requirements for Mining Resource Activities Guideline

The *Rehabilitation requirements for mining resource activities guideline* has been prepared by the DETSI to assist mining companies to propose acceptable rehabilitation outcomes and strategies. The administering authority must consider this guideline when making a decision about a PRC Plan schedule under section 176A of the EP Act.

2.6 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's key piece of legislation protecting matters of national environmental significance. Actions that will or are likely to impact matters of national environmental significance require approval from the environment minister under the EPBC Act.

The UBxP was referred under the EPBC Act (2016/7706) and was determined to be a controlled action assessed by Preliminary Documentation. Federal approval with conditions took effect 18 August 2017 with a variation issued 16 November 2017. The approval has effect until 10 August 2030.

Conditions include approval of an Offset Management Plan for a proposed offset area (306 ha) located within the mining lease to compensate for the loss of Palm Cockatoo habitat due to clearing within mine Area A. This is required prior to commencement of mining in Area A.

A second offset area and management plan is required prior to commencement of mining in Area B.

3 Stakeholder Engagement

In accordance with section 126C(1)(c)(iii) and (iv) of the EP Act, the rehabilitation planning part of the PRC plan must include:

- Details of the consultation undertaken by the applicant in developing the proposed PRC plan; and
- Details of how the applicant will undertake ongoing consultation in relation to the rehabilitation to be carried out under the plan.

Extensive consultation with Traditional Owners and the local community was undertaken to determine the most appropriate post-mining land use (outlined in **Section 4**). Stakeholder engagement regarding the Project continued, with the PMLUs discussed in this PRC Plan approved by DETSI through the land outcome document (the EA).

More recently, the above consultation requirements of the EP Act have been used to guide stakeholder engagement activities associated with the development of the PRC Plan.

Cape Commodities has identified stakeholders as part of the stakeholder engagement plan. Stakeholders include:

- Private landowners;
- Community members and organisations;
- Napranum Aboriginal Shire Council
- Aurukun Shire Council;
- Department of Environment and Heritage Protection;
- Department of Transport and Main Roads;
- Department of the Environment and Energy;
- RTA Weipa Pty Ltd;
- North Queensland Bulk Ports Corporation;
- Weipa Port Authority;
- Traditional Owners of the land.

Public consultation for the UBxP has been undertaken throughout the EA process in both formal and informal approaches. Formally, public notification was a combined process as part of the EA and mining lease, involving all key stakeholders at key project stages. Informally, meetings have been held with stakeholders, various government departments and Indigenous people in relation to cultural heritage, Native Title and the right to negotiate process.

Previously consulted stakeholders in the development of the UBxP during the inception phase are presented in **Table 3-1**. Recent consultation in respect to this current PRCP application are presented in **Table 3-2**.

Given the small scale and short duration of the UBxP and the proposal to return the land to its pre-mine land use, it is considered unlikely that stakeholder perspectives on PMLUs will change significantly during the course of progressive rehabilitation, particularly if the proposed rehabilitation activities are implemented successfully as anticipated.

Ongoing stakeholder engagement during progressive rehabilitation and closure phases has also been considered and will be undertaken in accordance with the EP Act requirements.

Further details regarding the PRC Plan annual monitoring and reporting requirements are outlined in **Section 9**.

Table 3-1 Initial stakeholder consultation

Stakeholder	Date of Communication	Topic
Private landowners	Ongoing since November 2015	Commercial in confidence
Community members and organisations	Ongoing since October 2015	Various, including opportunities for local participation
Napranum Aboriginal Shire Council	Ongoing since December 2015	Various
Aurukun Shire Council	Ongoing since December 2015	Various
Department of Environment and Heritage Protection	Ongoing since November 2015	Related to performance expectations, site surveys, approvals process and rehabilitation
Department of Transport and Main Roads	Ongoing since February 2016	Related to site access and use of State Roads
Department of the Environment and Energy	Ongoing since February 2016	Related to referral and approvals process
RTA Weipa Pty Ltd	Ongoing since April 2016	Related to access road and general expectations
North Queensland Bulk Ports Corporation	Ongoing since May 2016	Regarding port operations for the contractor
Weipa Port Authority	Ongoing since May 2016	Regarding port operations
Traditional Owners of the land	Ongoing since May 2015	Various

3.1 Traditional Owner Consultation

Traditional Owners (TO) were consulted by the previous proponent of the project. Records of the exact nature of the meetings and discussions held are not available to Cape Commodities, but the resulting EA conditions, specifically rehabilitation requirements in Table G1 outlining the re-establishment of key fauna and flora culturally important to the Traditional Owners indicate that the TO's were consulted on the proposed PMLU of native vegetation at the time of the granting of the ML and EA.

PMLUs have been previously approved through the land outcome document (the EA). There has been no material change to the proposed PMLU for any disturbance type.

A key component of the project includes the recommencement of the Stakeholder Engagement Program with Traditional Owners, mine employees and their families, Rio Tinto Aluminium Weipa, relevant government departments and local business owners directly affected by the Project.

Cape Commodities has also engaged a Community Liaison Specialist (a local TO from the project area) to serve as a vital link between the Traditional Owner Family groups and Cape Commodities. The role helps to ensure that Traditional Owner voices are heard, cultural knowledge is respected, and participation in decision-making processes is supported in line with cultural protocols and legal requirements.

3.2 Community Consultation Register

A community consultation register that complies with section 126C(1)(c)(iii) of the EP Act has been developed and will continue to be maintained and provided throughout the operational life of the UBxP. This register aims to capture ongoing discussions between all relevant stakeholders to the project. The stakeholder consultation register is a record of all consultation activities, describing the attendees, topics of discussion, outcomes, and ongoing commitments for each consultation meeting. The current version of the community consultation register (as of 24/07/2025) for the UBxP is provided in **Table 3.2**.

Table 3-2 Current Stakeholder Consultation Register

Date	Stakeholder	Type of consultation	Information provided by community	issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
27/11/2015	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email - Request for Additional Information	Request for information to better understand the scope of works proposed by the Proponent	NAK require further information about the project and advise the native title holders of the area comprising MLA100044		Supply of relevant documents relating to MLA to NAK lawyer	Document supplied: 1. Proposed Mine Program 2. Graphic representation 3. MMCL New Permit Application 4. Resource Authority Public Report
25/01/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Telephone conversation		Oresome's intention with respect to the negotiation of an agreement over the area comprising ML100044			
8/02/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email		Follow up email to telephone call of 25/01/2016		Email sent 12/02/2016 from John Cameron(JC) - Oresome Project consultant to PS to organise meeting	Chris Broadhead (CB) - Oresome Project Manager and JC in Cairns on 19/02/2016 to meet and introduce the project.
19/02/2016	Ngan Aak-Kunch Aboriginal Corporation (NAK)	Meeting in Cairns	PS and Josie Blanco (JB) - Nak Coordinator in attendance	Discussion on ORE and RTN process and proposed negotiations			
2/02/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email	Request for update meeting	Request for update meeting on the Urquhart Bauxite Project and discussions with NAK		Meeting organised	To attend the meeting and provide updates

Date	Stakeholder	Type of consultation	Information provided by community	Issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
9/03/2016	Ngan Aak-Kunch Aboriginal Corporation (NAK)	Meeting in Cairns				NAK AGM concluded with new board members elected and now in a position to advance plans to advance plans to negotiate NTA in 3 stage process. Stage 1 will involve an initial consultation with affected native title holders with a view to confirming instructions to proceed with negotiations over the grant of ML100044. Stage 2 will involve negotiations over compensation followed by drafting of a compensation agreement dealing with both Aboriginal Freehold and native title consents. Stage 3 will involve authorisation of the final agreement	Commission an economic assessment of the project from a mining economist who will also advise on compensation, Drafting of compensation agreement. Preparation of budget for Stage 1 in progress with view to commence in 1-2 weeks' time.
10/03/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email		Proposed budget prepared in relation to Stage1 of the negotiations for the grant of ML100044	Reply email from JS (15/3/2016) seeking full budget timeline and deliverables for stage 3 of the negotiations.	Reply email from Oresome (JC/CB) (16/02/2016) with outline of stage 3 program, timeline and budget and enquiry into status of ML212185 (Transport Lease)	
23/03/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email	Proposed meeting date 18-19 April 2016	Request for meeting	Reply email from JC (30/3/2016) agreeing to meet on proposed dates	Meeting organised and advance payment (50%) transferred 30/3/2016	50% of advance payment paid and meeting attendance.

Date	Stakeholder	Type of consultation	Information provided by community	Issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
30/03/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email	Seeking confirmation whether an EA was lodged with the DEHP, and if so its status.	Seeking confirmation whether an EA was lodged with the DEHP, and if so its status.	5/04/2016 reply email sent	Notice to NAK that EA is being worked on in parallel with NTA. Request for confirmation of meeting time and location with NAK Board	
5/04/2016	Philippe Savidis (PS) - Senior Solicitor CYLC Ngan Aak-Kunch Aboriginal Corporation (NAK)	Email	Meeting time yet to be confirmed.	NAK seeking further information on site disturbance, construction and operation, employment and contracting, Environmental Authority, Access		11/04/2016 email from PS confirming meeting date for 20/4/2016	11/04/2016 email from JC confirming Oresome attendance at meeting
20/04/2016	Ngan Aak-Kunch Aboriginal Corporation (NAK)	NAK Board Meeting		Oresome presented company and Ubx project to NAK board followed by discussion on various aspects of the project including Environment, Project Operations and Scope, Cultural Heritage Management, Cultural Awareness Induction, Sitting Fees and Forward Plan.		Email from PS (27/04/2016) confirming that JB and PS had met with traditional owners to discuss the proposed Urquhart Bauxite Project and they have provided their broad consent for negotiations to proceed. Details on Project Documentation and sitting fees sought.	Return email from CB/JC - confirming that unless there are significant differences, the requirement to meet with the board will be limited.
8/05/2024	Gus Gonzo - Manager Environmental Services – PRCP Assessment - Department of Environment, Science and Innovation	Email requesting information regarding access to the restricted area		Email has been forwarded to appropriate personnel for a response			

Date	Stakeholder	Type of consultation	Information provided by community	Issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
10/05/2024	Lynette Adidi- TO representative	Email providing project update		awaiting response			
10/05/2024	Anthony Whitfield - Chief Executive Officer Ngan Aak-Kunch AC RNTBC	Email providing project update		awaiting response		Copy of presentation left with PS.	
10/06/2024	Department of Resources	Meeting in Townsville regarding the haul route for the mine		Access to the restricted area, requirements to reinstate the haul route		Utilising the abandoned mine area is not an option under the current application. A development approval may need to be sought.	To engage with the TO's and Rio Tinto Weipa prior to further applications
7/08/2024	Lynette Adidi	Phone call and follow up emails with Basil Byrne	The Wik group are thinking of moving away from utilising NAK. Lyn is contacting the relevant parties for a meeting later in August and supplied a list of families/family members associated with our sites.	Many of the relevant community members work shift work and are unable to attend a meeting at the same time.	A funeral is being held mid-August where all members should be present and able to meet.	This is a culturally sensitive time, so only a short meet and greet meeting is intended at this time to introduce myself (Basil) to the community members.	To attend the meeting and provide a point of contact to the relevant parties, moving forward.
8/10/2024	Robert Dick	Community meeting		Discussion on other projects in the area (Urquhart Point Mineral Sands Project)	TO's have acknowledged that we will be approaching them in the near future to start haul route negotiations	Everyone appeared satisfied with the information provided in the presentation and are excited about the upcoming job opportunities.	To inform community as soon as approvals are in place
	Charlotte Dick			Project still awaiting environmental approvals			To keep community informed of the project status
	Austin Christie			Project needs to renegotiate haul route with the assistance of the TO's			Future opportunities to set up a haulage
	Keerin Dick						
	David Christie						
	Lylla Dick						
	Tristan Dick						
	Bridgette Adidi						
	Tremaine Gordon						
	Brieanna Gordon						
	Kailen Dick						

Date	Stakeholder	Type of consultation	Information provided by community	Issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
	Natalie Dick			Future Job opportunities			company JV with the TO's
	Janyele Adidi						Training of operators
	Lynette Adidi						
23/01/2025	Jacky Castelain	Phone call re Hey Point Access agreement and face to face meeting	Opportunity for collaboration and asset share	Options for access @ Hey Point	Wik Timber will consider options in prep for a F2F meeting	F2F meeting scheduled in Cairns for Friday 31/01/25	Book travel to attend meeting in Cairns
31/01/2025	Jacky Castelain	Face to face meeting in Cairns - Wik Timber offices		Co existence of 2 operations at Hey Point		Develop access agreement proposal for Wik Timber to consider	Sub contracting Wik Timbers' services Rental of Wik Timbers' accommodation services
10/02/2025	Jacky Castelain Gina Castelain	Teams meeting		Preliminary discussions re Sub Lease at Hey Point	Wik Timber board to discuss internally the pros and cons of sub lease	Wik Timber to develop list of acceptable conditions for sub lease	Schedule follow up meeting for 27/02/25
27/02/2025	Jacky Castelain Gina Castelain	Teams meeting		Further discussions on sub lease	Wik Timber will involve legal rep (David Meale) to progress	Ongoing discussions	Develop draft letter of support for Wik Timber to consider
11/03/2025	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Melissa Clarke Shannon Hart	Phone Call		Tenure of RA450 - Hey Point			Attend F2F meeting in Townsville - 21/03/25

Date	Stakeholder	Type of consultation	Information provided by community	Issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
21/03/2025	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Melissa Clarke Shannon Hart Luke Croton Warren Cooper Angela Miflin	Face to face meeting - 445 Flinders Street Townsville		Tenure of RA450 - Hey Point Access requirements Status of RA450		Abandoned Mines Team (Karin Fogarty) is best contact	Schedule teams meeting with Karin Fogarty to discuss process to access Hey Point
25/03/2025	Hon Minister Dale Last Ally Foley Chief of Staff Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development	Face to face discussion		Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Lack of clarity Tardiness in responses		Schedule sit down meeting with Minister	Contact Alley Foley to schedule sit down meeting with Minister
28/03/2025	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Dr Karin Fogarty	Teams meeting		Tenure of RA450 - Hey Point Access requirements Status of RA450	Legislative guidelines Legislation Department processes RA priority	Site visit to be negotiated with Wik Timber	Confirm availability to attend if required
8/04/2025	Hon Minister Dale Last Ally Foley Chief of Staff Graham Fraine - Director General Andrew Grabski - Acting Deputy Director General Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development	Face to Face meeting @ 1 William Street, Brisbane		Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Lack of clarity Tardiness in responses Uncertainty of process		Hon Minister Last delegated expediting process to determine tenure and access of RA450 to DDG Andrew Grabski	Maintain regular contact with DDG

Date	Stakeholder	Type of consultation	Information provided by community	issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
7/08/2025	Various Stakeholders from across Western Cape York	Weipa Symposium					
8/05/2025	Various Stakeholders from across Western Cape York	Weipa Symposium					
19/05/2025	Gina Castelain	Teams meeting		Follow up on informal discussions at Weipa Symposium		Maintain regular contact Support for NAK engagement	Schedule meeting with Gina and Lynette
24/05/2025	Gina Castelain Lynette Adidi	Teams meeting		Process for developing better engagement with NAK	Local TO feedback Direct feedback from Wik peoples	Consider employment opportunity to progress NAK and TO engagement	Discuss internally and inform Gina of outcome
2/06/2025	Gina Castelain Jacky Castelain David Meale	Teams meeting		Process for developing access agreement	Direct TO feedback	Continue direct engagement with WIK Timber	Continue direct engagement with WIK Timber
4/06/2025	Andrew Grabski - Acting Deputy Director General Luke Croton Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development	Email		Update on progress of RA450 Tenure		Andrew on leave	
20/06/2025	Gina Castelain	Phone call	Mentorship for Wik Timber	Mentorship for Wik Timber		Face to face meeting agreed	Travel booked to Cairns for meeting .
24/06/2025	Gina Castelain	Face to face meeting - Cairns	NAK CEO engagement Sub lease for access to Hey Point	Employment opportunity Community Liaison support Sub lease for access to Hey Point		Consideration of employment opportunity Commence development of Sub Lease	Provide role PD Develop Sub Lease

Date	Stakeholder	Type of consultation	Information provided by community	Issues raised/discussed	How issues have been considered	Decisions/outcomes of engagement	Commitments made by company
26/06/2025	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development Luke Croton Karin Fogarty	Phone call		Status of Hey Point Abandoned Mine and when site visit will be occurring	Consultation with Wik Timber to identify availability	Dates to be provided to CC once confirmed. CC will be invited to attend	Necessary travel will be made to attend once confirmed
11/07/2025	Gina Castelain	Phone call re part time position				Acceptance of offer of employment - part time	Offer of employment
18/07/2025	Gina Castelain	Phone call re stakeholder engagement	Preliminary outcome of Abandoned Mines Team visit to Hey Point				Follow up with Dr Karin Fogarty for verbal update
21/07/2025	Gina Castelain	Phone call re stakeholder engagement	Proposed NAK board meeting in Aug 25	Prep required for board meeting	Gina to obtain timing and agenda for board meeting	Gina to obtain timing and agenda for board meeting	Attend and present to NAK board
21/07/2025	Gina Castelain David Meale	Email		Draft Sub lease provide for review and consideration			Draft Sub lease provide for review and consideration
02/02/2026	Gina Castelain Chantel Chevathun	Meeting with Hugh Simmons (CC)	Require access to bore field and to ensure lease from NAK not jeopardised for Wik Timber	Months of ongoing negotiations were undertaken to reach agreement		Signing of sublease	Abide by sublease conditions
24/02/2026	Llyle Kawangka (Director – NAK) Jayne Gilbert (CEO – NAK)	Meeting in person with Basil Byrne and Hugh Simmons (CC)- Cairns	Llyle and Jayne did not turn up to meeting. Phone call initiated with Llyle	Agreement for sublease	Still under consideration	Still awaiting response from NAK	To commence mining as soon as other approvals in place.

3.3 Community Consultation Plan

To comply with section 126C(1)(c)(iv) of the EP Act, the rehabilitation planning part must include a community consultation plan detailing how ongoing consultation will be carried out in relation to the rehabilitation to be carried (**Table 3-3**).

Ongoing engagement will continue with the community focused on updates on mining and rehabilitation. The objective for consultation is to keep the community informed on the progress of rehabilitation and to provide updates in the form of discussions, presentation and site visits as required. Key stakeholders will be provided with the annual rehabilitation progress return and will be consulted of any proposed changes to the PRC Plan. All consultation undertaken will be recorded in the Community Consultation Register as detailed in **Section 3.2**.

Table 3-3 Community consultation plan

Stakeholder	Consultation Objective	Consultation Type	Consultation Frequency	Information to be Provided	How Feedback will be Considered
DETSI	Approvals and compliance for any changes to rehabilitation	Provision of any draft updates for discussion prior to finalisation	During any update to the PRCP, or proposed EA amendment	Provision of any draft updates for discussion prior to finalisation	All feedback to be considered in final submissions of any PRCP updates
Wik and Wik Way representatives (landowner and traditional owners)	Ongoing updates and agreement as landowner and Traditional Owners	PowerPoint presentations, Information package, in person discussion and site visit	Pre-commencement meeting Quarterly meetings Yearly update	Employment opportunities Updates on progress and forward plan	Considered against approvals and update rehabilitation plans if suitable and compliant
Local Councils (Aurukun and Napranum)	Ongoing updates as local council	Information package, in person discussion and site visit	Every two years	Updates on progress and forward plan	Considered against approvals and update rehabilitation plans if suitable and compliant
Other relevant regulatory bodies (Weipa Town Authority, North Queensland Bulk Ports Corporation)	Update as required for any changes to operational works	Correspondence, in person discussion	If and as required	Update any changes to operational plans	Considered against approvals and update operating procedures if suitable and compliant

Note: Frequency will vary as required

4 Post-Mining Land Use

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. In accordance with Part 3 of the *Environmental Protection (Rehabilitation Reform) Amendment Regulation 2019*, a proposed PMLU:

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

(b) satisfies at least one of the following:

- the use is consistent with how the land was used before a mining activity was carried out on the land;
- the use is consistent with a development approval relating to the land;
- the use is consistent with a use of the land, other than a use that is mining, permitted under a State or Commonwealth Act, including, for example, a planning instrument under the Planning Act 2016; and
- the use will deliver, or is aimed at delivering, a beneficial environmental outcome.

The PMLU described in Condition G1 within the EA states that the rehabilitation goal is to return native vegetation to maintain the same, or similar, pre-disturbance environmental values (**Appendix A**). Descriptions of RE's associated with the site are listed in Section 1.2.10. The rehabilitated site must also be non-polluting, safe and structurally stable with natural rates of erosion and is safe to humans and wildlife.

The PMLU of return to native vegetation is consistent with the surrounding land use and considers the reinstatement of habitat for threatened species and ensuring the reinstatement of cultural heritage values. There are limited other alternative PMLU options due to the remoteness of the site. The return of the site to a stable and safe environment is of utmost priority to ensure the continued aesthetic, cultural and ecological values currently associated with the site.

The *Cape York Regional Planning Scheme* encompasses the Project area, however, there is no associated specific land use designation.

4.1 Accordance with Stakeholders' Requests

It has been agreed with the Wik and Wikway Peoples and with state and commonwealth approval that the selected PMLUs will be representative of the pre-mining land use, with the potential for ensuring the establishment of plants of cultural significance associated with the area.

4.2 Assessment of Options

The proposed PMLU of restoring the area to native vegetation is consistent with both the land use prior to the Project, the surrounding region's land use, as well as the cultural heritage and ecological values of the Project area. Alternative PMLUs suggested in DETSI's Guideline for Progressive Rehabilitation and Closure Plans (PRC Plan) 2023, such as grazing, forestry, or cropping, are not applicable as they do not align with the historical, cultural, ecological or regional land use. Therefore, native vegetation is deemed the most suitable PMLU for the Project area and meets the requirements of the EP Regulation.

No other PMLUs have been evaluated in this PRC Plan since native vegetation was previously assessed and accepted by the administering authority of the EA. Additionally, no NUMAs are proposed.

4.3 Statutory Constraints to be Imposed

4.3.1 Voids in floodplains

The final voids proposed as part of the final landform at the Project are not located within a floodplain (**Figure 10-1**).

4.3.2 Landform stability and erosion modelling

Long-term landform stability and erosion modelling for the proposed post-mining landforms at the UBxP has not been undertaken, as it is deemed unnecessary based on the rehabilitation design and site-specific context. The post-mining landform has been designed to closely replicate pre-mining topography and integrate seamlessly with the surrounding natural landscape, thereby minimising potential triggers for geotechnical instability or erosion.

A formal target factor of safety (FoS) has not been specified as part of the rehabilitation outcomes, as conventional geotechnical stability assessments are not warranted under the conditions present at the UBxP. The Project does not involve the creation of steep slopes, engineered embankments, or residual voids that typically require quantitative stability modelling. Instead, all mined pits will be fully backfilled to within 1.7 m for Area A and 0.7 m for Area B of the original surface level, effectively restoring the original landform contours and preserving existing drainage patterns. This design approach inherently reduces the potential for slope failure or subsidence, as the landform modifications are minimal and largely within the tolerance of the natural system. Therefore, the need to define or model a factor of safety greater than 1.5 is not applicable in this context.

While PRCP guidelines recommend 3D landform modelling and formal erosion assessments for projects involving significant landform alteration or residual voids, these conditions are not present at UBxP. As such, the design does not trigger the requirement for detailed geotechnical modelling or the definition of SMART-based performance metrics related to FoS. The final rehabilitated landscape will closely mirror the original topographic profiles, as illustrated in **Figure 6-4**. Further detail on post-mining landform stability is provided in **Section 6.6.1**.

5 Rehabilitation Goals

Under section 176A(3)(c)(i) of the EP Act, mined land must be rehabilitated to a stable condition. Land is in a stable condition, as defined in section 111A of the EP Act, if:

- (a) the land is safe and structurally stable;
- (b) there is no environmental harm being caused by anything on or in the land; and
- (c) the land can sustain a post-mining land use.

These three components of stability are the general rehabilitation goals for all areas disturbed by mining in Queensland. They have been developed from the ecologically sustainable development policy framework, especially in relation to intergenerational equity, polluter pays principle, protection of biodiversity, and maintenance of essential ecological processes.

5.1 Rehabilitation Objectives, Indicators and Completion Criteria

A clearly defined set of rehabilitation objectives have been developed for the proposed PMLU (Native ecosystems) for UBxP.

For each objective, one or more rehabilitation indicators (measurements of progress towards the rehabilitation objectives) are proposed. These indicators are designed to be auditable against completion criteria, which acts as targets for the rehabilitation process. The full list of rehabilitation objectives, indicators and completion criteria is provided in **Table 5-2**. For details about how each indicator is to be measured, refer to Section 9.

The final PMLU for the project is summarised in **Table 5-1** below, together with the rehabilitation area in which they occur.

Table 5-1 PMLU location within the footprint

PMLU	Location within footprint	Explanation
Native vegetation	Located across all RAs	Restore all disturbed areas that previously supported a mapped RE to a state that reflects the pre-mining vegetation. This considers the reinstatement of habitat for threatened species impacted by the project and the plantation of culturally significant plant species to meet cultural heritage obligations

*Note: Refer to **Figure 10-2** for PMLU locations.*

Table 5-2 Rehabilitation objectives, indicators, completion criteria and assessment timeframes in accordance with EA

Rehabilitation Objective	Rehabilitation Goal	Rehabilitation Objectives	Completion criteria	Timing
A1	Safe Landscape	Create a landscape safe for humans and wildlife into the foreseeable future.	All artificial slopes within the UBxP rehabilitation area will have a slope that is <5 m tall and <25% or 14° (1V:4H).	At the completion of rehabilitation earthworks.
B1	Stable Landscape	Create a stable landscape with natural rates of erosion.	No active rill, gully or sheet erosion is to be visible within the UBx rehabilitation area	Sites are to be monitored every two years
B2		Establishment of stabilising vegetation	Density and composition of species comparable to analogue sites (as measured against site specific BioCondition Benchmarks- Table 9-5).	Three years after vegetation establishment
C1	Visual Amenity	Create a vegetation community similar to that which occurred onsite previously, and which blends visually with the surrounding landscape.	Density and composition of species approaching analogue sites (as measured against site specific BioCondition Benchmarks- Table 9-5).	Rehabilitation monitoring regime will include: • Quick check assessment (6-9 months); • Early assessment (18 months); • Interim assessment (3 years); and • Performance monitoring (5 years +).
D1	Functional, Self-sustaining Vegetation Community	Create a functional native vegetation community with the ability to be self-sustaining	Presence of seedlings or suckers (<2 m in height) of dominant canopy species from analogue sites within each rehabilitation site (measured against site specific BioCondition Benchmarks -may not be measurable for several years).	Rehabilitation monitoring regime will include: • Quick check assessment (6-9 months); • Early assessment (18 months); • Interim assessment (3 years); and • Performance monitoring (5 years +).
			The organic litter cover in rehabilitation sites should exceed the 10th percentile among reference sites.	

Rehabilitation Objective	Rehabilitation Goal	Rehabilitation Objectives	Completion criteria	Timing
			Native species richness within a 10 m x 50 m area within each rehabilitation site should exceed the 10th percentile among reference sites. The site should be free of declared weeds defined under the Biosecurity Act 2014. UBxP rehabilitation areas must achieve a BioCondition score between 50 -75, based on benchmarks relevant to an analogous regional ecosystem and site-based attributes. Rehabilitation monitoring must be undertaken by an appropriately qualified person as per the methodology outlined in this plan (Section 9.1.2).	
E1	Recolonisation by Culturally Significant Species	Create habitats that support recolonisation by flora and fauna culturally important to Traditional Owners	The understorey of rehabilitation sites should be dominated (as assessed by percentage cover) by native grasses, which are the primary food source of Agile Wallabies, and contain <i>Vigna</i> spp. <i>Erythrophleum chlorostachys</i> should be recorded within rehabilitation surveys or supplementarily planted from tube stock. <i>Dioscorea</i> spp. should be present in rehabilitation sites not significantly less than extent in un-mined areas with the same communities as the rehabilitated area.	Rehabilitation monitoring regime will include: • Quick check assessment (6-9 months); • Early assessment (18 months); • Interim assessment (3 years); and • Performance monitoring (5 years +).

Rehabilitation Objective	Rehabilitation Goal	Rehabilitation Objectives	Completion criteria	Timing
F1	Resistance to Natural Stresses	Create ecosystems that resemble neighbouring unmined forests in their ability to respond to fire, droughts and cyclones.	The vegetation community at rehabilitation sites must persist over multiple wet seasons.	Rehabilitation monitoring regime will include: • Quick check assessment (6-9 months); • Early assessment (18 months); • Interim assessment (3 years); and • Performance monitoring (5 years +).
			The vegetation community must fulfil the majority of completion criteria after having experienced a fire within the previous five years.	Within 5 years of a fire
G1	Minimal impacts to water values	Minimal post-mining impacts to surface catchments, the groundwater environment, water quality and volume.	Quality characteristics (Aluminium, pH, suspended solids, Turbidity, Sulphate and Electrical conductivity) should not have three consecutive exceedances of baseline groundwater contaminant limits (see Table 9-7) during operations. Post mining quality characteristics should reflect the pre-mining baseline characteristics listed in Table 9-7 .	• Groundwater measured monthly during operations. Post- mining groundwater quality characteristics recorded are similar to pre-mining levels.
			Groundwater levels are returned to pre-mining levels	• Groundwater measured monthly during operations. Post- mining groundwater levels recorded are similar to pre-mining levels.
			Turbidity, pH, TSS, Aluminium for receiving waters must be within the limits listed in Table 9-6 .	• Surface water measured daily during release event (the first sample must be taken within 2 hours of commencement of release)

Rehabilitation Objective	Rehabilitation Goal	Rehabilitation Objectives	Completion criteria	Timing
H1	Rehabilitation of roads within the Project area	The internal haul road area is approximately 22ha. The rehabilitation objective for the haul road is to restore the area to its pre-mining condition.	Site return to pre-mining state as evidenced by photographic record.	Prior to achieving the final post mining land use criteria
			The site should be free of declared weeds defined under the Biosecurity Act 2014.	Prior to achieving the final post mining land use criteria
			No active rill, gully or sheet erosion is to be visible within the UBxP rehabilitation area.	Prior to achieving the final post mining land use criteria
I1	Rehabilitation of infrastructure within the Project area	The rehabilitation objective for the infrastructure area is to restore the area to its pre-mining condition.	Native species richness within a 10m x 50m area within each rehabilitation site should exceed the 10 th percentile among reference sites.	Rehabilitation monitoring regime will include: • Quick check assessment (6-9 months); • Early assessment (18 months); • Interim assessment (3 years); and • Performance monitoring (5 years +).
			The site should be free of declared weeds defined under the Biosecurity Act 2014.	
			No active rill, gully or sheet erosion is to be visible within the Ubx rehabilitation area.	
			No patches of exposed, bare soil (<5% cover of vegetation organic litter) should exceed 25m ² in area.	

6 Rehabilitation Methodology

In accordance with section 126C(1)(e) of the EP Act, this section describes the rehabilitation methodology for the Project. No NUMAs are proposed.

6.1 Infrastructure decommissions and removal

6.1.1 Infrastructure to be decommissioned

Certain rehabilitation areas (such as RA3 – Mine Infrastructure Area) contain infrastructure requiring removal once decommissioned.

The overall objectives of decommissioning are that:

- Hazardous materials are identified and managed;
- Infrastructure is safely dismantled or demolished and removed;
- Erosion rates are managed to levels that do not compromise the post-mining land use;
- Runoff water quality does not present a risk of environmental harm;
- Landforms are safe, stable and non-polluting to achieve the post-mining land use; and
- Ongoing management requirements are similar to unmined land.

All infrastructure within the Project area, such as the workshop, fuel/chemical storage, crib room, admin building, and all ancillary equipment (pipelines, water tanks, generators) will be removed, de-contaminated, rehabilitated and decommissioned in compliance with PMLU milestones. All infrastructure-related waste material, such as tyres, will be demolished/removed and disposed of at an appropriate offsite facility. Light vehicle and heavy vehicle tracks will be ripped prior to reshaping and topsoil application to ensure vehicle compaction of the substrate is minimised.

As part of the final landform, shallow, free draining depressions across the In-pit dump Area A and Area B are proposed (see **Section 6.6**). Mined areas will be backfilled with screened waste material from the bauxite and overburden and drainage structures, such as berms and rock checks, will be installed where required, on and around the final landform to ensure that the landform is free draining.

6.1.2 Infrastructure to be retained

As discussed in **Section 1.4**, no infrastructure within the project area will be retained at the conclusion of the project.

6.1.3 Remediation and/or Removal of Contamination

Potential sources of contamination include pollutant seepage from hydrocarbon and chemical storage areas and active mining pits. Hydrocarbons and chemical stocks stored on site will be drawn down in the lead-up to closure so that only small residual volumes are required to be managed. At decommissioning, residual hazardous materials and hydrocarbons will be managed in accordance with the site's operational waste management plan. Specific measures will likely include:

- Disposal of industrial wastes via a licensed contractor, which will be used primarily for flammable, waste oil and putrescible wastes;
- Excavation of any ground contaminated by hydrocarbons for bioremediation where possible or for disposal via a licensed contractor;
- Removal of hazardous and industrial wastes from site by a licensed contractor, where appropriate; and

- Management of any residual contaminated areas may include on-site remediation, or encapsulation on-site to prevent the release of contaminants.

Once infrastructure has been removed from site, a contaminated land assessment will be undertaken to validate that all hazardous material has been removed and the area is suitable for the agreed final land use. A contaminated land assessment plan will be developed within the final year of the mine life. The assessment will include fuel, chemical, waste storage/transfer areas, and any other identified potentially contaminated sites.

In accordance with the *Guideline for contaminated land professionals* (EHP, 2012), contaminated soil is to be remediated in accordance with the following hierarchy:

- Where possible, contaminated soil will be treated and remediated on site, using techniques that are in accordance with the National Remediation Framework (CRC CARE, 2019) or any Queensland regulatory guidelines.
- If this is not practicable, contaminated soil will be excavated and treated off-site so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which the soil is returned to the site;
- If the above are not practicable, contaminated material will be removed to an approved waste facility. Any disposal of contaminated soil will be undertaken in accordance with all relevant regulations and legislation and will only be carried out following the approval by the Queensland Government of an application for a disposal permit for contaminated soil.

Once a contaminated land assessment has confirmed a site is suitable for the agreed final land use, the site will be left physically stable with clean fill imported where required and the areas reshaped to a landform that resembles, to the maximum extent practicable, the pre-mining landform. Once landform design is complete, the area will be ready for an application of cover material (**Section 6.7**) and revegetation (**Section 6.9**).

6.2 Hydrogeology

As described in **Section 1.2.7**, the groundwater at the UBxP is characterised by a highly permeable and ephemeral shallow system, with seasonal discharges into wet/marshlands, mangroves, and the sea. Infiltration following rainfall is both rapid and substantial. Beneath this shallow groundwater system lies a deeper, saline aquifer, separated from the shallow aquifer by an aquitard of Kaolinite clay, which is approximately 5 m thick.

The local coastal dunes, estuarine, and deltaic deposits are not considered a viable long-term groundwater resource. This is due to the fine-grained nature of the sediments, which makes groundwater extraction difficult, as well as the presence of saline groundwater and the risk of saltwater intrusion, which limits the sustainable use of the coastal aquifers.

The UBxP area itself can be considered a groundwater island, surrounded by a constant head of water along its northern, western, and southern boundaries due to its proximity to the coastline. Additionally, a complex system of surface water channels formed by the high rainfall during the wet season further influences the area. The eastern side of the ML is also affected by Leithen Creek, its tributaries, and drainage channels linked to Triluck Creek.

Groundwater investigations and modelling conducted during the EA application process in 2016 concluded that post-mining groundwater conditions at UBxP are unlikely to be adversely affected. Bauxite removal is expected to have minimal impact on the discharge from the shallow aquifers, except where the bauxite serves as a significant source of baseflow. Typically, the water table within the bauxite is present only during the wet season, if at all. During the dry season, the water table generally falls to depths of 4 to 8 m below the base of the bauxite. In the dry season, streamflow is largely maintained by baseflow from the kaolinitic strata, meaning mining will have a negligible effect on the baseflow or deep baseflow component of the water balance.

However, there is potential for the underlying groundwater table to recharge via the pit floor during rainfall events. This recharge is anticipated to occur only during the wet season when sufficient rainfall is available to infiltrate the pit and recharge the groundwater. To mitigate any risks, all previously mined pits will be backfilled with overburden before the wet season begins.

Geochemical modelling indicates that backfilling the pits with overburden will not negatively affect the underlying groundwater regime, even when recharged by rainfall. The mixing of fresh recharge percolated through the backfill material and

groundwater is a natural process. Given the distinct seasonal variations at UBxP, rainwater infiltration will decrease, and evaporation will increase during the dry season, causing outflow to the groundwater regime to cease. During the wet season, seepage from the pits, driven by rainfall, is expected to occur.

The Rio Tinto EIS submission (RTA, 2011) investigated the potential impacts and mitigation measures associated with altered catchment hydrology within the South of Embley project area. Modification of local hydrology was identified as likely to increase maximum salinity levels in the early and late dry season, resulting in potential dieback of riparian vegetation and changes to ecotonal vegetation communities. These negative impacts are particularly associated with the damming of perennial creeks for water storage. There are no permanent creeks or water storage dams proposed within the UBxP. Other salinity hazards associated with clearing and mining, were deemed to be low. The high rainfall for the area and well drained nature of the bauxite profile suggests that any lower landscape salinity problems would already be evident. Typically, the water table is within the bauxite layer only at the height of the wet season, if at all. In the dry season, the water table typically falls to 4 to 8 m below the base of the bauxite. Despite the removal of the bauxite layer during mining, saline water is unlikely to affect native vegetation in the rehabilitation plots as the saline water table is well below the growth zone during the dry season when the groundwater is at its most saline.

Regional estuarine wetlands, located south of Area B (Triluck Creek and Winda Winda Creek) and west of Area A (Roberts Creek), will not be impacted by mining activities. Modelling shows that mining will not affect these creeks, and any short-term reduction in groundwater discharge is unlikely to harm groundwater-dependent ecosystems (GDEs), which are already adapted to the existing conditions and primarily receive discharge water from February to June. Additionally, mining will not intersect the deeper aquifer, ensuring that it remains unaffected.

The potential for groundwater contamination is considered low. Onsite chemical and fuel storage will be confined to bunded areas in the Mine Infrastructure Area (within shipping containers), and there is no risk of acid mine drainage due to the benign nature of the target bauxite, topsoil, and subsoil (see **Sections 6.4 and 6.5**). Overall, the risks to the aquifers from short-term drawdown or contamination are minimal. Cause-and-effect monitoring will be conducted quarterly onsite to ensure ongoing protection of the groundwater system.

6.3 Flooding

A flood plain is defined as the peak water level 0.1% annual exceedance probability (AEP) for a relevant watercourse, as modelled under the guideline Australian Rainfall and Runoff (Ball et al, 2019).

The Queensland Government's floodplain assessment overlay mapping has been used to identify if any areas within the UBxP are susceptible to flooding and are considered as a floodplain. The Rapid Hazard Assessment layer in **Figure 6-1** illustrates such mapping with respect to the proposed UBxP footprint. Evident by **Figure 6-1**, the Embley River flood plain surrounds the UBxP, yet all of the project footprint is outside of this flood plain extent.

Flood mapping for the region indicates that operational areas are unlikely to be impacted by flooding (Queensland Government, 2024a). Flood modelling was undertaken for the adjacent Urquhart Point Mineral Sands Project (UPMSP) during the 2013 EIS process by VDM Consulting. The modelling focussed on two primary sources of inundation at the UPMS: ephemeral catchment flooding from the Hey and Embley River systems, and tidal or storm-surge event from the Arafura Sea, both of which are relevant for the UBxP. Four flooding scenarios were modelled and determined to be the most relevant to the Project. These scenarios included:

- Mean High High-Water (MHHW): RL1.1 m AHD;
- Highest Astronomical Tide (HAT): RL1.63 m AHD;
- Inferred 1 in 100-year Flood Level (Flood): RL2.52m AHD; and
- Inferred 1 in 100-year Flood Level Plus Storm Surge Allowance (Flood + Surge): RL3.32 m AHD.

The two tidal scenarios, MHHW and HAT, were developed using data collected from nearby infrastructure facilities including the Humbug Barge Terminal, Hornibrook Ferry Terminal, and Hey River Barge/Ferry Terminal. The inferred 1 in 100-year flood

level was based on a combined catchment area of 1,750 km² for the Hey and Embley Rivers, and average rainfall estimates for the Weipa region. The modelling assumed a typical peak storm duration of 12 hours. For a 1 in 100-year rainfall event, the Weipa region experiences an average rainfall intensity of 23 mm/hr, resulting in a peak flood flow of approximately 10,100 m³/s in the Embley River adjacent to the UPMSP, incorporating contributions from the upstream Hey River catchment.

A simplified hydraulic capacity analysis of the Embley River (at the UPMSP) for a 1 in 100 flood event yielded the following results:

- Minimum river width: 1,700 m;
- Average flow depth: 7 m below maximum tide level;
- Typical flood velocity: 0.9 m/s at outlet into river; and
- Calculated flood capacity: 10,700 m³/s

Utilising the Inferred 1 in 100-year Flood Level Plus Storm Surge Allowance (Flood + Surge) level of RL3.32 m AHD, a Flood surge Risk layer was developed for the UBxP to indicate the highest potential flood risk for the project area (**Figure 6-1**). All operational and infrastructure areas are unlikely to be impacted by wet season flooding events and will not interfere with wet season flow.

Flooding of rehabilitated areas as a result of ephemeral catchments would only occur if local drainage channels were altered as a result of mining, removing the natural flood protection of the dunal landforms. Local drainage channels are not proposed to be altered, with mining operations avoiding these areas.

As required in condition PRCP14 of the PRCP schedule, a flood assessment report will be undertaken by an AQP by December 2028 and submitted to the administering authority.

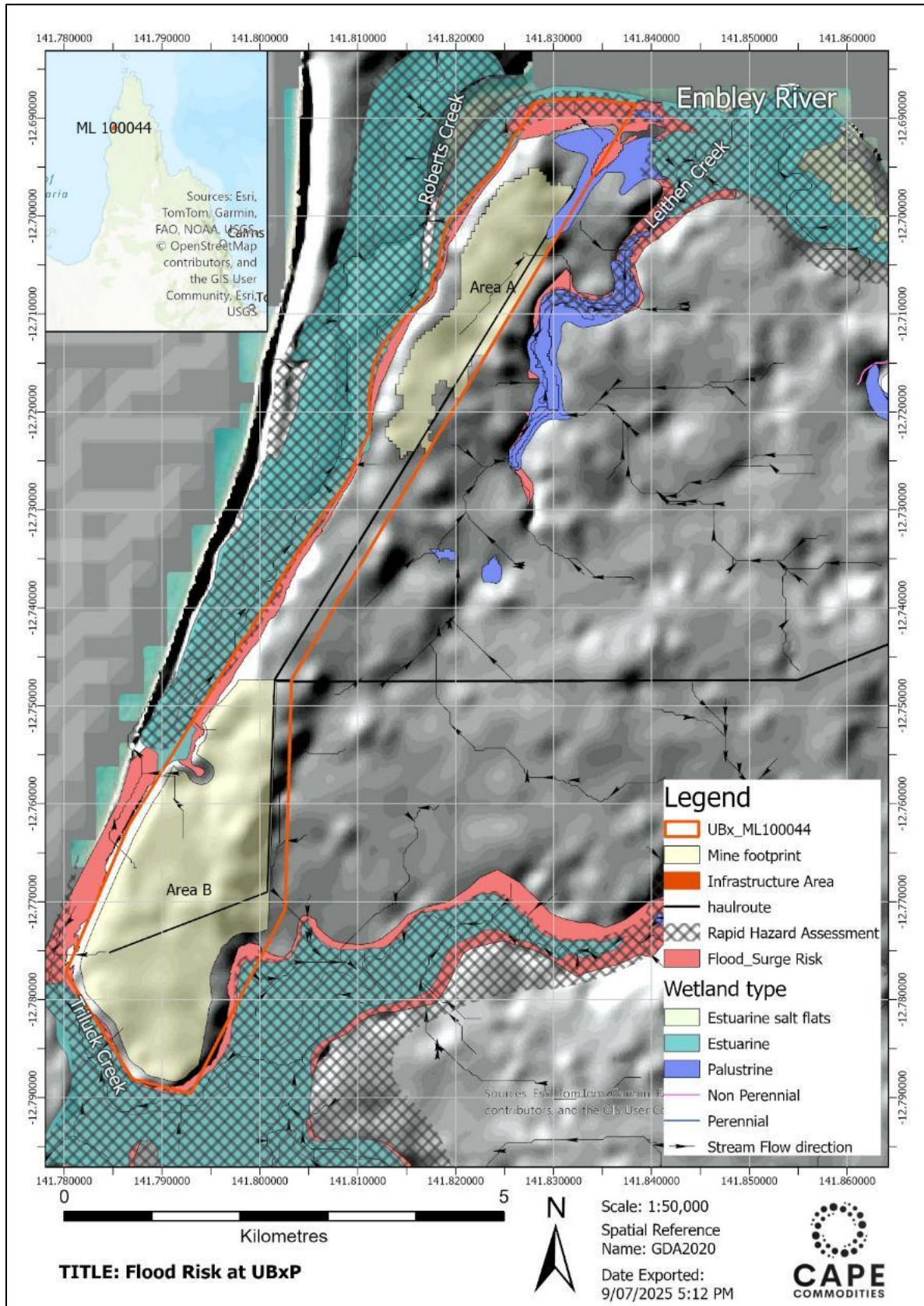


Figure 6-1 Potential flood areas and wetland areas in relation to UBxP disturbance footprint.

6.4 Soil and capping material assessment

Soils within the UBxP area are naturally high in aluminium and are classified as Red Kandosol, characterised by the abundance of bauxitic nodules throughout the profile. The B horizon is slightly acidic and has a very low base status (dystrophic). Yellow Kandosol is also present, occurring on lower slopes and along drainage lines, and is highly acidic. These soils exhibit rapid infiltration, but their limited ability to retain water makes it challenging for vegetation to establish. The permeability of these soils ranges from high to very high, and the erosion hazard is classified as low. As a result, erosion and sediment control (ESC) should be relatively easy to manage, with minimal impacts expected from ground disturbance.

For rehabilitation purposes, the soil at UBxP is classified into four main types including:

- Topsoil: the uppermost 30 cm of the soil profile, rich in organic matter, microorganisms, and the natural seed bank. It serves as the principal growing medium for regenerating plants;
- Subsoil: underlying soil horizon beneath the topsoil and above the bauxite layer, with an average thickness of 3 m. It is primarily composed of loams with low nutrient content but high porosity, providing good water drainage;
- Bauxite: a layer of pisolitic or semi-pisolitic bauxite, averaging 1.8 m (Area A) thickness. This layer constitutes the ore to be extracted for export at the UBxP; and
- Kaolinite and ironstone: finely textured, often hard, non-cracking clays found beneath the bauxite layer. These materials are typically less conducive to plant growth but are important in the soil profile.

If soil needs to be stockpiled during mining operations, topsoil and subsoil will be stored separately to ensure the highest retention of the natural seed bank, promoting successful rehabilitation (see **Section 6.4.1**).

It is estimated that approximately 1.94 million m³ of topsoil and 2.71 million m³ of subsoil is within the Project disturbance area and would therefore be available for use in mine site rehabilitation. Based on the proposed vegetation approach, there is sufficient available topsoil for it to be placed on rehabilitated areas at a thickness of approximately 0.25 m in order to complete the proposed rehabilitation program associated with the Project. Any surplus material remaining in the final year will be added to the cover applied to the last rehabilitated areas.

All materials to be used for rehabilitation are to be sourced locally from within the disturbance footprint of the Project. The principal materials required (topsoil and subsoil) are extracted from the disturbance footprints prior to disturbance, such that the amount required for rehabilitation is always available. No other cover materials (clay, rock) are required to achieve the target rehabilitation methodology. Any other materials (e.g., fertilisers, nursery supplies) are to be purchased from commercial suppliers.

6.4.1 Soil Handling and Placement

Topsoil will be windrowed separately with minimal handling to preserve its structural integrity. Movement of topsoil will generally take place during the dry season, before operations shut down prior to the onset of the wet season. After topsoil is stripped from a disturbed area, subsoil material above the ore body will be removed and stockpiled separately from the topsoil. As mentioned above, the separation of topsoil and subsoil is crucial in best preserving the integrity and health of the available topsoil, increasing the success rate of natural revegetation once respread.

Wherever possible, overburden (topsoil and subsoil) removed from one block will be placed directly into areas requiring rehabilitation, rather than stockpiling. If stockpiling is unavoidable, soil will not be stored for longer than a single dry season. If stockpiled soil becomes wet, plant seeds and microorganisms will decompose and lose viability. All topsoil handling and placement will occur only during the dry season, when there is limited possibility of soil damage or compaction. It is essential that no water-based dust control methods be employed during overburden removal or in the vicinity of topsoil stockpiles.

Overburden from the first panels mined each dry season will require stockpiling. With this in mind, priority for the first panels mined each year will go to panels with the thinnest overburden, to minimise space required for stockpiles and amount of double-handling required. **Figure 6-2** illustrates the sequence of topsoil and subsoil removal and backfilling as mining progresses.

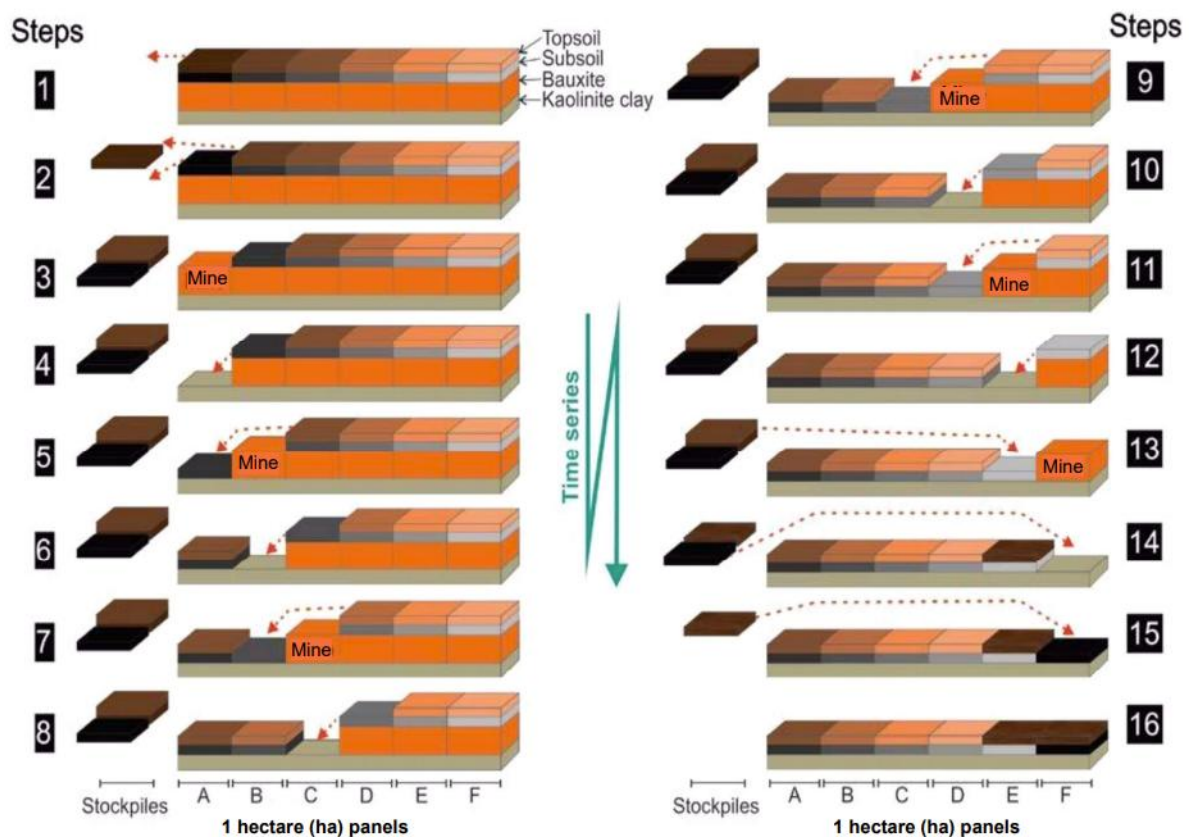


Figure 6-2 Mining Sequence per panel

Soil will be removed using scrapers, to minimise mixing of soil types/depths. The removal of the topsoil profile will be performed with two to three cuts of the scraper and stockpiled at the edge of the mining panel. The remaining overburden will be removed with a scraper and deposited directly into the adjacent mined panel. Direct placement of subsoil on the mine floor will be undertaken prior to the deposition of topsoil.

For freshly removed topsoil, the following management practices will be applied:

- A topsoil inventory will be maintained to ensure enough material is available for rehabilitation. Since pits vary in size and topsoil depth, immediate return may not always be possible. Typically, 10 cm of topsoil from the first cut will be placed over 15 cm of second-cut topsoil, mimicking the root zone requirements of the vegetation;
- Topsoil will be stripped when moist and friable. Due to the project's short duration and small block sizes, topsoil clearing will begin at the start of each shift when soil moisture is present;
- Stockpiles will be kept below 2 m and stored for no more than three months, located to minimise handling and preserve soil structure (Australian Government, 2016); and
- Prior to respraying, topsoil will be inspected for weeds. Any detected will be treated with herbicides or by scalping to remove seeds and potential seed banks. Given the short storage duration during the dry season, weed establishment is unlikely.

6.4.2 Surface Preparation

Appropriate and correct soil placement and surface preparation methods are critical for successful rehabilitation. Subsoil will be placed directly from pre-mined panels onto mined panels. Topsoil will be deposited in piles, with each scraper load forming one pile, and a 1 m gap between piles. The piles will be smoothed with a dozer to create a topsoil profile approximately 50 - 60 cm thick (5-10 cm for first cut, 20 – 25 cm second cut, 30 cm third cut – with final thickness determined by the rehabilitation

trials). A minimum of 50 cm growing medium will be returned over the overburden. It is important to match the thickness of the topsoil to within 5 cm of its original depth to avoid future shortages.

Soils will be spread to mimic the natural topography, creating gently undulating slopes with minor troughs and depressions, while avoiding unnatural bunds or piles. In low-lying areas prone to runoff, drainage sumps will be created to promote water infiltration and prevent ponding.

Before overburden and topsoil placement, the mine pit floor will be deep-ripped using a tined dozer to fracture the compacted floor. The tines should penetrate at least 0.5 m into the mine floor, restoring natural water infiltration into the underlying geologic formations.

Following ripping, screened material, overburden and subsoil will be placed, progressively backfilling behind the active mining zone. The subsoil surface will be contoured to match the surrounding topography, ensuring a free-draining final landform. Finally, topsoil will be spread across the surface, taking care not to rip the topsoil, as this would disturb the seed bank and interfere with natural seedling emergence.

6.4.3 Mulching and Timber Placement

Successfully restoring soil during periods of water scarcity and heavy inundation presents a significant challenge, particularly in terms of retaining water within the soil profile and protecting the soil surface. One effective solution is the use of organic mulch, which has been shown to offer several benefits. Research demonstrates that organic mulch helps mitigate the negative effects of rain erosion (Lee et al., 2018; Conrad et al., 2008; Navarro-Pedreño et al., 2017; Solgi et al., 2021), regulate soil temperature (Abdi, Fields, and Beasley, 2023; Navarro-Pedreño et al., 2017), and increase soil organic matter (Conrad et al., 2008). It also plays a crucial role in maintaining soil moisture, controlling evaporation (Conrad et al., 2008; Benigno, Dixon, and Stevens, 2013), and improving biological activity (Navarro-Pedreño et al., 2017). Furthermore, organic mulch enhances soil fertility, boosts cation exchange capacity, and increases plant nutrient availability (Grant et al., 2016). It can also reduce weed presence (Navarro-Pedreño et al., 2017), diminish soil compaction (Conrad et al., 2008), and provide shelter for small invertebrates and reptiles (Grant et al., 2016).

Stockpiled felled vegetation, including cleared vegetation from the initial stages of the UBxP's construction, will be chipped to a course size using a commercial-sized woodchipper mobilised to site. The mulch will be spread in 1 m wide bands, with 3 to 4 m gaps between the bands (approximately the width of the grader). These mulch bands will protect the topsoil from erosion, while the deliberate gaps between mulch bands will promote germination of native plants. A portion of large logs from the cleared areas will not be mulched, instead will be placed on the rehabilitation sites on top of the mulch bands to allow the grader to access the non-mulched strips. Large, intact logs will provide important habitat refuge for the rehabilitated native ecosystem.

Mulch will be applied during the dry season to minimise moisture loss, preserve the seedbank in the topsoil, and reduce topsoil erosion. The addition of mulch will also increase organic carbon levels, enhance water retention, and improve soil structure by providing more exchange sites for essential cations. Furthermore, it helps prevent the oxidation of organic matter into greenhouse gases like carbon dioxide and nitrous oxide, or the reduction of methane.

The final landforms proposed for the UBxP will have maximum slope angles of 25% or 14° (1V:4H) and be less than 5 m in height. No specific anchoring of mulch is considered necessary for the rehabilitation areas at the UBxP. The low slope angles, combined with buffering undisturbed vegetation around the site, help mitigate the risk of significant mulch movement due to wind erosion, especially since wind speeds rarely exceed 20 km/h (5.5 m/s) in the dry season. Additionally, research indicates that mulching materials like pine bark, with a similar density to the mulch intended for the UBxP, can reduce soil dust by up to 80% at ground wind speeds of 4 m/s, further limiting wind erosion risks (Qu et al., 2019). The UBxP's shallow, undulating dunes and the absence of ephemeral watercourses in disturbance areas minimises the potential for mulch to enter receiving waters during the wet season. Adequate mulch application, both in depth and coverage, will further reduce the risk of downslope dispersal, ensuring effective soil stabilisation until vegetation is established (Lin et al., 2018).

The stockpiled felled vegetation will be repurposed as mulch across each rehabilitation area within the UBxP. Coarse wood chip mulch is known for its high hydraulic conductivity (Fér et al. 2022), which facilitates effective infiltration of rainfall and

surface water through the mulch layer into the underlying topsoil and backfill material. However, excessive compaction of either the topsoil or mulch layers can reduce this conductivity, potentially resulting in surface water ponding. Practices such as anchoring or surface ripping may introduce unnecessary compaction and are therefore avoided, as they could hinder infiltration and disrupt the intended hydrological function. The gently undulating landform design, in combination with appropriate mulch application techniques, is not expected to lead to significant erosion of the mulch layer. As an additional safeguard, monitoring measures detailed in Section 9 will help detect any excessive surface erosion early, enabling timely corrective actions to ensure compliance with rehabilitation milestone completion criteria.

Mulching has been shown to significantly enhance seedling survival, growth, and seed emergence in rehabilitated areas. For example, mulch applied to a depth of 50 mm on an historic sand mine in coastal NSW greatly improved seedling performance compared to un-mulched plots, although no significant differences were observed in soil parameters like moisture retention (Cummings et al., 2005). Further supporting this, field trials in Georgia, USA, on highly erodible Sandy Clay Loam soils demonstrated a 99% reduction in soil loss under wood mulch during simulated storm events. Mulches applied to a depth of 3.75 cm (without additional anchoring) were highly effective in reducing stormwater runoff, runoff rate, and soil loss. A combination of compost and wood mulch performed best, reducing suspended solids by 99% (Faucette et al., 2007).

For effective coverage, the typical mulch thickness ranges between 50–100 mm on well-drained sites, depending on the specific rehabilitation objectives. Thicker mulch (75–100 mm) is recommended for erosion control and moisture retention, while a thickness of 50–75 mm is adequate for seed protection and weed suppression (Navarro-Pedreño et al., 2017). If mulch is too thin, it fails to protect against moisture loss and erosion, while excessive thickness could smother emerging vegetation. As part of the rehabilitation strategy to be implemented at the UBxP, Cape Commodities will trial mulch application at 75–100 mm during the first dry season of rehabilitation, followed by assessments during quick-check surveys to ensure the mulch thickness is appropriate for both erosion control and weed suppression. Quick-check surveys will record if mulch is visually present, if so, an estimated depth of mulch layer and details of erosion and presence of weed emergence from the mulch layer. Further details on the quick-check survey provided in Section 9.

The mulch applied to rehabilitated slopes at the UBxP is expected to remain stable over time, even as it undergoes decomposition. This stability is primarily attributed to the gentle slope angles of the reconstructed landforms. According to the *Australian Soil and Land Survey Field Handbook* (Speight, Biggs, and Morand 2024), slopes are classified as steep when they exceed 23°. In contrast, the rehabilitated slopes at the UBxP average between 5–6°, with a maximum of 15°, well below the threshold for steepness. These modest gradients significantly reduce the potential for mulch displacement, helping to ensure it remains in place and functional until a stable vegetation cover is established.

The mulch layer is intended as a short-term protective measure to safeguard the soil from degradation during the period between topsoil placement and vegetation establishment. As vegetation becomes established, the mulch will gradually break down and integrate into the topsoil profile, eventually being supplemented and replaced by natural leaf litter. During the dry season, when most ground cover species have senesced, the mulch will continue to provide essential surface protection. Ground cover regeneration typically occurs rapidly following the onset of wet season rains, a pattern also observed in the nursery topsoil trials at an adjacent operation.

6.4.4 Capping requirements

No reactive waste or geochemically unstable materials will be produced during the mining or screening activities, so there will be no requirement for capping materials for treatment of areas on site. Vegetation and oversize matter screened from the target bauxite will be the only return to the pits from the mining process, aside from the removed overburden, topsoil layers and mulched vegetation.

6.5 Waste Characterisation

The UBxP is not expected to generate reactive or geochemically unstable mineral waste materials during mining or screening. Soil and geological assessments conducted during the EA application process concluded that the materials handled during

operations are highly unlikely to produce acidic metalliferous drainage, given the shallow nature of the material being excavated (Epic, 2016).

6.5.1 Acid Sulfate Soils (ASS)

Acid Sulfate Soils (ASS) are naturally occurring sediments and soils containing iron sulphide minerals or sulphide materials. Typically found in low-lying coastal environments below 5 m Australian Height Datum (AHD), ASS are stable and non-reactive when saturated. However, when exposed or drained, the sulphides in the soil come into contact with oxygen, causing oxidation. This process produces sulphuric acid, which can harm the environment and structures, and may also release metals such as aluminium and iron into the surrounding area.

ASS investigations in the surrounding areas of the Amrun Project did not identify the presence of ASS in soil samples (RTA, 2011). No prior on-site assessment has been conducted to test for or identify ASS at UBxP. However, desktop mapping of ASS by the Atlas of Australia (sourced from CSIRO, 2015b) indicates that all of Mine Area A and most of Mine Area B have an extremely low probability (<1% chance of occurrence) of ASS presence (**Figure 6-3**). A portion of Mine Area B (approximately 40%) is classified as having a low possibility (6-70% occurrence) of ASS, with 2% of the area classified as high probability (>70% occurrence), located on the very outer edge of the disturbance area. Based on the contour data, it is likely that the high probability rating in the southern section of Area B is a resolution error, rather than the likelihood of ASS occurrence in the clearing footprint.

The risk of ASS at UBxP is limited due to several factors. Mine Areas A and B are situated at elevations ranging from 8 to 18 mAHD, an elevation range where Potential Acid Sulfate Soils (PASS) are unlikely to occur and ground disturbance is not expected to exceed depths of five metres AHD. Geological mapping (Weipa 1:250K Geological Series Map Sheet) shows that soils outside of Mine Areas A and B are primarily Holocene quartzose sands, which are typically associated with ASS but lie outside the mining scope. Drilling results from 2015 and 2016 confirm that overburden in Mine Areas A and B consists of sandy clay, sand, and gravel units, with bauxite underlain by ironstone, kaolinitic ironstone, kaolinite, and sands of the Bulimba Group. The higher-risk intertidal and estuarine Quaternary sediments, which are associated with ASS, are found outside Mine Areas A and B and are not part of the project's mining plan.

Only the outermost edge of Mine Area B and areas outside both mine areas exhibit landscape features associated with ASS, such as stabilised dunes and deeply weathered plateaus. Given the shallow excavations planned and the focus on avoiding coastal fringes, the potential for encountering ASS in the disturbance areas at UBxP is considered minimal.

In accordance with the Environmental Authority's condition G10, an Acid Sulfate Soil Management Plan (ASSMP) will be developed, following the latest edition of the Queensland Acid Sulfate Soil Technical Manual (Queensland Government, 2024b). Prior to the development of the ASSMP, field surveys to identify any potential Acid Sulfate Soil areas within the clearing footprint need to be undertaken prior to disturbance, as outlined in EA condition G9. Once the soil has been analysed, the ASSMP can be developed based on the likelihood of exposure of acid soils. This plan will be implemented by Cape Commodities to manage and treat any ASS encountered, and to prevent the release of contaminants into water or land.

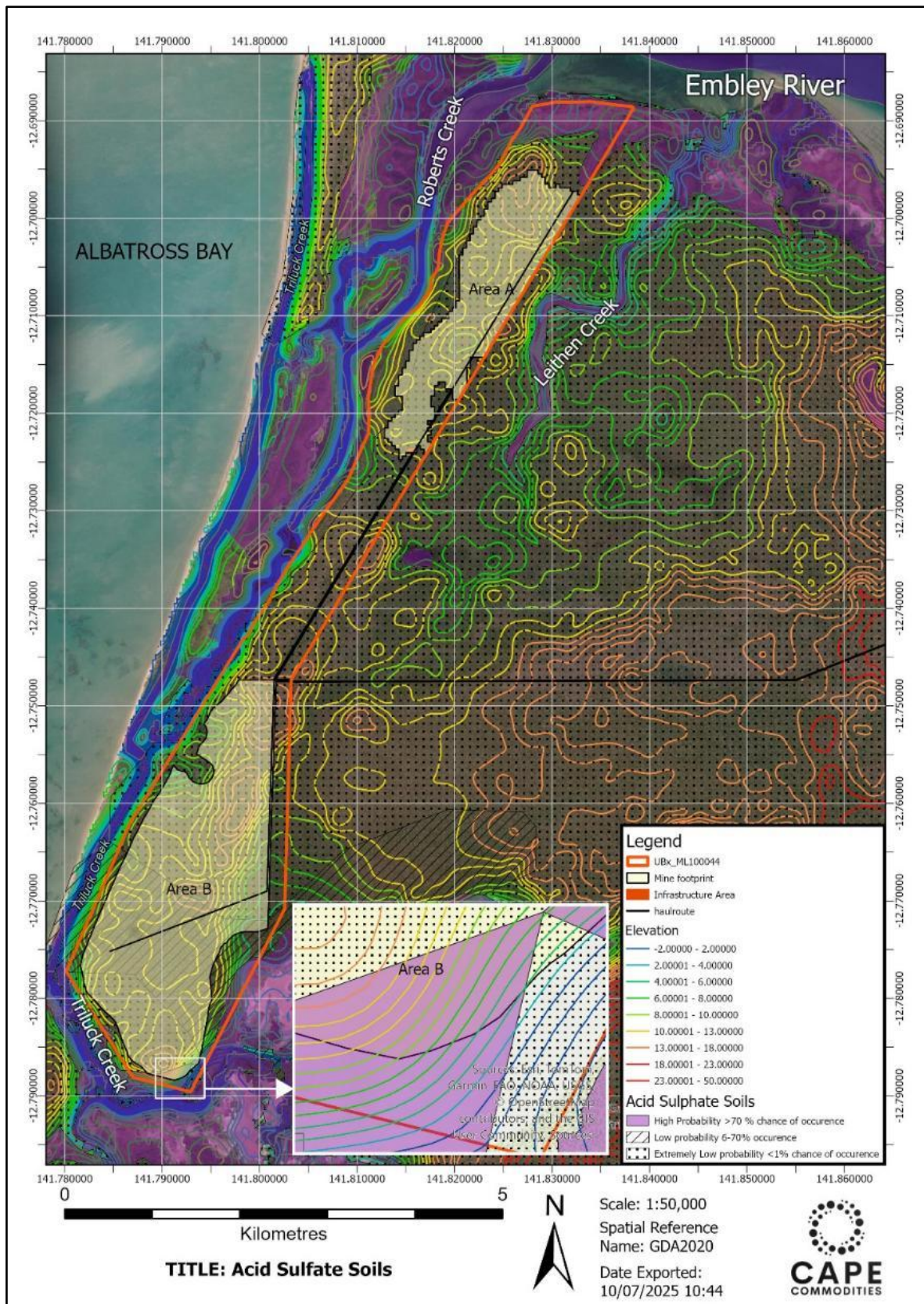


Figure 6-3 Presence of Acid Sulfate Soils in relation to UBxP disturbance areas

No waste materials, other than overburden, fine and oversized rejects, and vegetation, will be disposed of on-site. All other waste, including hydrocarbons and rubbish, will be removed from the site and disposed of at an appropriate facility in Weipa.

Spill kits will be readily available in workshop areas and in the dangerous goods container to manage and contain any minor spills. In the event of an incident that causes or threatens to cause pollution or significant environmental harm, the administering authority will be notified within 24 hours of the incident becoming known, in accordance with the EP Act.

6.6 Landform Design

6.6.1 Overview

The UBxP EA requires that all surface areas significantly disturbed by mining activities must be rehabilitated to achieve a safe, stable, and non-polluting landform with self-sustaining vegetation cover. These requirements have founded the basis of the final rehabilitated landform designs for the UBxP.

Compared to the mining of other minerals, bauxite mining represents a relatively minor alteration to the original landscape. On the western Cape York Peninsula, bauxite occurs as a relatively thin (average thickness of 6 m) cap over underlying kaolinitic, ironstone clays. Bauxite mining typically results in the lowering of the ground surface by 0 to 5 m. In the case of the UBxP, rehabilitated mining surfaces are expected to be lowered by no more than 2 m from the area's pre-mining topography. Unlike adjacent bauxite operations, the UBxP mined material will not be processed prior to shipping, beyond basic screening of oversize material. Consequently, less than 10% of the screened material will be returned as backfill to the mining voids.

Both mining areas (Area A and Area B) are located on naturally elevated pre-mining landforms and the proposed final landforms will have shallow depressions, with the downslope edges designed to blend with the natural contours. This approach ensures that all landforms remain free-draining. This contrasts with the deep, water-filled voids commonly seen in many other open-cut mining operations.

The post-mining final landform for the UBxP has been designed to closely resemble the pre-mining landscape by incorporating the low relief, dunal system in which the UBxP is situated.

The following rehabilitation areas will feature a post-mining landform that closely mirrors the original topography:

- RA 3 – Mine Infrastructure Area; and
- RA 4 – Haul Road.

Where minor modifications to the original landform takes place during construction or operations, earthworks undertaken to reshape the closure landform to a state that reasonably resembles the original landscape.

The following rehabilitation areas will possess a final landform that deviates from the pre-mining landform:

- RA 1 – In-pit Dump Area A; and
- RA 2 – In-pit Dump Area B.

A topographical design plan has been developed to illustrate the final post-mining landform for the Project. **Figure 6-4** compares the pre-mining topography with the post-mine landform topography across mine Areas A and B. This post-mining landform design is based on the following data and assumptions:

- The depth of ore to be removed from across the mine blocks was based on exploration drilling data and associated resource mapping and mine planning;
- A conservative swell and compaction factor applied to screened and overburden material to be utilised in pit backfilling;
- Design plans account for the placement of subsoil and topsoil after mining and pit backfill;
- Mining Area A and B pits were designed with maximum batter slopes of 25% or 14° (1V:4H), which are expected to be safe and stable in the long term.

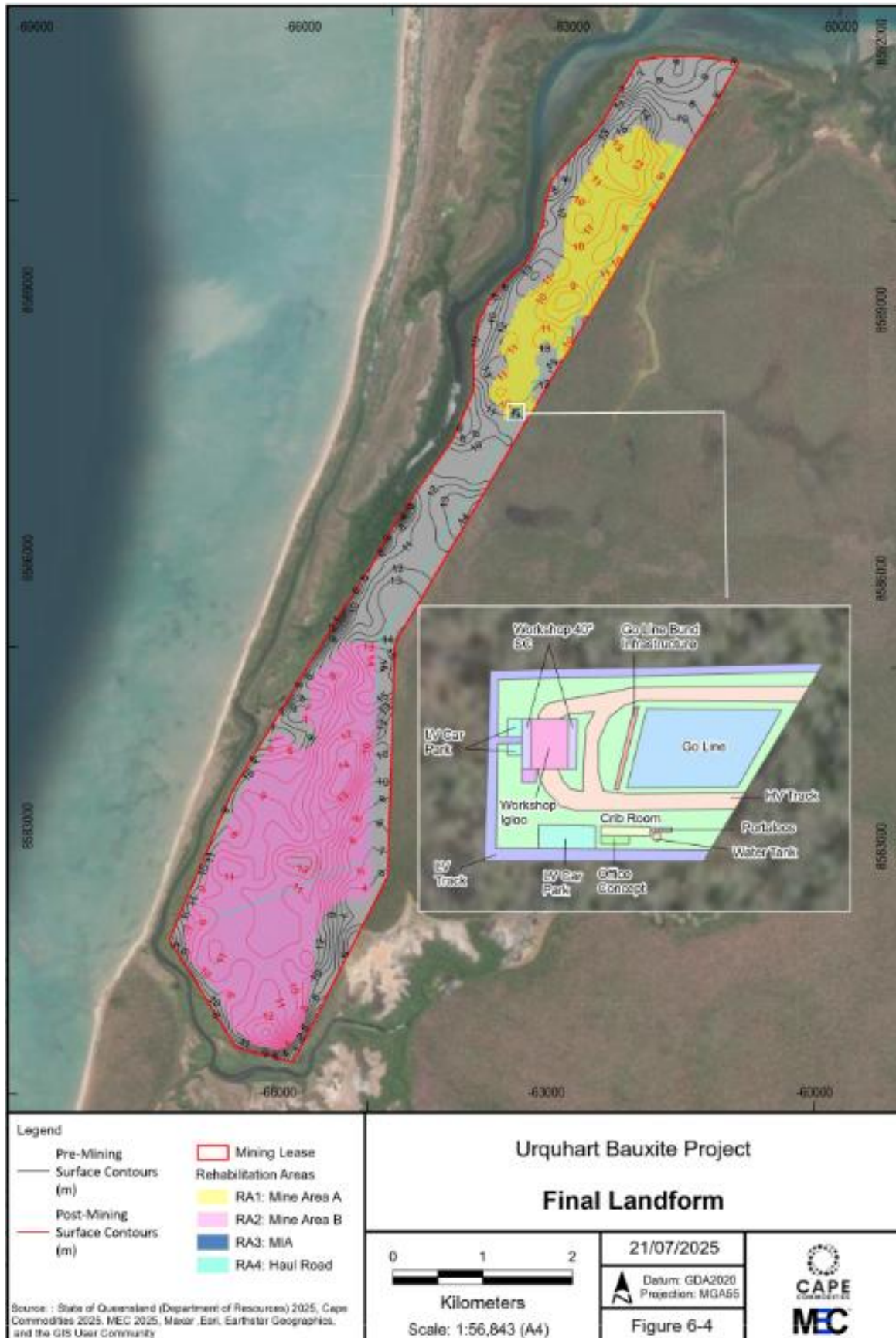


Figure 6-4 Final landform topography

6.6.2 Void Closure

Section 126D of the EP Act defines a void as "an area of land to be excavated in the carrying out of a mining activity." As a result, while the minor lowering of the ground surface in each of the two mining areas will not obstruct water flow or cause surface pooling, these areas still qualify as "voids" under the EP Act's definition.

Both Area A and Area B are classified as "voids", and as such, will be rehabilitated to a stable state, with a post-mining land use (PMLU) of native vegetation in accordance with the EA. The Queensland Government guideline, Progressive Rehabilitation and Closure Plans, outlines the information that must be included in a PRCP for sites with proposing voids. Some of the required information—such as long-term water balances, void water levels, stratification within the void, and water quality within the void—are not applicable to the UBxP due to the shallow, free-flowing nature of the voids remaining after closure. Relevant information concerning void closure is provided in the following subsections.

Options for Reducing Voids

The footprints of the voids are constrained by the extent of the extractable resource. Due to the shallow nature of the resource, only open-cut mining techniques are economically viable for extraction. This results in free draining, shallow voids that are between 0 and 2 m in depth.

Final Dimensions of Voids

The final dimensions of voids are summarised in **Table 6-1**.

Table 6-1 Dimensions of Voids

Mining Area	Void	Maximum Length (North-South)	Maximum Width (East-West)	Depth ¹
Area A	Stage 1	0.19 km	0.97 km	Maximum of 2 m
Area A	Stage 2	0.37 km	0.96 km	Maximum of 2 m
Area A	Stage 3	0.64 km	0.8 km	Maximum of 2 m
Area A	Stage 4	0.96 km	0.83 km	Maximum of 2 m
Area A	Stage 5 i	0.72 km	0.96 km	Maximum of 2 m
Area A	Stage 5 ii	0.16 km	0.48 km	Maximum of 2 m
Area A	Stage 6 i	0.12 km	0.20 km	Maximum of 2 m
Area A	Stage 6 ii	0.76 km	0.52 km	Maximum of 2 m
Area A	Stage 6 iii	0.08 km	0.12 km	Maximum of 2 m
Area B ²	Stage 6 iv/Stage 7	4.68 km	1.81 km	Maximum of 2 m

¹Void tends to be deepest at or near the upslope wall and merge with the natural ground level downslope.

²Area B highly unlikely to be disturbed or mined due to a lack of resource definition.

Void Wall Slopes

At closure, all mining area void walls will have a maximum slope of 25% or 14 deg (1V:4H). Note that all voids will be contoured to match the natural ground level at the perimeter, so the slope presented above represents the highest walls of each void. Given the proposed shallow nature of the voids and the designed maximum 25% slopes, void walls are expected to maintain their stability until vegetation is established across the footprint.

Groundwater predictions

As outlined in **Section 6.2**, the water table (the uppermost saturated zone) during the dry season typically lies 4 to 8 m below the base of the bauxite zone targeted by mining operations. However, during the wet season, when rainfall recharges the shallow groundwater system, the water table has the potential to rise above the base of the bauxite (pit floor). To mitigate the risk of groundwater pooling or ingress into residual voids during the wet season, mining will be restricted to the dry season, from April to December, depending on the timing of the wet season. Furthermore, all mining areas disturbed throughout the year will be backfilled with overburden at the end of the dry season, filling the void to well above the base of the bauxite.

At closure, all voids will be backfilled to within 2 m of the surrounding topography. It is extremely unlikely that the groundwater table will rise above the rehabilitated void surface. Overall, the risk of groundwater inflows into the shallow post-mining landform voids is minimal.

Rehabilitation Strategies

Voids and void walls will be rehabilitated using the same revegetation approaches as for other disturbed landforms within the project area (see **Section 6.9**). These are standard practices at other bauxite mines, with a low probability of failure.

6.7 Cover Design

A cover system is typically required to manage the exposure of reactive waste materials, such as those that may produce acid-mine drainage. The primary goal of these systems is to prevent the release of contaminants into the environment, avoid long-term legacy issues, and ensure successful rehabilitation.

Geological analyses conducted as part of the EA application in 2016 indicate that there are no geochemically unstable materials or other chemicals posing an environmental risk within any of the project's rehabilitation areas. As a result, the cover design is straightforward. In areas where screened materials and overburden are deposited following the excavation of bauxite (rehabilitation areas RA1 and RA2), the consolidated materials will have a variable thickness. Over this, an additional 350 mm of subsoil and 250 mm of topsoil will be spread to serve as a growing medium for vegetation, and 75 mm mulch for erosion protection, as indicated in **Figure 6-5** below.

When available, and where vegetation clearing in one area coincides with rehabilitation in another, mulch will be applied at an appropriate depth (~75 mm but will depend upon rehabilitation trial results). In other rehabilitation areas, where only surface disturbance occurs to the soil profile, the topsoil (approximately 250 mm) removed prior to disturbance will be returned to the area.

The 60 cm of soil placed over the backfilled material (overburden and screened materials) will be sufficient to support plant growth. Studies of *Eucalyptus tetrodonta* forests in northern Australia have shown that 77-90% of root biomass occurs in the upper 0.5 m of soil (Eamus *et al.* 2002). The benign geochemistry of the backfilled material further suggests that it will not present a significant barrier to plant roots, including species that rely on deep taproots to access groundwater or other resources.

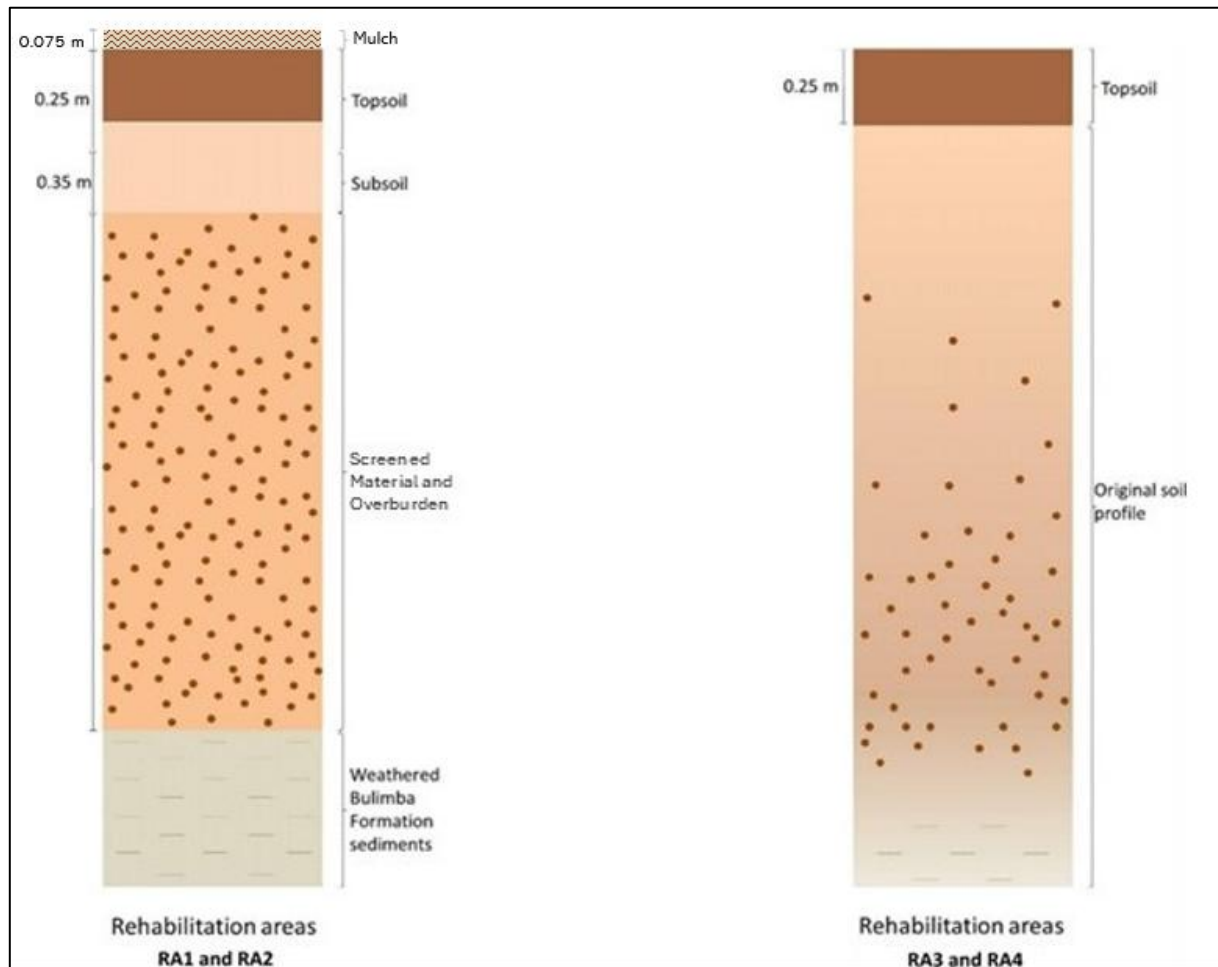


Figure 6-5 Cover Design in UBxP Rehabilitation Areas

6.7.1 Landform Stability

The final landforms described in **Section 6.6.1** are expected to remain stable in the long term, supported by the following evidence:

- Most post-mine landforms either retain their original gradient or profile (such as rehabilitation areas RA 3 and RA 4) or have very low gradients similar to those naturally found in the landscape (rehabilitation areas RA 1 and RA 2);
- Void slopes will be contoured to less than 25% and blended in with the low relief, dunal topography which exists across the UBxP area;
- Where pre-mining surfaces of RA3 and RA4 have slopes steeper than 25%, the slope will be reduced to less than 15% while preserving the original dune direction. This approach ensures that overland flow during the wet season is properly managed, and the post-mining landform retains the same overflow regime;
- The region's geology is chemically stable, with minimal risk of generating acidity, salinity, or dissolved metals from screened material or exposed pit walls;
- The soils are non-dispersive, as outlined in **Section 1.2.8**; and
- Additionally, the nearby long history of open-cut bauxite mining at Weipa provides valuable large-scale examples of stable landforms being successfully achieved using similar methods, which can be considered trials for the UBxP.

Lessons learned from other mine rehabilitation programs in dunal systems, such as those on North Stradbroke and Fraser Islands, have been investigated to inform the stability risks of the proposed post-mine landforms at the UBxP. Case studies

have shown that low-relief dune landforms, typically with slopes of less than 25%, are generally stable without the need for additional stabilisation techniques. In fact, the use of artificial material binders, such as bitumen, can sometimes hinder revegetation success (Brooks, 2000).

One technique that has proven effective in improving landform stability in other projects is the application of mulch on the final landform surface. This mulch layer helps reduce the loss of landform material due to wind and surface water erosion (Finucane, Hardmand, & Harley, 2006). Consequently, mulch will be spread across all backfilled landform surfaces at the UBxP to enhance landform stability.

6.8 Water Management

Rehabilitation of the mined pits will begin with the progressive backfilling of the pit using the return of overburden. Once the pit has been sufficiently backfilled with overburden and reshaped to recreate the pre-mining drainage directions, a 0.35 m thick layer of subsoil followed by 0.25 m topsoil layer will be placed and spread across the backfilled pit footprint. Finally, mulch will be spread across the topsoil layer in preparation for revegetation.

The materials proposed for pit backfilling, including overburden and screened material, are chemically inert and pose no risk of generating acidic metalliferous drainage. Given the inert nature of these materials, the final landforms at the UBxP are not expected to contaminate the surrounding environment, particularly groundwater or surface waters. However, hazardous substances used during operations and rehabilitation activities—such as diesel, lubricants, oils, degreasers, paint, and cleaning agents—could present environmental risks.

The primary potential Contaminants of Concern (CoC) are hydrocarbons from fuel storage areas or minor spills, and sediments resulting from vegetation clearing and mining activities. While hydrocarbons are unlikely to disperse via surface water due to operations occurring only during the dry season, they could potentially reach groundwater if a significant spill occurs, seeping through the pit floor to the underlying water table. Sedimentation in receiving waters is also unlikely during operations given that the mined and rehabilitated areas will be lower than the pre-mining topography and will retain the majority of runoff and sediment during the wet season (Greencap, 2015).

In summary, contaminants may enter the environment through the following pathways:

- Groundwater interception in pits, creating a direct connection between mining operations and the groundwater aquifer;
- Seepage through highly conductive sand substrates into the underlying groundwater; and
- Overland flow from operational areas into ephemeral drainage lines following rainfall.

CoC refer to substances that may adversely affect water quality, including surface water, groundwater, and the broader environment, as a result of mining activities at the UBxP. **Table 6-2** summarises these CoCs, including their sources, pathways, and potential environmental fates.

Table 6-2 Contaminants of Concern: Source, Pathway and Fate

CoC	Source	Pathway	Fate
Turbidity	Land clearing removing vegetation, increasing soil's susceptibility to erosion.	Soil erosion from wind and water mobilising soil into receiving surface waters	Deterioration of receiving surface water quality (increased turbidity).
Hydrocarbons	Mining equipment and machinery	Equipment breakdown causing incidental spill to surrounding environment.	Hydrocarbons can enter receiving surface waters or underlying groundwater aquifer should spill not be responded to correctly.

The site has a small catchment area, resulting in fleeting surface water, with the majority of rainfall occurring between December and March. Despite high flows during the wet season, the site's highly permeable sandy soil and high evaporation rates lead to rapid loss of surface water after rainfall. As a result, there is no standing water during the dry season.

Mining operations at UBxP will be confined to the dry season (April to December), when rainfall is minimal. The risk of overland flow from operational areas is low, as mining occurs exclusively in the dry season. Disturbed areas will be rehabilitated before the wet season, with erosion and sediment control measures in place (**Appendix C**).

Pit dewatering is not expected at the UBxP. All pits are designed to remain above the groundwater table during the periods where active mining will occur (dry season), preventing the need for dewatering. If groundwater is unexpectedly encountered, operations in that area will pause, and work will shift to a shallower ore reserve until groundwater levels decrease. The affected pit will be mined and rehabilitated later in the season, prior to the wet season.

With successful landform restoration and vegetation cover, long-term changes to surface water flows are not anticipated. Before the wet season begins, rehabilitated areas will be reshaped to mirror the natural dune system and the pre-mining overland flow regime. No surface water diversions are planned for the UBxP.

The surface water monitoring program for the UBxP is designed to meet the conditions specified in Schedule E of the EA, ensuring that water quality aligns with the objectives outlined in EA Table E2. Cape Commodities is committed to preventing any degradation of water quality in surrounding saltmarshes, Roberts Creek, Embley River and Albatross Bay, as well as ensuring no measurable degradation of underlying aquifers.

6.9 Revegetation

6.9.1 Revegetation Objectives

The projected final land use of the UBxP is native vegetation resembling the community present onsite prior to mining, consistent with traditional land uses.

The following are the revegetation objectives for the site, consistent with the proposed PMLU of native vegetation:

- Create a landscape safe for humans and wildlife into the foreseeable future;
- Create a stable landscape with natural rates of erosion;
- Establish vegetation communities that resemble those originally found onsite, which blend visually with the surrounding landscape and vegetation;
- Establish functional, self-sustaining vegetation communities;
- Re-establish key fauna and flora culturally important to Traditional Owners, including *Dioscorea spp* (yam) and *Erythrophleum chlorostachys* (Cooktown Ironwood), an important tree for making woomeras (spear throwers) and home to native honey bees;

- To ensure declared weed species are not introduced, nor weeds of importance to the Wik People;
- Establish ecosystems that resemble neighbouring unmined forests in their ability to respond to fire, termites, droughts and cyclones; and
- Ensure minimal post-mining impacts on surface catchments.

6.9.2 Key Flora Species

The key flora species selected to be re-established during rehabilitation (**Table 6-3**) reflect those of the main RE to be cleared:

- RE 3.2.10 (*Eucalyptus tetradonta* and *Corymbia clarksoniana* +/- *E. brassiana* or *Erythrophleum chlorostachys* woodland on stabilised dunes);
- RE 3.3.20 (*Corymbia clarksoniana* or *C. novoguineensis* woodland on alluvial plains); and
- RE 3.5.36b (*Eucalyptus tetradonta* and *Corymbia nesophila* woodland to open forest on undulating plains and remnant plateaus)

Some areas may need rehabilitation with *Melaleuca* species more suited to ephemeral swamps due to the lowering of the ground surface in relation to the wet-season water table, however these are expected to be minimal.

Table 6-3 Regional Ecosystems to be reinstated within the mining footprint, with dominant species present in each RE.

Species	Eucalyptus / Corymbia woodland			Melaleuca		
	3.2.10	3.3.20 (was 3.5.22)	3.5.36b (was 3.5.2)	3.3.49 (was 3.3.42)	3.3.50 (was 3.3.14b)	3.2.4
<i>Acacia platycarpa</i>	Subcanopy	Subcanopy				
<i>Acacia rothii</i>	Shrub layer		Shrub layer			
<i>Acacia torulosa</i>	Subcanopy					
<i>Banksia dentata</i>		Subcanopy				
<i>Corymbia clarksoniana</i>	Canopy					
<i>Corymbia nesophila</i>			Canopy			
<i>Corymbia novoguineensis</i>	Subcanopy	Canopy		Canopy		
<i>Corymbia stockeri</i>			Canopy			
<i>Erythrophleum chlorostachys</i>	Subcanopy	Subcanopy	Subcanopy			
<i>Eucalyptus brassiana</i>		Canopy				
<i>Eucalyptus tetradonta</i>	Canopy	Canopy	Canopy			
<i>Grevillea glauca</i>	Subcanopy		Subcanopy			
<i>Grevillea parallela</i>	Subcanopy					
<i>Litsea glutinosa</i>	Subcanopy					
<i>Livistona muelleri</i>		Subcanopy				
<i>Lophostemon suaveolens</i>		Canopy				
<i>Mallotus nesophila</i>	Subcanopy					
<i>Melaleuca leucadendra</i>					Canopy	Canopy
<i>Melaleuca stenostachya</i>		Subcanopy				
<i>Melaleuca viridiflora</i>	Subcanopy	Subcanopy		Canopy	Subcanopy	Canopy

Species	Eucalyptus / Corymbia woodland			Melaleuca		
	3.2.10	3.3.20 (was 3.5.22)	3.5.36b (was 3.5.2)	3.3.49 (was 3.3.42)	3.3.50 (was 3.3.14b)	3.2.4
<i>Owenia vernicosa</i>	Subcanopy					
<i>Pandanus spiralis</i>				Subcanopy		
<i>Parinari nonda</i>	Subcanopy	Canopy				
<i>Persoonia falcata</i>		Subcanopy				
<i>Planchonia careya</i>	Subcanopy					
<i>Sersalisia unmackiana</i>	Subcanopy					
<i>Syzygium suborbiculare</i>	Subcanopy					
<i>Chrysopogon elongatus</i>					Grass	Grass
<i>Chrysopogon setifolius</i>		Grass				
<i>Cymbopogon refractus</i>		Grass				
<i>Dapsilanthus elatior</i>						Sedge
<i>Eragrostis pubescens</i>	Grass					
<i>Eriachne trisetia</i>		Grass				
<i>Eulalia mackinlayi</i>		Grass				
<i>Fimbristylis acicularis</i>					Sedge	
<i>Heteropogon triticeus</i>	Grass		Grass			
<i>Imperata cylindrica</i>				Grass		Grass
<i>Lomandra longifolia</i>	Understory					
<i>Microstachys chamaelea</i>	Understory					
<i>Mnesithea rottboellioides</i>		Grass				Grass
<i>Panicum seminudum</i>	Grass					
<i>Pseudopogonatherum irritans</i>	Grass	Grass				
<i>Sarga plumosum</i>	Grass					
<i>Schizachyrium pachyarthron</i>	Grass					
<i>Thaumastochloa pubescens</i>	Grass					

The revegetation program will rely on a combination of passive regeneration through the soil seed bank, direct seeding and planting. Most grass and understorey species are annuals or perennials that seed annually and are therefore well represented in the soil seed bank and generally will not require direct seeding.

In contrast, canopy and subcanopy flora species may need to be supplemented with direct seeding and/or tube stock to meet the rehabilitation criteria. Seed bank trials are proposed (refer **Section 6.9.6**) to understand which species are most likely to self-germinate from each soil type to be cleared, although the Project will also draw on local experience and rehabilitation programs being undertaken on bauxite mines elsewhere in northern Australia.

Of note, certain woody species, such as the dominant tree *E. tetradonta*, do not seed every year and rely heavily on root suckers and re-sprouting from lignotubers for propagation. Soil seed banks generally contain insufficient quantities of this key canopy species, and these will be supplemented by direct seeding and tube stock planting.

An updated comprehensive flora survey will be undertaken to confirm the key species in the planned clearance area and to confirm the location of similar vegetation analogue (reference) sites before clearing begins.

Further information of the proposed seed mix is provided in **Table 6.4**.

6.9.3 Species of Conservation Significance

Few species of conservation significance are known to utilise *Eucalyptus tetrodonta* woodlands exclusively as habitat, and no species identified from the site are restricted to this habitat. Habitats for significant species were primarily located along the coastline and in nearby vine forest and wetlands, and the mine plan adapted to avoid these areas.

The Cooktown Orchid (*Dendrobium bigibbum*), and potentially the Chocolate Tea-tree Orchid (*Dendrobium johannis*) are the only likely threatened flora to be encountered on site (based on previous flora surveys). Given their detection during surveys was restricted to the vine thickets, they are unlikely to be encountered in the vegetation type to be cleared. Targeted pre-clearance vegetation surveys will be undertaken by a qualified botanist to identify any orchids and potentially re-locate any threatened flora detected. The process for relocating orchids is outlined within the Rehabilitation Management Plan (**Appendix E, Section 6.2**), however the introduction of orchids back into rehabilitated areas is not a focus, given they are usually located outside the RE's slated for disturbance.

Ensuring species are present within the rehabilitation areas that have been identified as cultural important to the Traditional Owners, is a condition of the EA as outlined in Table G1 of the EA. Specifically, re-establishing key food species will be a target of the rehabilitation objectives, including the reestablishment of *Vigna* spp., Yams (*Dioscorea* sp.), Cooktown Ironwood (*Erythrophleum chlorostachys*) – which houses native bees and provides a source of honey, and native grasses, which are the primary food source of the Agile Wallaby (*Macropus agilis*).

The reinstatement of habitat structural features (large trees, branches) during rehabilitation efforts will ensure continuity of shelter for native fauna between habitat patches. As vegetation develops, birds will return to fruiting food-source trees.

Through the reinstatement of vegetation, UBxP will be able to maintain its rehabilitation objective of re-establishing key fauna and flora culturally important to Traditional Owners.

6.9.4 Topsoil Management

Topsoil contains important fungal spores that contribute to native vegetative health. Most Australian plants depend upon symbiotic relationships with mycorrhizal fungi that assist with increasing the root surface area available for uptake of water and nutrients, particularly from the aged and infertile soils at the site. Topsoil will be placed directly within rehabilitated mining panels to preserve the viability of mycorrhizae fungal spores. Biologically active soils are crucial for the healthy growth of regenerating vegetation. Rehabilitation works at Gove showed that stockpiling topsoil beyond a single dry season could destroy fungal communities in the Australian monsoonal tropics. The Project will seek to avoid stockpiling topsoil for long durations.

The following management measures will be implemented to prevent loss and maintain fertility of the topsoil:

- The top 10 cm of topsoil will be windrowed separately to the remaining topsoil to preserve the seed bank, with minimum movement to ensure soil structural features are maintained;
- Topsoil windrows will not be greater than 2 m in height;
- Movement of topsoil will occur in the dry season and prior to the shut-down of operations;
- Topsoil from mining areas will not be stockpiled for longer than three months;
- Topsoil from the haul road areas will be stockpiled as windrows along the haul road, covered with mulch, and allowed to self propagate over the wet season.
- Weed inspections and control will be undertaken prior to the spreading of stockpiled topsoil.
- A soil berm will be erected at the lower side of the stockpiles remaining over the wet season to contain any sediment run off.

6.9.5 Revegetation Approach

Soil Spreading

The placement of topsoil is crucial for successful rehabilitation. For UBxP, a dozer with a tine attached will be used to deep-rip the pit floor, then subsoil (overburden) will be placed directly from pre-mined panels onto mined panels by trucks and spread by a dozer.

Subsoil will be spread in a manner that mimics the natural topography of gently undulating slopes, creating a landscape of minor troughs and depressions, but lacking unnatural-looking bunds or piles. In low-lying areas where substantial run-off may occur, drainage sumps will be created to promote water infiltration and prevent excessive ponding. The sandy nature of the subsoil will promote water infiltration and movement of rainfall through seepage pathways, promoting development of ephemeral seepage reservoirs on the edges of the reserve.

After subsoil has been landscaped, topsoil will be deposited directly in piles (one scraper load = one pile), with a minimum gap between piles. Piles will then be smoothed out using a dozer to produce a topsoil profile that reflects reference sites (approximately 25 cm thick). It is important that the topsoil is placed at a thickness similar to that from where it was removed. Excessive topsoil placement will lead to future shortages and will not promote improved rehabilitation success.

Fertiliser and Soil Amelioration

The Rehabilitation Plan (Oresome, 2017) stated single superphosphate will be added at the time of sowing at a rate of 200 kg/ha for soil enrichment. Superphosphate granule size varies; small granules can be combined with seeds for a single application. If larger granules are used, seeds tend to fall between the gaps, leading to an uneven distribution of seed. Adding superphosphate to the seed mix is preferred, as it acts as a marker for areas that have been seeded, to enable a more even spread.

Seed/fertiliser will be spread by hand or using a fertiliser spreader (a single-compartment hopper) combined with an agricultural tractor.

It is noted the application of commercial fertilisers could be problematic for local species; its use will be assessed in the proposed field rehabilitation trials to be undertaken in the first year of rehabilitation.

Seed mix and seeding

Only species native to the site will be planted. All seed will be sourced locally, either directly from within the UBxP footprint or in the local Weipa area.

Seed collection will be conducted annually, with Traditional Owner engagement to ensure cultural species are represented. For select species that retain seeds in the canopy, seeds will be harvested during the clearing process from the fallen trees, prior to mulching. Seeds will be processed, dried, and stored under controlled conditions to maintain viability, with older stocks prioritised for use. Additional seed may be sourced from nearby mines to ensure sufficient supply.

The proposed initial seed mix for Area A is presented in **Table 6-4**. This will be refined based on the findings of rehabilitation trials and throughout the rehabilitation process. Also, further analogue sites will be surveyed prior to clearing in Area A to finalise the species mix for RE3.2.10, and to identify the species present in RE3.3.20 in the north of the site.

Table 6-4 Proposed seed mix

Species	Habit	RE3.2.10a	RE3.3.20	RE3.5.36b
		321 ha (Area A/B)	46 ha (Area A/B)	406 ha (areaB only)
		g/ha	g/ha	g/ha
<i>Acacia crassicaarpa</i>	Tree		x	x
<i>Acacia platycarpa</i>	Tree	50	X	X
<i>Alphitonia excelsa</i>	Tree	100	X	X
<i>Atalaya variifolia</i>	Tree	100		
<i>Brachychiton muellerianus</i>	Tree			X
<i>Canarium australasicum</i>	Tree		X	X
<i>Corymbia nesophila</i>	Tree		X	X
<i>Corymbia novoguineensis</i>	Tree	500	X	
<i>Corymbia stockeri</i>	Tree			X
<i>Erythrophleum chlorostachys</i>	Tree	500		X
<i>Eucalyptus brassiana</i>	Tree		X	X
<i>Eucalyptus tetradonta</i>	Tree	500	X	X
<i>Grevillea glauca</i>	Tree		X	
<i>Grevillea parallela</i>	Tree			X
<i>Livistonia muelleri</i>	Tree (palm)		X	
<i>Melaleuca stenostachya</i>	Tree		X	
<i>Melaleuca viridiflora</i>	Tree	50		
<i>Parinari nonda</i>	Tree	100	X	X
<i>Pandanus spiralis</i>	Tree		X	
<i>Persoonia falcata</i>	Tree	100		X
<i>Sersalisia unmackiana</i>	Tree	100		X
<i>Sterculia quadrifida</i>	Tree	100		X
<i>Syzygium eucalyptoides</i>	Tree		X	
<i>Syzygium suborbiculare</i>	Tree	750	X	X
<i>Timonius timon</i>	Tree		X	
<i>Xylomelum scottianum</i>	Tree			X
<i>Bridelia tomentosa</i>	Shrub			X
<i>Clerodendrum costatum</i>	Shrub		X	X
<i>Clerodendrum floribundum</i>	Shrub			X
<i>Coelospermum decipiens</i>	Shrub			X
<i>Coelospermum reticulatum</i>	Shrub	100	X	X
<i>Ficus opposita</i>	Shrub	200		X
<i>Grewia retusifolia</i>	Shrub	100		
<i>Litsea glutinosa</i>	Shrub	50		X
<i>Planchonia careya</i>	Shrub	100		X
<i>Aristida holathera</i>	Grass	120		
<i>Chrysopogon setifolius</i>	Grass		X	
<i>Eragrostis pubescens</i>	Grass	120		X
<i>Eriachne trisetia</i>	Grass	100	X	
<i>Heteropogon triticeus</i>	Grass	300		X

<i>Mnesithea rottboelioides</i>	Grass		X	
<i>Panicum seminudum</i> var. <i>cairnsianum</i>	Grass	300	X	X
<i>Pseudopogonatherum irritans</i>	Grass	100	X	X
<i>Sarga plumosum</i>	Grass	300		
<i>Setaria surgens</i>	Grass		X	
<i>Schizachyrium pachyarthron</i>	Grass	100		
<i>Thaumastochloa pubescens</i>	Grass	100	X	X
<i>Themeda arguens</i>	Grass	300		
<i>Vigna spp.</i>	Herb	50		
<i>Dioscorea bulbifera</i>	Vine	100		X

5.5 0.0 0.0

x indicates species known to occur within the RE type.

To be updated with final species and quantities within 12 months following further analogue surveys.

Seed will be spread by hand or using a single-compartment hopper combined with an agricultural tractor. The use of drone technology for seed / fertiliser application will also be investigated.

Watering will depend on wet-season rains. Seeding will likely take place at the onset of the wet season, typically in November or December, although this may be delayed depending on the weather patterns each year, to ensure adequate moisture for growth. All plants on site are adapted to germinate during the wet season and endure the subsequent dry season.

Indicators of success will be evaluated at the start of each dry season via quick check surveys (further discussed in Section 9). These assessments will refine the appropriate rehabilitation methodology for subsequent years, including the necessary topsoil depth and whether direct seeding is needed or if sufficient establishment is achieved through the seedbank.

Tube Stock Infill Planting

Tube stock will be grown in a local nursery (Weipa) for infill on sites diverging from the expected trajectory. Tube stock propagation will supplement areas or species where natural germination is less reliable, using native soil for long-term success.

6.9.6 Rehabilitation Trials

The implementation of rehabilitation trials is a requirement under the EA rehabilitation conditions (and a requirement of this PRCP). The objectives of the trials are to assess and enhance rehabilitation strategies while also testing the successes of the rehabilitation methods. Any rehabilitated areas that are unlikely to meet completion criteria and show worsening BioCondition Assessment scores must be revisited to improve performance.

The field trial is intended to test various rehabilitation techniques and treatments in real-world conditions. The objectives of the field trial include evaluating the effectiveness of different methods, monitoring species emergence and establishment, and making any necessary adjustments to improve rehabilitation outcomes. These trials will provide important insights into optimising rehabilitation practices applied at the UBxP.

Initial field trials are scheduled to begin once mining operations have commenced in Year 1. Rehabilitation field trials will begin in the first cleared panel (~1 ha).

The top 10 cm of topsoil is identified as containing the highest proportion of the seed bank (Rokich et al 2001), with the highest germination occurring from the top five centimetres for some vegetation types (Toth et al 2022). One of the objectives of the rehabilitation trial is to determine the ideal depth of the first cut of the top for rehabilitation success (**Figure 6-6**).

The use of scrapers to remove the topsoil allows for an accurate and consistent depth to be removed. Two separate first cuts will be collected during the stripping of the first block: 0 – 5 cm and 0 – 10 cm, to identify the optimum topsoil depth for seed bank germination.

The remaining top soil will also be collected in different ratio's and stockpiled separately for respread as indicated in **Figure 6-6** to determine whether topsoil below the first cut layer needs to be removed and stored separately for improved rehabilitation establishment.

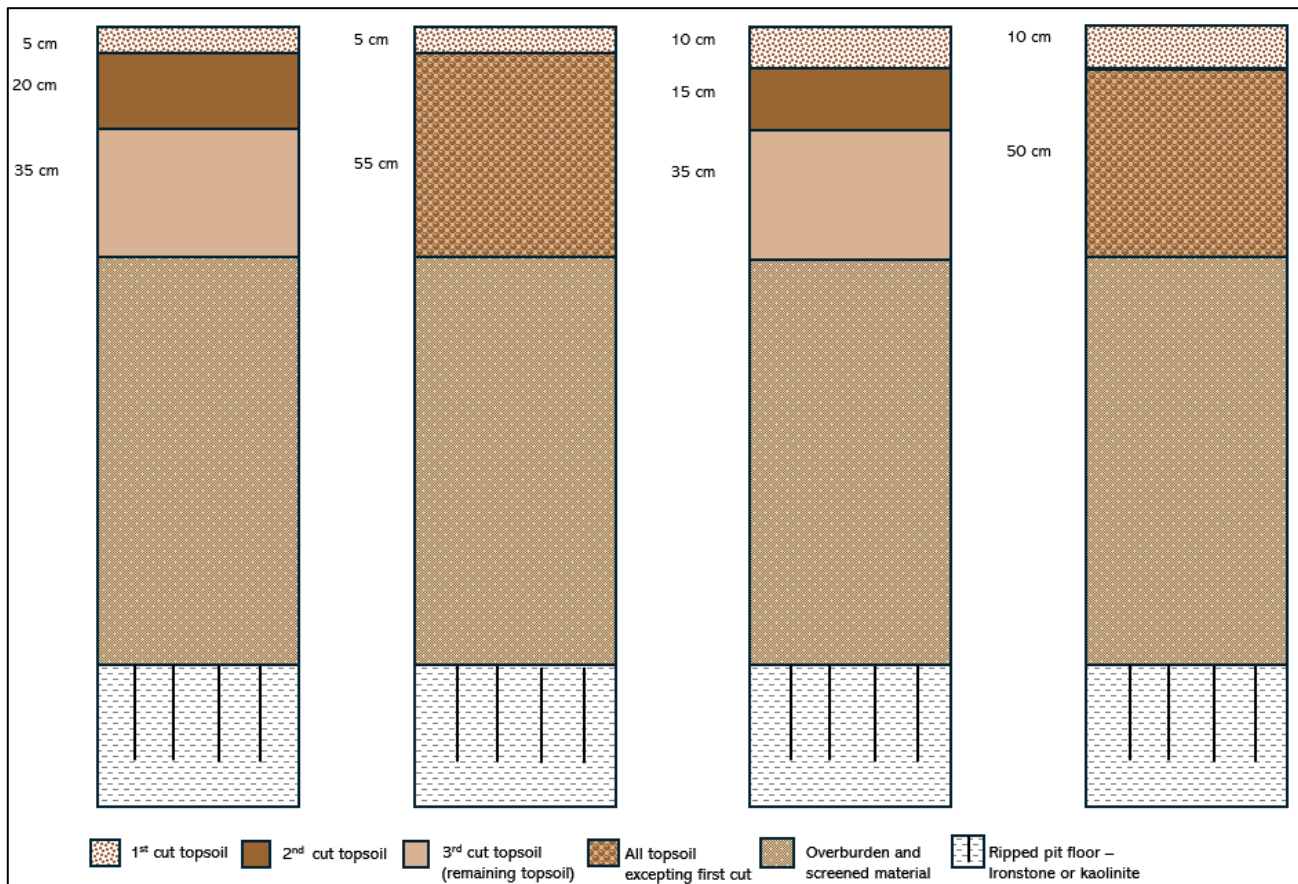


Figure 6-6 Rehabilitation trial soil distribution.

Twelve main treatments will be implemented across the block for the first rehabilitation trial. These treatments, as outlined in **Table 6-5** below, will occur in 30 m x 30 m plots.

Table 6-5 Field treatment combinations

10 cm topsoil mixed sub-topsoil no fertiliser no seed	10 cm topsoil mixed sub-topsoil fertiliser no seed	10 cm topsoil sub-topsoil separated fertiliser no seed	10 cm topsoil sub-topsoil separated no fertiliser no seed
10 cm topsoil mixed sub-topsoil no fertiliser seed	10 cm topsoil mixed sub-topsoil fertiliser seed	10 cm topsoil sub-topsoil separated fertiliser seed	10 cm topsoil sub-topsoil separated no fertiliser seed
5 cm topsoil sub-topsoil separated no fertiliser seed	5 cm topsoil sub-topsoil separated fertiliser seed	5 cm topsoil mixed sub-topsoil fertiliser seed	5 cm topsoil mixed sub-topsoil no fertiliser seed
5 cm topsoil sub-topsoil separated no fertiliser no seed	5 cm topsoil sub-topsoil separated fertiliser no seed	5 cm topsoil mixed sub-topsoil fertiliser no seed	5 cm topsoil mixed sub-topsoil no fertiliser no seed

Mulch will be applied by hand to each plot (four treatments) as illustrated within **Figure 6-7**.

Large logs, stockpiled from the initial clearing of the area, will be randomly placed across the site to determine if the microclimates created by the logs affect seed emergence.

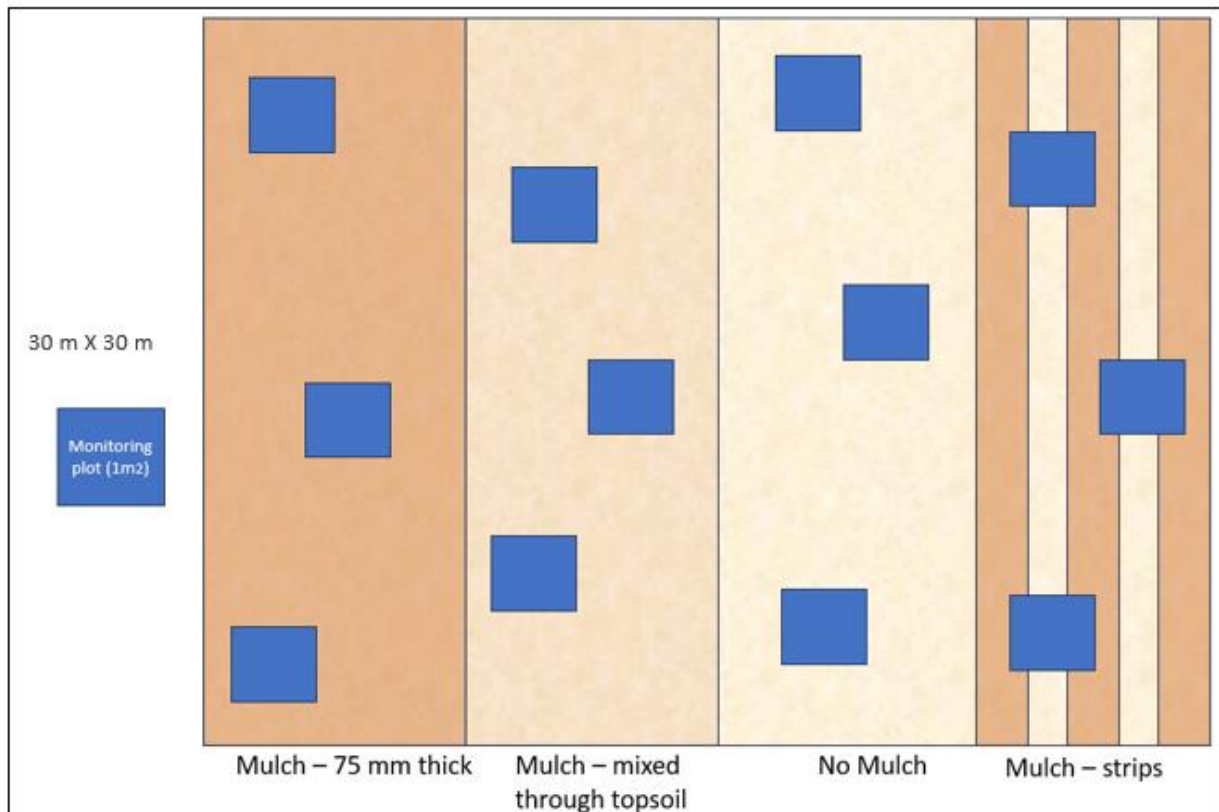


Figure 6-7 Monitoring plot example layout within each treatment

Monitoring will occur after the first wet season. Three 1m x 1m quadrats will be surveyed within each treatment, totalling 192 monitoring plots. Within each 1 m² monitoring plot the following elements will be recorded:

- the number of seedlings establishing;
- type (graminoid, weed, herb, woody veg, named to species where possible);
- ground cover percentage;
- observations on emergence patterns – such as whether different mulch treatments are enhancing or suppressing seedlings (native and weed species).
- Soil pH and EC will be recorded in the field (Distilled water of 100 ml will be added to a soil sample of 20 g from the middle of Horizon A to prepare 1:5 soil water suspension. The sample will be kept aside for a minimum of one hour and mixed thoroughly by shaking prior to reading with a multiparameter meter).

Erosion occurrence within the monitoring plots and across the wider plot for each treatment will be recorded.

Trial timing

Species grown from seeds collected on-site will begin in 2025 to determine if any seeds require specialised treatment to enhance germination. Initial plants grown will be used as tube stock for infill during the rehabilitation process.

The field trial will begin as soon as possible after the mining of Block 1 in Year 1, with seed spread timed to coincide with the start of the wet season to minimise seed predation and take advantage of optimal germination conditions.

Results from the field trial will be evaluated after the first wet season. Any sections of the trial that need remediation, such as erosion control, will be addressed immediately following this period. Infill with tube stock will be carried out at the start of the next wet season.

Trial assessment, results and implementation

Monitoring of the field trial block will take place before mining starts in the second year to ensure that future rehabilitation efforts follow the most effective methods, particularly in relation to topsoil removal depth and handling.

Two early establishment survey plots will be set up—one for the 5 cm depth treatment and one for the 10 cm depth treatment—to observe changes over time across all treatments. Success will be assessed based on the completion criteria outlined in **Section 5.1**.

The field trial treatments that show the highest emergence of desired species and the greatest stability, particularly in terms of erosion control, will guide the rehabilitation program for the second year. Results from the rehabilitation trial survey will be analysed before mining starts in the second year to ensure that best practices are applied to rehabilitation areas that year.

Milestones for the trials have been established in advance and are unlikely to change for Area A, however should the full mining program take place, these may be reviewed by appropriately experienced ecologists prior to commencement of Area B.

The trials aim to enhance rehabilitation practices observed at northern Australian mine sites, and reflect similar trials being proposed by Cape Commodities Pty Ltd at the neighbouring Urquhart Mineral Sands Project.

6.10 Tailings Storage Facilities

The bauxite on site has been identified as Direct Shipping quality so limited processing will be occurring on site beyond initial screening to remove vegetation, oversize and undersized material within the ore. Dry tailings from screening waste will be placed back into the mine pit during the progressive rehabilitation process, prior to the return of the overburden, land shaping, and topsoil and mulch application, thus no tailings storing facilities are proposed for the UBxP.

6.11 Underground Mining

No underground mining is planned for the UBxP.

7 Surrender of the Environmental Authority

A surrender application must adhere to the requirements specified in Section 262 of the EP Act. This application must include a final rehabilitation report, a post-mining management report, and a compliance statement for the EA and PRC Plan schedule.

The final rehabilitation report should include an environmental risk assessment and details of any proposed costs related to residual risks remaining at the site. The environmental risk assessment must follow a methodology agreed upon by the administering authority. This assessment is crucial for calculating any residual risk costs for the site, which may involve evaluating the present value of future repair costs, necessary monitoring and maintenance expenses, and ongoing management costs for rehabilitated land.

A payment is required as a pre-condition for the surrender of an EA. This payment allows the government to address residual risks associated with the site upon surrender. These residual risks may involve potential failures of rehabilitation works and engineered structures, as well as ongoing costs for monitoring and maintenance after surrender.

The residual risk framework does not alter or diminish the obligations of an EA holder to complete rehabilitation to the required standards. Instead, it enables companies to relinquish their tenure and surrender an EA while ensuring that the State is informed of any remaining risks and is equipped to manage them, including addressing potential financial consequences of future environmental harm.

8 Risk Assessment

In accordance with section 126C(1)(f) of the EP Act, a risk assessment identifying potential risks of a stable condition for land not being achieved has been undertaken.

Potential environmental risks of not achieving the rehabilitation milestones have been assessed and current and additional risk control measures identified. The residual risk after controls has been assessed according to the criteria presented in **Table 8-1** to **Table 8-3**.

Risk assessment outcomes are provided in **Table 8-4**.

Table 8-1 Likelihood Measures

Rating	Description
Almost Certain (AC)	The event is expected to occur in most circumstances
Likely (L)	The event will probably occur in most circumstances
Possible (P)	The event should occur at some time
Unlikely (U)	The event could occur at some time
Rare (R)	The event may only occur in exceptional circumstances

Table 8-2 Consequence Measures

Rating	Health	Financial Impact	Environment
Insignificant (I)	Minor injuries not requiring first aid or near miss. No psychological stress	Less than \$10,000	Contained, reversible impact managed by on site response
Minor (Mi)	First Aid treatment and/or one-off counselling	\$10,000 to \$100,000	Contained, reversible impact managed by internal response
Moderate (Mo)	Medical treatment required and/or psychological intervention/ treatment required	\$100,000 to \$1,000,000	Contained, reversible impact managed by external agencies
Major (Ma)	Serious or extensive injuries and/or significant and long-term psychological stress	\$1,000,000 to \$10,000,000	Uncontained, external reversible impact managed by a coordinated response from external agencies
Catastrophic (C)	Death or severe permanent physical and/or psychological disablements	Greater than \$10,000,000	Uncontained, irreversible impact

Table 8-3 Risk Matrix

Likelihood of risk	Consequence of risk				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Moderate	High	High	High	Extreme
Likely	Low	Moderate	High	High	High
Possible	Low	Moderate	Moderate	High	High
Unlikely	Low	Low	Moderate	Moderate	High
Rare	Low	Low	Low	Low	Moderate

Table 8-4 Risk Assessment

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
RM1 - Infrastructure decommissioning and removal	Schedule for infrastructure decommissioning and removal inadequately communicated among management and work teams.	- Failure to remove all infrastructure in accordance with the PRC Plan Schedule. - Achievement of milestone 1 delayed.	U	Mo	M	- Infrastructure decommission schedule to be incorporated into annual mine planning. - Monthly progress meetings are to take place between management (i.e., responsible personnel) and work crews regarding infrastructure decommissioning and removal. - A register of infrastructure is to track which structures exist in each rehabilitation area and which have been removed.	The proposed actions will allow the early identification of potential deviations from the PRC Plan Schedule, affording ample opportunity to adjust work rates to ensure that scheduled works are completed by the reporting date of 10 December.	Adequate time allocated for planning and progress meetings.	Refer Section 5.1	Refer to Section 9.1	R	Mo	L
	Infrastructure decommissioning and removal takes longer than planned.	Achievement of milestone 1 delayed.	U	Mi	L	- Monthly progress meetings are to take place between management (i.e., responsible personnel) and work crews regarding infrastructure decommissioning and removal. - Additional work team resourcing may be sought in the event that the completion of scheduled works is otherwise unlikely by the annual reporting date.	The proposed actions will allow the early identification of potential deviations from the PRC Plan Schedule, affording ample opportunity to adjust work rates to ensure that scheduled works are completed by the reporting date of 10 December.	Adequate time allocated for planning and progress meetings; funding for supplementary contractors, if required.			R	Mi	L
RM2 – Remediation of contaminated land.	Site contamination from Fuel storage, service area and plant (including HME).	- Achievement of milestone 2 delayed. - Financial cost of remediation.	U	Mo	M	- All personnel will receive training on appropriate action to take in the event of a spill. - Faulty or leaking plant will be removed from service until repaired to contain contamination to workshop areas. - Hydrocarbons are stored in self-bunded, above ground tanks spill kits located in proximity to fuelling areas. - Lubricants and waste oil are stored in a self-bunded dangerous goods storage shed. - Monitoring of groundwater is undertaken to confirm quality of water in respect to possible contamination.	A response procedure will aim to prevent further contamination until appropriate training and processes will be implemented to prevent future contamination	Adequate procedures and training	Refer Section 5.1	Refer to Section 9.1	R	Mo	L

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
	Remediation work not completed to schedule.	Achievement of milestone 2 delayed, stalling later phases of rehabilitation.	U	Mo	M	- Decontamination works are to be incorporated into annual mine planning. - Monthly progress meetings are to take place between management (i.e., responsible personnel) and work crews regarding de-contamination works - Compliance with the PRC Plan schedule is to be overseen by responsible personnel.	Decontamination works must be completed to allow sufficient time for milestones 3 and 4 to be accomplished, or milestone 5 will be delayed by an additional year.	Adequate time allocated for planning and progress meetings.			R	Mo	L
	Previously unidentified contamination source discovered.	- Achievement of milestone 2 delayed. - Financial cost of remediation.	U	Mo	M	- Records are to be kept of all spills, leaks and other incidents occurring at the Project that might result in contamination. These incidents are to be recorded in an Incident Register, and information about relevant incidents are to be provided to an approved auditor prior to their site visit/testing. - Employees and contractors are to be made aware of their reporting obligations through a Site Induction. - Initial consultation with an approved auditor to identify contamination targets for remediation or removal.	To be suitable for a PMLU, contaminated land must be removed from the Contaminated Land Register or the Environmental Management Register, and declared suitable for any use. These works must be approved by a suitably qualified person and an approved auditor (under the Environmental Protection Act 1999 Act).	Adequate time per shift for reporting; funding for audits.			R	Mo	L
RM3 -Landform Development and Reshaping/Reprofiling	Heavy rain prior to surface preparation and revegetation (milestones 4 and 5).	Sedimentation of receiving waters.	L	Mo	H	- Monitoring for erosion following rainfall events and applying corrective action where necessary. - Follow the Sediment and Erosion Control Management Plan. - Appropriate erosion and sediment controls will be established where required in existing disturbance areas. - Water quality monitoring program will continue to be implemented. - Slope designed with shallow gradient. - All earthworks except topsoil handling and placement are complete. - Earthworks timed to coincide with dry-season. - Sediment management systems to be operational during construction of final landform (ESCP)	- Heavy downpours are unlikely between the months of June and October. - Sediment management systems trap eroded material	The sediment management system has been already designed for the planning and approval stages of the Mine. Appropriate time and personnel are required for construction of this system.	Refer Section 5.1	Refer to Section 9.1	U	Mo	M

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
							before it can enter local waterways. This system has been designed in accordance with the Best Practice Erosion and Sediment Control (IECA, 2008) guidelines.						
	Timing and design specifications for final landform not adequately implemented.	- Achievement of milestone 3 delayed. - Reduced safety and/or stability of final landform.	U	Mo	M	- Annual audits are to confirm agreement between as-constructed landforms and approved designs. - Monthly progress meetings are to take place between management (i.e., responsible personnel) and work crews regarding landform construction. - The final landform surveyed and certified by a suitably qualified person as per the construction designs; and - Rehabilitation areas have 'as-constructed' reports prepared.	Early detection of inconsistencies between constructed landforms and approved designs will allow adequate opportunity for modifications to be completed by the reporting date of 10 December.	Adequate time allocated for planning and progress meetings; funding for auditors.			R	Mi	L
RM4 - Surface preparation	Inappropriate topsoil and subsoil management whilst stockpiled	- Reduced viability of topsoil, limiting plant establishment at rehabilitated sites. - Topsoil infested with weed propagules, which will invade rehabilitated sites.	L	Ma	H	- Determine topsoil stripping depths to maximise respread across the site - There is sufficient topsoil present on site to allow for 40 - 50 cm respread across rehabilitated areas. - Topsoil stockpiles will be kept no more than 2 m high to maintain physical and biological quality. - Any erosion or subsidence that occurs after the achievement of RM3 has been remediated prior to topsoil application; - Spatial segregation of topsoil and subsoil, with signage installed at each stockpile to denote soil type. - An assessment of soil health and suitability has been completed by an appropriately qualified person to confirm soil is suitable for target vegetation establishment; - Any fertilisers/ameliorants recommended as a result of the soil assessment have been applied at the rate recommended by the appropriately qualified person; and - Topsoil stockpiles to be managed in strict accordance with practices described in Section 6.9.5.	By minimising stockpile heights, preventing the mixing of subsoils and topsoil, maintaining a vegetative cover on stockpiles and controlling weed populations on stockpiles before they become dominant, soil health will be maintained.	Adequate signage, herbicides and personnel are required.	Refer Section 5.1	Refer to Section 9.1	U	Mo	M

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
	Inadequate topsoil cover.	- Exposure of dispersive subsoils to rain. - Gully erosion. - Cost of repeating landform reshaping and surface preparation.	P	M	M	- Rapidly establishing grasses to be included in seed-mixes. - Sediment management systems to be operational during surface preparation and revegetation (as per ESCP). - There is sufficient topsoil present on site to allow for 40 - 50 cm respread across rehabilitated areas. - An assessment of soil health and suitability has been completed by an appropriately qualified person to confirm soil is suitable for target vegetation establishment.	Use of AQP to ensure soil quantity and health is sufficient	Use of AQP to ensure soil quantity and health is sufficient			U	Mo	M
	Vehicles contaminated with weed seeds used for earthworks.	Weeds invading rehabilitated sites, inhibiting the establishment of desirable species and preventing achievement of milestones 6, 7 and 8.	L	Ma	H	- Strict vehicle wash-down practices for vehicles entering the site from contaminated areas. - Annual weed monitoring program, to allow the early detection and treatment of new weed infestations.	Prevention of introduction and early treatment of new infestations are central to the successful and cost-effective management of weeds on site.	Adequate time and budget for wash-downs, monitoring and weed control.			U	Mo	M
	Heavy rainfall occurring prior to establishment of vegetative cover.	- Loss of topsoil from slopes. - Siltation of downstream waterways. - Failure of vegetation to establish on eroded surfaces. - Cost of reapplying topsoil to eroded surfaces.	L	Mo	H	- Low slope gradient in landform design to limit capacity for sediment loss. - Surface preparation immediately prior to seeding to limit time that bare slopes are exposed to rain events. - Rapidly establishing grasses to be included in seed-mixes. - Sediment management systems to be operational during surface preparation and revegetation (as per ESCP)	Strategically revegetating when the weather forecast does not expect rain as well as employing rapidly establishing grasses will prevent revegetation failure.	Seed for pioneer grasses; appropriate time and personnel are required for construction of the sediment management system and final landform according to designs.	Refer Section 5.1	Refer to Section 9.1	U	Mo	M

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
RM5 - Revegetation	Seed unavailable.	Lack of seed of certain species can lead to long-term effects on the composition of the eventual plant communities that establish.	U	Mo	M	- Seed collection and procurement is to commence at the start of the Mine, so that supplies are available when revegetation begins. - A store of seed is to be maintained on site. - Woody species unavailable at the time of sowing are to be added to rehabilitated sites as tubestock in the following wet season.	Collecting over two years prior to revegetation allows for certain species to seed poorly in any one year.	Funding for seed collection/purchase must be available from the start of the Mine.	Refer Section 5.1	Refer to Section 9.1	R	Mo	L
	Heavy rain immediately after sowing.	- Loss of topsoil from slopes. - Siltation of downstream waterways. - Failure of vegetation to establish on eroded surfaces. - Cost of reapplying topsoil to eroded surfaces.	L	Mo	H	- Low slope gradient in landform designs to limit capacity for sediment loss. - Surface preparation and sowing is not to take place if heavy rain (>40 mm) is forecast over any one day within the next fortnight. - Rapidly establishing grasses to be included in seed-mixes. - Sediment management systems to be operational during surface preparation and revegetation (as per ESCP).	Strategically revegetating when the weather forecast does not expect rain as well as employing rapidly establishing grasses will prevent revegetation failure.	Rapidly establishing grasses in seed mix	Refer Section 5.1	Refer to Section 9.1	U	Mo	M
	Inappropriate quantity of grass seed used in the seed mix.	- Tree and shrub establishment inhibited by high grass cover. - Insufficient protective cover of grass increasing the risk of erosion.	U	Mo	M	- Seed mixes have been based on pre mining species - Grass seed application rates are to be modified pending the outcome of the initial rounds of rehabilitation. - In sites with excessive grass densities, tube stock of trees and shrubs are to be planted within circles (1 m radius) of grass that have been killed using herbicide. - In sites with insufficient grass cover, there is to be supplementary sowing and/or fertilising in bare patches to encourage grass growth. - Seeding has been completed at a rate of 5.49 kg/ha using seed mixes.	Establishing treatment early on increases the chance of plant establishment success	Adequate time for reviewing the revegetation methodology on an annual basis.	Refer Section 5.1	Refer to Section 9.1	R	Mo	L
	Inappropriate quantity of tree and shrub seed used in the seed mix.	Insufficient or excessive canopy cover can cause the eventual	U	Mo	M	- Seed application rates are to be modified pending the outcome of the initial rounds of rehabilitation. - Supplementary planting of tube stock or thinning of established seedlings may be required to correct for inappropriate tree densities. - Seeding has been completed at a rate of 5.49 kg/ha using seed mixes	Early identification of issues and amendments of seed mixes will reduce overall	Adequate time for reviewing the revegetation methodology on an annual basis.	Refer Section 5.1	Refer to Section 9.1	R	Mo	L

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
		vegetative communities to fail to achieve milestones 6 and 7.					costs associated with remediating.						
	Vehicles and/or footwear contaminated with weed seeds	Weeds invading rehabilitated sites, inhibiting the establishment of desirable species and preventing achievement of milestones 6 and 7.	U	Mo	M	- Strict vehicle wash-down practices for vehicles entering the site from contaminated areas. - Annual weed monitoring program as part of the yearly rehabilitation monitoring surveys, to allow the early detection and treatment of new weed infestations.	Prevention of introduction and early treatment of new infestations are central to the successful and cost-effective management of weeds on site.	Adequate time and budget for wash-downs, monitoring and weed control.	Refer Section 5.1	Refer to Section 9.1	U	Mi	L
RM6 – Establishment of target vegetation	Poor development of threatened species food trees and culturally significant species	- Insufficient density of food trees to allow use of rehabilitated areas by the threatened species - Failure to achieve targets of completion criteria. - Failure to achieve BioCondition targets	U	Mo	M	- Seed mixes have been based on other mine sites across north-eastern Australia. - Seed application rates are to be modified pending the outcome of the initial rounds of rehabilitation. - Regular monitoring aims for the early detection of sites with inadequate seedling establishment. - Sites with insufficient density of food trees developing over the first two years will undergo supplementary planting of tube stock.	Early refinements of the seed mixes will reduce the need for later interventions. Tube stock is a superior method for adding trees to existing pastures, as tree seeds often fail to germinate/establish among competitive understorey species.	Adequate time for reviewing the revegetation methodology on an annual basis; a nursery facility to rear tube stock OR contracts with commercial nurseries to rear stock.	Refer Section 5.1	Refer to Section 9.1	U	Mi	L
	Insufficient density of trees and shrubs	- Habitat is unsuitable for species - Failure to achieve	P	Ma	H	- Seed mixes have been based on other mine sites across northern Australia. - Seed application rates are to be modified pending the outcome of the initial rounds of rehabilitation. - Regular monitoring aims for the early detection of sites with inadequate seedling establishment.	Early refinements of the seed mixes will reduce the need for later interventions.	Adequate time for reviewing the revegetation methodology on an annual basis; a	Refer Section 5.1	Refer to Section 9.1	U	Mi	L

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
		targets of rehabilitation completion criteria.				Sites with insufficient density of trees and shrubs developing over the first two years will undergo supplementary planting of tube stock.	Tube stock is a superior method for adding trees to existing pastures, as tree seeds often fail to germinate/establish among competitive understorey species.	nursery facility to rear tube stock OR contracts with commercial nurseries to rear stock.					
	Weeds	- Weeds could invade via wind, vehicles or footwear during vegetation development. - Weeds can inhibit the establishment of desirable species and preventing achievement of milestones 6 and 7.	U	Mo	M	- Strict vehicle wash-down practices for vehicles entering the site from contaminated areas. - Annual weed monitoring program, to allow the early detection and treatment of new weed infestations.	Prevention of introduction and early treatment of new infestations are central to the successful and cost-effective management of weeds on site. Weed risk is highest during topsoil stockpiling, surface preparation and planting, rather than during the development of the vegetation communities post-planting. However, weed management practices are to remain in place throughout the duration of rehabilitation.	Adequate time and budget for wash-downs, monitoring and weed control.	Refer Section 5.1	Refer to Section 9.1	U	Mi	L
	Fire	A fire during early stages of vegetation establishment could kill developing	U	Mo	M	- A fire break will be maintained along the Rio Tinto lease boundary - A Fire management plan describes processes in place to control fires that originate on site.	Appropriate fire measures will help prevent irreparable damage to revegetation	- Personnel and machinery required to build and maintain fire breaks. - Fire safety training	Refer Section 5.1	Refer to Section 9.1	R	Mo	L

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
		trees and shrubs prior to their establishment, leading to a failure to achieve rehabilitation completion criteria pertaining to tree cover.											
RM7 - Achievement of post-mining land use to stable condition	Poor landscape stability	- Failure of sites to develop adequate sediment and leaf litter capture by groundcover features. - Formation of a dysfunctional landscape that results in a loss of resources (nutrients, water, sediment) over the long term. - Failure to achieve rehabilitation completion criteria pertaining to land stability.	U	M	M	- Low slope gradient in landform design to limit capacity for sediment loss. - Inclusion of a diversity of grass, trees and shrubs in seed mixes. - Topsoil storage and handling are to be in accordance with practices described in Section 6.74.	Landscape function analysis is a widely implemented framework for managing and monitoring landscape stability.	Personnel/contractors required for regular monitoring; adequate time for reviewing the revegetation methodology on an annual basis; additional seed stocks and fertiliser, as required.	Refer Section 5.1	Refer to Section 9.1	U	Mi	L

Milestone	Hazard / Risk	Impact	Risk Classification			Proposed controls or actions	Justification of treatment options	Resource requirements	Performance measures	Reporting and monitoring	Residual Risk Classification		
			Likelihood	Consequence	Classification						Likelihood	Consequence	Classification
	Significant erosion of placed soils on final landform	- Failure to establish vegetative cover and therefore stable PMLU - Loss of topsoil - Loss of sediment control structure performance - Water quality impacts	L	Mo	H	- Low slope gradient in landform design to limit capacity for sediment loss. - Surface preparation and sowing is not to take place if heavy rain (>40 mm) is forecast over any one day within the next fortnight. - Rapidly establishing grasses to be included in seed-mixes. - Sediment management systems to be operational during surface preparation and revegetation (as per ESCP). - Amelioration measures to assist with soil retention, including addition of: - fertiliser; and - organic mulch.	Further amelioration measures are provided to enhance early establishment of vegetation and to support a sustainable and productive vegetative cover.	personnel are required for construction of the sediment management system and final landform according to designs.	Refer Section 5.1	Refer to Section 9.1	U	Mi	L

9 Monitoring and Reporting

The overarching rehabilitation goal for the UBxP is to establish self-sustaining native vegetation which resembles the pre-mining land use and surrounding areas. To ensure that rehabilitation activities at the UBxP are on-track to achieve this, reference sites for each RE type to be returned to rehabilitated areas at UBxP have been selected from adjacent areas that will remain undisturbed during mining operations. Reference (analogue) sites reflect a vegetation community structure and species mix that would constitute successful rehabilitation.

The data collected from reference sites was used as a basis for describing the flora species and vegetation units present within the UBxP area prior to mining. Data collected during the secondary analogue surveys was used to develop site specific BioCondition benchmark scores (**Table 9-5**) and will be utilised to track the progress of rehabilitated areas.

The proposed monitoring systems are provided in **Table 9-1** and includes high-level details regarding the monitoring schedules and frequencies of each monitoring system.

Table 9-1 Monitoring schedule and frequency

Monitoring type	When monitoring should be initiated	Preferred time of year	Frequency and duration
Analogue surveys	Prior to clearing	Between April and June	At least once prior to commencement of RM5
Quick Check	In the year after revegetation has been undertaken	Between April and June	Once per block (RM6)
Early Assessment	In year two post seeding	Between April and June	Once per block (RM6)
Performance Monitoring	At least three years post seeding (to assess closure criteria and suitability for relinquishment)	Between April and June	EA states 1:15 000 ha, but every block will be re-monitored (RM7)
Erosion, stability and ponding	In the year after revegetation has been undertaken	Between April and June	Annually during RM6 until RM7 achieved
Photo monitoring (native vegetation)	Prior to clearing	March, June, September November	Quarterly until completion of RM7
Photo monitoring (rehabilitation areas)	Prior to clearing	Between April and June, but the same time every year.	Yearly until completion of RM7
Groundwater quality	Prior to clearing	March, June, September November	Quarterly until completion of RM7
Surface water quality (including wetland in RA4).	Prior to clearing	March, June, September November	Following unauthorised release of contaminants until completion of RM7

At the completion of rehabilitation establishment, monitoring will be undertaken to assess early establishment trajectory and, if required, the need for remedial action.

1. Undertake a “quick check” of vegetation emerging after the first wet season of rehabilitation at each panel of rehabilitation. This will allow for the identification of emerging species and whether the mulch layer is interfering with emergence. Weed species emergence and dominance can also be ascertained and treated (there are few identified weed species on site and weeds are unlikely to be an issue).
2. At year two (early assessment), a 50 m by 10 m plot will be surveyed (following adapted herbarium guidelines for secondary survey), to measure species composition and density, percentage ground cover, evidence of erosion, evidence of fauna uses and weed density. As the majority of clearing is within the same RE type, a representative sample (1:10 ha) will be surveyed to identify whether rehabilitation is following preferred trajectories. Should anomalies be detected, more intensive monitoring will be undertaken to establish where, and why, shortfalls are occurring. Emerging vegetation communities will be compared with analogue sites for the same vegetation type to inform management requirements, such as species requiring infill from tube stock. Proposed analogue reference sites will be chosen to best reflect the existing vegetation on the sites to be cleared.
3. In addition to monitoring plots, photographic monitoring points will be installed within a subset of rehabilitated areas and within surrounding remnant vegetation. Photopoints will be captured prior to clearing and photographed annually, post-rehabilitation, to document the developing vegetation community. Photos will be kept for each monitoring occasion as a permanent visual record of the development of rehabilitation. Photo points will be photographed quarterly within remnant vegetation to provide evidence of general health of the vegetation on site throughout the life of the mine. Photo monitoring points will be installed in the native vegetation prior to the commencement of mining to provide a baseline of community health. Photo monitoring points will target areas that have the potential to be impacted by the mining disturbance, to document health throughout the life of the mine.
4. Any ongoing maintenance required, such as weed control or infill with tube stock, will be determined following rehabilitation monitoring (both quick check and early assessment surveys). Tube stock will be planted at the start of the wet season. Weed maintenance will commence at the start of the dry season and be ongoing throughout the active season.

The site will be inspected for signs of active erosion and the development of rills and gullies, following the first wet season of reshaping, and as part of the rehabilitation vegetation monitoring program. Sites will be inspected as a wandering transect with the observer meandering with full width of the rehabilitation area across the slope of rehabilitation areas. The rehabilitation areas of particular interest for visual monitoring will be the steeper re-contoured ridges installed to replicate the pre-clearing topography. This will help ascertain whether the designs continue to perform to an acceptable measure. Active erosion will be noted as defined in the Australian Soil and Land Survey Field Handbook 4th Edition (the National Committee on Soil and Terrain, 2024) Areas of slumping or showing evidence of ponding (>10 m²) will also be identified. Active erosion features, slumping and ponded areas will be photographed and logged with a GPS for repairs as required.

9.1 Milestone Monitoring

The purpose of the milestone monitoring program is to demonstrate the rehabilitation milestones and milestone criteria have been achieved. The monitoring to be carried out for the UBxP is described in **Table 9-2**. The milestone criteria applicable to each rehabilitation milestone is outlined in Section 10, with these criteria are also provided in the Rehabilitation Management Plan (**Appendix E**). Further detail on rehabilitation monitoring is detailed in **Appendix E**.

Table 9-2 Monitoring and maintenance schedule for the UBxP

Criteria	Monitoring and Maintenance	Frequency / Timing	Quality Assurance and Data Management	Evidence, Reporting and Review
RM1 - Infrastructure decommissioning and removal				
All project infrastructure (buildings, plant) and wastes removed from site for repurposing, recycling or disposal at an appropriately licensed facility.	Confirm by visual inspection the following as decommissioned and removed: • Services; • Road materials; • Pipelines; • Buildings and foundations; • Machinery and equipment; • Scrap; and • General and regulated waste. Infrastructure has been reused/disposed of in accordance with best practice at appropriate off-site facilities.	Once after rehabilitation area has been cleared.	• Decommissioning, demolition and removal works will be conducted by appropriately qualified work crews. • Checklists will be kept in document control system.	• Site inspection and checklist record. • Receipts from recycling/waste disposal locations accepting infrastructure etc.
All exploration drill holes, and monitoring bores rehabilitated in accordance with the applicable Australian Standard or guideline.	Confirm by visual inspection and audit of records that all exploration drill holes and monitoring bores (where not needed post mine closure): • Are decommissioned; • Have had unused drill chips disposed to the bore hole or sump; • Are capped at a depth suitable for grazing activities or any future use of the land stipulated by the landholder (at least 300 mm below ground surface); and • Are backfilled to ground level.	As soon as practical after each exploration bore is no longer required.	Records of exploration drilling and rehabilitation of drill sites will be kept in the document control system.	• Inspection record sheets. • Rehabilitation records.
All aquifers isolated where exploration drill holes or monitoring bores have intersected more than one water bearing strata, in	Report against requirements of the 'Minimum Construction Requirements for Water Bores in Australia'.	Prior to relinquishing the mining tenure.	Reporting will be signed off by an AQP.	Report to be reviewed by Site Manager.

Criteria	Monitoring and Maintenance	Frequency / Timing	Quality Assurance and Data Management	Evidence, Reporting and Review
accordance with the 'Minimum Construction Requirements for Water Bores in Australia' (Australian Government, 2020) or latest edition.				
Risk assessment documents identified potential risks and controls/mitigation measures successfully implemented post closure in accordance with relevant guidelines and Australian Standards such as ISO31000 Risk Management.	Audit implementation of risk controls contained within the risk assessment conducted for the PRC Plan.	Once at mine closure.	Audit will be carried out by a person with appropriate experience in auditing risk assessments.	Audit report.
Rehabilitation Milestone 2 – Remediation of contaminated land				
Contaminated land assessment completed by a suitably qualified person and certified by an approved auditor.	Report	Once at mine closure.	Assessment to be carried out by a AQP.	Audit report
Remediation of contaminated soil.	Contaminated soil removed from site or remediated through use of soil additives.	Once at mine closure.	- Records kept of quantity of contaminated soil removed. - Types of remediation applied to soil, and location of remediation area.	- Reporting of works. - Inspection by site manager.
SQP Declaration	Declaration	Once at mine closure.	A declaration from the SQP who completed the contaminated land assessment stating that hazardous or unsuitable contaminated materials have been removed from the site	Signed declaration

Criteria	Monitoring and Maintenance	Frequency / Timing	Quality Assurance and Data Management	Evidence, Reporting and Review
Rehabilitation Milestone 3 - Landform Development and Reshaping/Reprofiling				
Major earthworks completed in accordance with design specifications for a final stable landform provided by a suitably qualified person.	- Regular visual inspections during construction; - Visual inspection by AQP following completion; and - Rehabilitation monitoring (erosion detection).	During rehabilitation activity and immediately following completion of milestone.	- Review will be carried out by third party who is also an APQ. - Live registers kept within document control system throughout all stages of the project.	- Registers. - Confirmation reports.
Natural flow paths reinstated. Where necessary, erosion and sediment control structures to be installed, fit for purpose and designed by a suitably qualified person.				
Infrastructure area and tracks ripped and shaped to conform to surrounding areas.				
Backfilled pits assessed for stability before commencing RM4.				
Rehabilitation Milestone 4 – Surface Preparation				
Surface roughness, infiltration capacity, aggregate stability and surface condition as defined in the Australian Soil and Land Survey Handbook are capable of sustaining the identified post closure land use.	Determine the characteristics of the final surface soils as defined in Australian Soil and Land Survey Handbook.	Once in each rehabilitation area following completion of surface preparation.	Field surveys will be conducted in accordance with applicable Australian Standards and QA methodology.	Inspection by an AQP in accordance with the Australian Soil and Land Survey Handbook.
Topsoil has been managed according to the requirements of the environmental authority and the Rehabilitation Management Plan.	- Conduct regular audits of the Rehabilitation Management Plan required by the environmental authority to confirm the operational controls have been implemented and monitored appropriately; and - Where necessary, develop and implement corrective actions to improve seedbed preparation for revegetation.	As required by Rehabilitation Management Plan.	Records of visual inspections kept in document control system.	- Records of visual inspections and audit reports. - Record of topsoil source, time of stockpiling (date of stockpile, date of respread) depth of

Criteria	Monitoring and Maintenance	Frequency / Timing	Quality Assurance and Data Management	Evidence, Reporting and Review
				spread - Operator to record in topsoil management database. Review and revise surface preparation techniques after each pit.
Any significant erosion (>0.5 m), that occurs after the achievement of RM3, has been remediated prior to topsoil application	An assessment of the final shaped landform, prior to topsoil application, will be undertaken to determine	Once in each rehabilitation area following completion of surface preparation.	Live registers kept within document control system throughout all stages of the project.	Registers.
Prior to topsoil application, an assessment of the need for soil amelioration has been undertaken and soil ameliorants such as fertiliser, gypsum and/or organic matter have been applied at appropriate rates.	- Regular visual inspections during rehabilitation; - Visual inspection by AQP following completion; and - Rehabilitation monitoring (erosion detection).	As required by Rehabilitation Management Plan.	- Review will be carried out by third party who is also an APQ. - Live registers kept within document control system throughout all stages of the project.	- Registers. - Confirmation reports.
Rehabilitation Milestone 5 – Revegetation				
Direct seeding from site collected seed.	Rehabilitation monitoring regime include: - Quick check assessment (6-9 months); - Early assessment (18 months); - Interim assessment (3 years); and - Performance monitoring (5 years +).	Rehabilitation reports – - Quick check assessment (6-9 months); - Early assessment (18 months); - Interim assessment (year 3); and	Appropriately qualified person(s) to undertake revegetation monitoring.	Results will be assessed against closure criteria to determine whether management intervention is required - reviewed and actioned within 2 months of report.
Planting of tube stock in sites requiring specific species not emerging from direct seeding.				
Weed presence is no greater than reference sites				
Grass cover is adequate to meet reference site requirements.				

Criteria	Monitoring and Maintenance	Frequency / Timing	Quality Assurance and Data Management	Evidence, Reporting and Review
Vegetation comprises of species composition comparable to the pre-disturbance RE.		Performance monitoring (year 5+).		
No significant (>0.5 m) active rill or gully erosion present.				
Rehabilitation Milestone 6 – Achievement of surface requirements				
Vegetation type and density are of species suited to the site’s characteristics including soil type, topography and climate.	- Conduct field surveys to monitor vegetation type and densities, and to confirm self-sustaining revegetation is occurring (evidence of flowering, viable seed setting, germination and emergence). - Record health of revegetation with photos. - Identify species and abundance of weeds and pests. - Undertake field monitoring after significant natural events such as bushfire, cyclone or drought. - Where necessary, develop and implement corrective actions to meet criteria, such as retreating topsoil, and resowing an amended seed mix.	- Quick check assessment (6-9 months); and - Early assessment (18 months). - Interim Assessment (3 year); and - Performance monitoring (year 5+)	Monitoring by appropriately qualified person(s) to record progress and track against reference sites (BioCondition scores Table 9.5).	- Records of assessment reports. - Annual PRCP reporting
Species in rehabilitated areas show evidence of germination and emergence and are expected to continue to do so.				
Vegetation in rehabilitated areas showing similar species structure to analogue (>75% similarity to species richness, diversity and density).				
The presence of weeds and pest species is no greater than the prevalence on the reference sites.				
Minimal gully erosion present across rehabilitated areas.				
Rehabilitation Milestone 7 – Achievement of stable PMLU (native ecosystems)				
Assessment by an AQP confirms developing vegetation community is			Monitoring by appropriately qualified person(s) to record	Rehabilitation reports –

Criteria	Monitoring and Maintenance	Frequency / Timing	Quality Assurance and Data Management	Evidence, Reporting and Review
on a trajectory to sustain the PMLU and is comparable to analogue sites.	- Visual inspection following completion to ensure there is no erosion or slumping. - Rehabilitation monitoring- performance monitoring to access vegetation trajectory, photo monitoring to show post mining condition similar to pre-mining vegetation condition.	Ongoing and upon completion of rehabilitation.	progress and track against reference sites.	- performance monitoring (year 5+); and - photo monitoring. Results will be assessed against closure criteria to determine whether vegetation community on a trajectory to sustain the PMLU. Ground and surface water quality results reflect pre-mining conditions. Groundwater seasonal oscillations reflect pre-mining recharge patterns.
Any erosion within rehabilitation areas is considered comparable to erosion present at analogue sites.				
Water quality of surface water runoff does not exceed the receiving water quality objectives listed in the EA.	Monitoring receiving water quality in accordance with the EA – Schedule E.			
Groundwater quality does not exceed the groundwater quality limits listed in the EA.	Monitor groundwater quality and depth (during all phases of the project) in accordance with the EA's Schedule F.			

9.1.1 Analogue Vegetation Surveys

Vegetation surveys were undertaken in 2015 by METServe Pty Ltd as part of an ecological assessment of the UBxP mining lease area (METServe, 2016). Thirty secondary sites were surveyed, with an additional 30 quaternary sites undertaken to verify RE classification and record dominant species in each vegetation stratum across the mining lease (**Figure 1-14**). Surveys were undertaken following the Queensland Herbarium guidelines for that period (Neldner, et al., 2012).

Analogue Site Selection

Interim reference (analogue) sites have been selected from the 2015 secondary survey sites to represent each Regional Ecosystem (RE) type scheduled for clearing and subsequent rehabilitation within the UBxP area. These sites primarily occur within the clearing footprint (**Figure 9-1**). Images from each selected reference site are presented in **Figure 9-2**.

Nine sites were selected from the 2015 secondary survey sites (**Table 9-3**) to develop interim rehabilitation BioCondition benchmarks (**Table 9-5**). Further analogue site surveys will be undertaken prior to clearing Area A to ensure vegetation community characteristics are captured, particularly for RE 3.3.20, which was not surveyed in the north of the site in 2015.

Table 9-3 Analogue site locations, Regional Ecosystem type and soil texture

Site ID	RE (2025 classification)	Community description	Soil	XCoord	YCoord
S1	RE 3.2.10a	<i>Eucalyptus tetradonta</i> and <i>Corymbia novoguineensis</i> dominated open forest on sandy soil. The understorey was dominated primarily by annual grasses.	sand	141.819618	-12.711444
S2	RE 3.2.10a	<i>Eucalyptus tetradonta</i> and <i>Corymbia novoguineensis</i> dominated open forest.	sandy	141.814061	-12.718776
S3	RE 3.2.10a	<i>Corymbia novoguineensis</i> dominated open forest on old sand dunes. Located in a narrow band of sand dunes between mangroves and vine thicket.	sandy	141.82579	-12.693183
S11	RE 3.3.20	<i>Eucalyptus tetradonta</i> and <i>Corymbia novoguineensis</i> dominated open forest on swampy sandy soil	Damp brown-grey sand with clay	141.793313	-12.761091
S12	RE 3.5.36b	<i>Eucalyptus tetradonta</i> dominated open forest on dry sandy soil	Dry sandy soil	141.79318	-12.768424
S13	RE 3.5.36b	Open forest dominated by <i>Eucalyptus tetradonta</i> , <i>Eucalyptus brassiana</i> and <i>Erythrophleum chlorostachys</i> , growing on sandy soil	Grey/brown sand	141.7848	-12.770956
S14	RE 3.5.36b	Open forest dominated by <i>Eucalyptus tetradonta</i> , <i>Eucalyptus brassiana</i> and <i>Erythrophleum chlorostachys</i> , on sandy soil	Grey/brown sand	141.784793	-12.778608
S15	RE 3.3.20	Open forest dominated by <i>Lophostemon suaveolens</i> and <i>Corymbia novoguineensis</i> on alluvial plains	Wet humus-rich sand	141.800271	-12.774793
S19	RE 3.3.20	<i>Eucalyptus tetradonta</i> and <i>Corymbia nesophila</i> open forest with a midstorey dominated by <i>Banksia dentata</i> , on swampy sandy soil	Damp sand with clay	141.799635	-12.768859

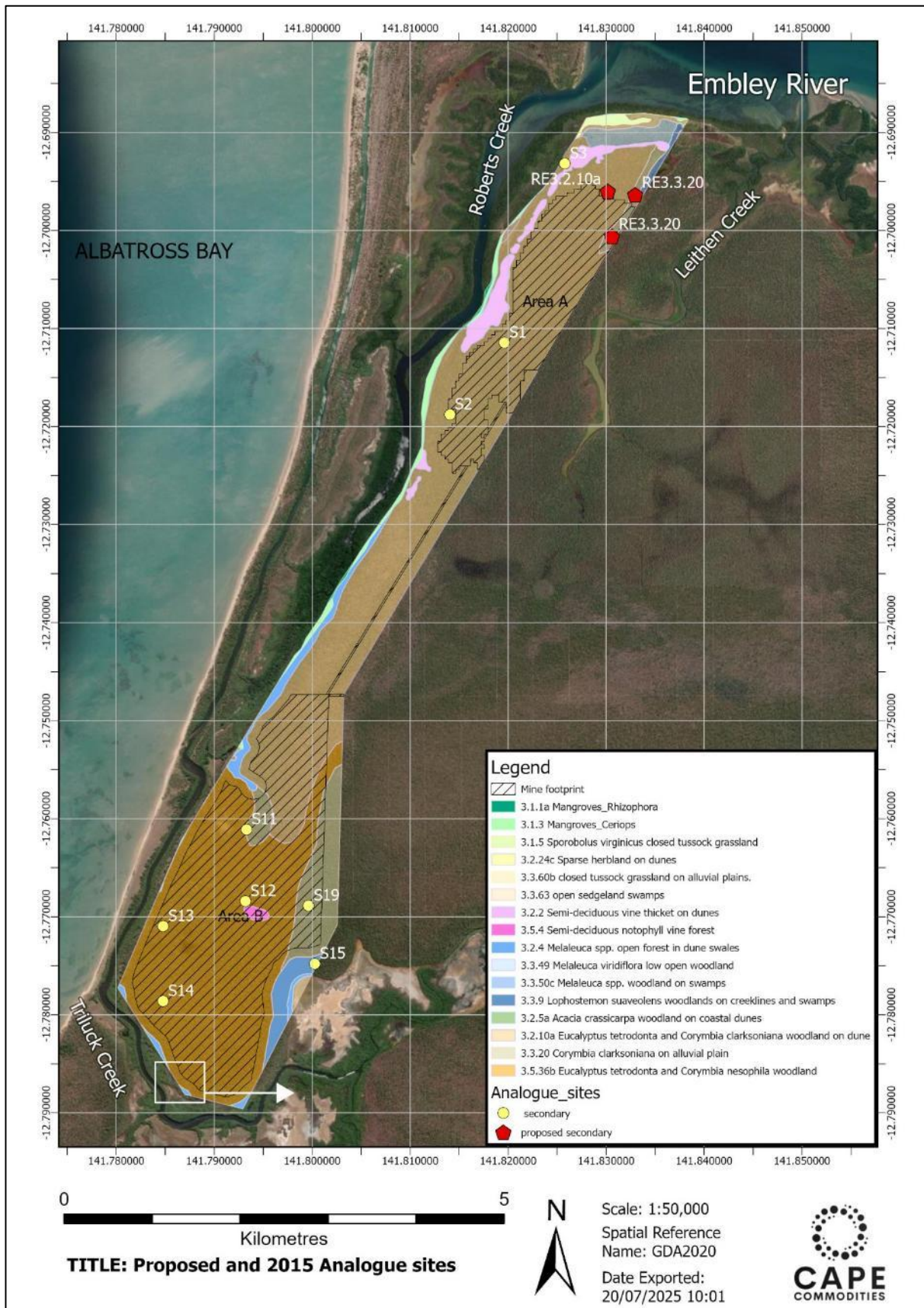


Figure 9-1 Reference sites for RE benchmark criteria



Figure 9-2 Survey site images for reference sites

Analogue Survey Methodology

Future Analogue site surveys will follow secondary site methodology for assessing regional ecosystems (Neldner, et al., 2023) utilising adapted Queensland Biodiversity and Ecology Information System (QBEIS) data sheets to allow the submission and comparison of site data with the larger database held by the Queensland Herbarium.

In addition to secondary site data, elements of the BioCondition survey methodology (Eyre et al., 2015) will be incorporated into the survey. Specifically, coarse woody debris (CWD) will be recorded to identify available fauna habitat, as recommended in Spain et al. (2023). Large trees (>20 cm DBH) will be measured within the 50 m x 10 m plots. Large trees outside the 500 m² area were detected with the Bitterlich gauge.

Summary of data to be collected

- Data collected include location, environmental and overall structural information:
- Date of survey;
- Location (X and Y coordinates, GDA2020);

- Site ID;
- Community description;
- Community width;
- Community Area;
- Regional Ecosystem;
- Soil colour and field texture
- Disturbance (including erosion, weeds, fire, storm damage, feral animal diggings);
- Structural Summary – including mean canopy height, range in height per strata, total crown cover (%) and key species;
- Percentage cover of foliage and ground cover;
- Height and DBH of all woody species above 2 m within the 500 m² survey plot;
- Tally of woody species below 2 m;
- Course Woody Debris (CWD);
- Evidence of erosion
- Basal area (Bitterlich stick method); and
- Comments – including evidence of native fauna (scats, tracks, diggings, nests, hollows).

Equipment

- Hand held Global Positioning System (GPS) – GPSMAP66i;
- DSLR camera;
- 50 m tape;
- Flagging tape;
- Densitometer;
- Nikon Laser rangefinder;
- Bitterlich gauge;
- DBH tape;
- Specimen collection bags;
- Tags;
- PVC – 1m quadrat marker;
- Proformas/clipboard/pencils; and
- Australian Soil and Land Survey Field Handbook.

Field method description

An area slated for clearing is first traversed prior to site selection. Once a site representative of the clearing area has been selected external to the clearing area, run out a 50 m tape with the long axis of the site located at right angles to the environmental gradient (parallel to the contour) where possible, ensuring the tape site remains in the RE being recorded.

1. Mark GPS location at 0 m and 50 m, recording coordinates and compass bearing of the transect.

2. Photos are taken at each end – facing North, East, South and West and ground. If the transect is not run along cardinal points, also take a photo along the transect.
3. Delineate the 500 m² area with flagging tape five metres out from the transect tape at 10 m intervals (**Figure 9-3**).
4. Estimate percentage foliage cover – using a Densitometer, record every metre along transect tape – identifying species and whether in the T1, T2, S1, S2 layer. Repeat for ground cover.
5. Record species, height, DBH and fecundity of individual woody vegetation above 2 m.
6. Record tally of individual species below 2 m.
7. Using the PVC 1 m X 1 m quadrat, record percentage ground cover within five individual plots (**Figure 9-3**), noting bare ground, leaf litter (including depth), logs and individual flora species (native and non-native).
8. Record any additional species in the RE that were not recorded in previous sections (particularly ground cover and weeds not identified within the 1 m quadrats).
9. Record coarse woody debris (CWD) in a 20 m X 50 m area (extend five metres outside the marked area).
10. Record any evidence of erosion within the 20 m X 50 m area.
11. Basal area – using Bitterlich gauge, count the number of stems that exceed the gauge (1cm), recording species and stratum. Repeat at 0 m, 25 m and 50 m mark to identify large trees beyond the quadrat.
12. Fill out any remaining sections of the data sheet including community description, evidence of fauna (native and non-native), fire history and evidence of other disturbance.

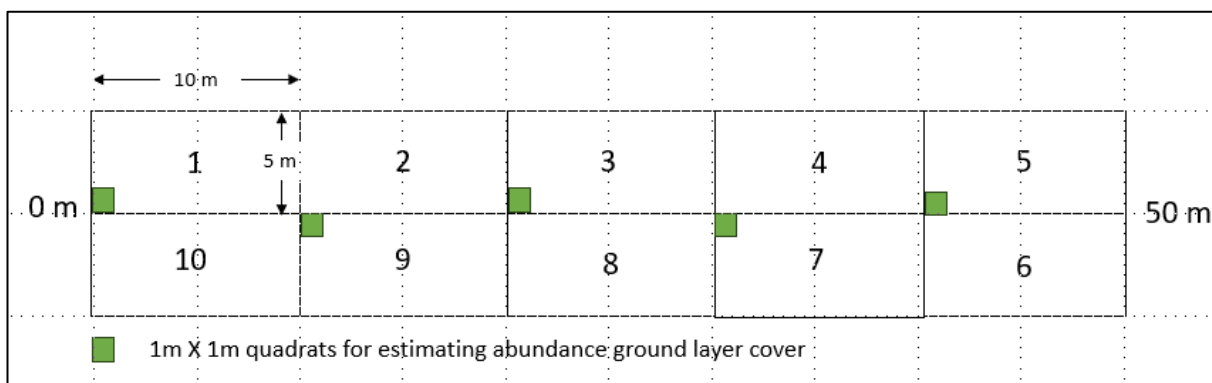


Figure 9-3 Transect Layout

9.1.2 Rehabilitation Monitoring

The rehabilitation monitoring method varies based on the age of the rehabilitation. Post-wet season monitoring will occur after the first year of establishment (quick check survey), at approximately 18 months (early establishment survey), and again at year three (interim assessment monitoring). Performance monitoring will then take place every two years to assess progress towards rehabilitation milestones. Any necessary remediation identified during these surveys, such as weed and erosion control or infill planting with tube stock, will be addressed through an ongoing maintenance program. Survey methodologies are summarised below:

9.1.2.1 Quick Check Surveys (6-8 months post rehabilitation)

Each rehabilitation area will be visited post-wet season following the year of rehabilitation. Data will be collected to identify emergence across the site including a list of species emerging (where identifiable), densities of individual species (i.e., individual, 2-10, 10-20, 21-50, >50). Ground cover development will be noted. Any weed species will be flagged for weed control during the dry season of detection.

Assessment of emergence in the presence of the mulch and placed vegetation will be undertaken to determine whether the mulch layer is interfering or assisting the emergence of seeds.

Erosion across the area will be assessed to determine whether rill, sheet or gully erosion (**Table 9-4**) is occurring, and whether management intervention is required.

9.1.2.2 Early Establishment Survey (18-21 months post rehabilitation)

Early establishment surveys will be conducted following an adapted methodology for undertaking Queensland Biodiversity and Ecology Information System (QBEIS) secondary surveys (Neldner, et al., 2023).

A 50 m transect will be applied within each rehabilitation area. Coordinates at each end of the transect will be recorded and photos taken at compass points facing N, E, S, W, the ground, and directly along the transect. Projected ground cover will be recorded at each metre along the transect, recording species present, litter or bare ground.

With the 50 m tape laid as the centre line, 10 subplots (10 m X 5 m -**Figure 9-3**), defined with flagging tape, will be surveyed for woody species emergence (count of individual stems). A 1 m x 1m quadrat will be applied every 10 m, on alternate sides of the tape where possible, to estimate percentages of each species present. A final check will identify any further species not captured within the one metre quadrats and any species of note occurring outside the 500 m² plot.

Coarse Woody Debris (CWD) will be recorded in a 20 m X 50 m area as recommended in the BioCondition methodology (Eyre et al., 2015) utilising the 50 m transect tape as the centreline.

Erosion will be assessed following the Australian Soil and Land Survey field handbook (The National Committee on Soil and Terrain, 2024) recommended parameters of state, type and severity within the same area as the CWD (**Table 9-4**). Any erosion type with a rating of 2 or higher will trigger management action, with the exception of tunnel erosion, which will trigger management intervention if present. Specific management actions will be determined by the type and severity of the erosion present and may include the installation of erosion control, recontouring of affected areas and/or application of seeds targeted towards erosion control (i.e., fast growing native creeping groundcovers and native grasses).

9.1.2.3 Interim Assessment Surveys (third year post rehabilitation)

Sites at three years old will follow the same procedure as for surveying of the analogue sites. Interim surveys will be conducted along the early establishment survey transect line, and within the previously defined plots (**Figure 9-3**) collecting the same data as recorded for the early establishment surveys.

In addition, any individuals above 2 m will have heights and diameter at breast height (DBH) recorded, with health indicators recorded. Projected vegetation canopy above the 50 m transect line will also be recorded as an indication of canopy development as the site matures.

9.1.2.4 Performance Monitoring (every two years post interim assessment)

Further monitoring will continue after the first three years. As the site matures and canopy species begin to dominate over pioneer species, a set of benchmarks derived from reference sites of the RE types to be returned in the rehabilitation will be used to assess vegetation condition, as outlined in **Table 9-5**.

Table 9-4 Erosion classification framework

Erosion classification	Minor	Moderate	Severe
Sheet erosion	Shallow soil deposits downslope	Partial exposure of roots; moderate soil deposits downslope.	Loss of surface horizon; subsoil exposure; root exposure; substantial soil deposits downslope.
Rill	<15 rills/transect*	15-30 rills per transect*	>30 rills per transect*
Gully erosion	Absent	Absent	Present
Tunnel erosion	Absent	Absent	Present
Mass movement	Absent	Absent	Present

Source: NCST (2024) Australian Soil and Land Survey Field Handbook, 4th edition. The National Committee on Soil and Terrain. CSIRO Publishing, Collingwood, Australia.

*Transect 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.

Table 9-5 Attributes and Weightings for Final BioCondition Score Assessment

	Attribute	Description and Score	Weighting (%)	Assessment area	RE3.2.10a (was 3.2.10c)	RE3.3.20 (was 3.5.22c))	RE3.5.36b (was 3.5.2)
Site-based	Large trees	Not assessable in the rehabilitation time frame as outlined in Spain et al. (2023)	0	N/A	N/A		
	Tree canopy height	<25% of benchmark height (0)	5	10 x 50 m plot*	(15 - 24) 18 m	(9 - 20) 16 m	(13 - 29) 18 m
		≥25% to 70% of benchmark height (3)					
		>70% of benchmark height (5)					
	Recruitment of canopy species	<20% of dominant canopy species present as regeneration (0)	5	10 x 50 m plot*	One to two dominant sp: <i>Eucalyptus tetradonta</i> and/or <i>Corymbia novoguineensis</i>	Two to three dominant sp: <i>Corymbia novoguineensis</i> , <i>Eucalyptus</i> spp.	<i>Eucalyptus tetradonta</i> , <i>Eucalyptus brassiana</i> , <i>Erythrophleum chlorostachys</i>
		≥20% - 75% of dominant canopy species present as regeneration (3)					
		>75% of dominant canopy species present as regeneration (5)					
		<10% of benchmark (0)	5				

	Attribute	Description and Score	Weighting (%)	Assessment area	RE3.2.10a (was 3.2.10c)	RE3.3.20 (was 3.5.22c))	RE3.5.36b (was 3.5.2)
	Tree canopy cover (%) relative to benchmark reference site	≥10% and <50% (2)		Percentage cover along the 50 m transect*.	42% T1 21% T2	29% T1 23% T2	47% T1 21% T2
		≥50% or <200% (5)					
		>200% (3)					
	Shrub layer cover (%)	<10% of benchmark shrub cover (0)	5	Percentage cover along the 50 m transect*.	19% M1	7% M1	11% M1
		>= 10 to <50% or >200% of benchmark shrub cover (3)					
		>50% or 200% benchmark shrub cover (5)					
	Coarse woody debris (CWD)	<10% of benchmark number of CWD (0)	5	50 x 20 m plot.	Not yet recorded	Not yet recorded	Not yet recorded
		>= 1- to <50% or >200% of benchmark number of CWD (2)					
		>50% to 200% benchmark number of CWD (5)					
	Native plant species richness for four lifeforms (trees, shrubs grasses and forbs)	<25% of benchmark number of species within each life-form (0)	20	50 x 10 m plot for trees and shrubs, grass and forbs.	Trees – 13 species Shrubs –7 species Graminoid –11 species Forbs –18 species	Trees –11 species Shrubs –3 species Graminoid –9 species Forbs –9 species	Trees –13 species Shrubs –7 species Graminoid –7 species Forbs –11 species
		≥25% to 90% of benchmark number of species within each life-form (2.5)					
		≥90% of benchmark number of species within each life-form (5)					
	Non-native plant cover	>50% of vegetation cover are non-native plants (0)	10	Assessed within the 50 x 10 m sub-plot (for woody veg) and 1 m x 1 m quadrats (annual weed species).	<1% (<i>Bidens bipinnata</i> present)	<1%	<1%
		≥25-50% of vegetation cover are non-native plants (3)					
		≥5-25% of vegetation cover are non-native plants (5)					
		<5% of vegetation cover are non-native plants (10)					

	Attribute	Description and Score	Weighting (%)	Assessment area	RE3.2.10a (was 3.2.10c)	RE3.3.20 (was 3.5.22c))	RE3.5.36b (was 3.5.2)
	Native perennial grass cover (%)	<10% of benchmark native perennial (or preferred and intermediate) grass cover (0)	5	Not defined within Analogue survey methodology. Average groundcover in five 1 x 1 m quadrats for rehabilitation assessment surveys.	36%	45%	58%
		≥10% to 50% of benchmark native perennial (or preferred and intermediate) grass cover (1)					
		50 – 90% of benchmark native perennial (or preferred and intermediate grass cover (3)					
		>90% of benchmark native perennial (or preferred and intermediate) grass cover (5)					
	Organic Litter cover	<10% of benchmark organic litter (0)	5	Not defined within Analogue survey methodology. Average groundcover in five 1 x 1 m quadrats for rehabilitation assessment surveys.	44%	49%	35%
		≥10% to 50% or >200% of benchmark organic litter (3)					
		≥50% or ≤200% of benchmark organic litter (5)					
	Context	LOW -The assessment unit is not connected using any of the below descriptions (0)	5	Assessable from aerial imagery			
		MEDIUM - The assessment unit: is connected with adjacent remnant vegetation along >10% to 25% of its perimeter OR is connected with adjacent remnant vegetation along <10% of its perimeter AND is connected with adjacent regrowth native vegetation > 25% of its perimeter (2)					
		HIGH - The assessment unit: is connected with adjacent remnant vegetation along 50% to 75% of its perimeter (4)					
		VERY HIGH - The assessment unit: is connected with adjacent remnant vegetation along >75% of its perimeter (5)					

	Attribute	Description and Score	Weighting (%)	Assessment area	RE3.2.10a (was 3.2.10c)	RE3.3.20 (was 3.5.22c))	RE3.5.36b (was 3.5.2)
	Connectivity	LOW - <10% remnant vegetation AND <30% native non-remnant vegetation (regrowth) (0)	5				
		MEDIUM - ≥10% to 30% remnant vegetation AND <30% regrowth OR <10% remnant vegetation AND ≥30% regrowth (2)					
		HIGH - ≥30% to 75% remnant vegetation OR ≥10% to 30% remnant vegetation AND ≥30% regrowth (4)					
		VERY HIGH - >75% remnant vegetation (5)					
		TOTAL	75				

*500 m² plot utilised for rehabilitation surveys following (Neldner, et al., 2023) as recommended in (Spain, et al., 2023).

9.1.3 Water Quality Monitoring

The Project will have a surface and groundwater monitoring program operating throughout all phases of the Project, including through rehabilitation and closure. The proposed surface and groundwater monitoring and groundwater locations that will be used to determine milestone criteria levels are outlined in **Table 1-3** and **Table 1-4** respectively. Surface and groundwater quality objectives as per the approved EA EPML04313116 are provided in **Table 9-6** and **Table 9-7**, respectively.

Table 9-6 Receiving waters contaminant limits

Quality characteristic	Unit	Limit	Limit type	Monitoring frequency
Receiving waters				
Turbidity	NTU	80th percentile ^{1,2,3} of reference ⁴ or 15 ⁶ , whichever is lower	Three consecutive samples ¹	Daily during release event (the first sample must be taken within 2 hours of commencement of release)
pH	Range	20th percentile ^{1,2,3} of reference ⁴ or 6.0 ⁵ (minimum), whichever is higher 80th percentile ^{1,2,3} of reference ⁴ or 8.0 ⁵ (maximum), whichever is lower		
Total Suspended Solids (TSS)	mg/L	80th percentile of reference or 9 ⁷ , whichever is lower		
Aluminium	µg/L	Ph<6.5 80 th percentile ^{1,2,3} of reference ⁴ or 0.8 ⁸ , whichever is lower pH>6.5 80 th percentile ^{1,2,3} of reference ⁴ or 27 ⁹ , whichever is lower		
Oil of grease	No visible film			

Source: EA EPML04313116

1. An interim trigger value can be derived from ≥ 8 but ≤ 17 consecutive reference site samples, derived using the Queensland Water Quality Guidelines (2009) methodology (section 4.3.3.1).
2. Release limits are based on the 80th percentile of at least 10 and no more than 24 consecutive reference site samples, derived using the Queensland Water Quality Guidelines (2009) methodology (section 4.3.3.1).
3. 80th percentiles are calculated using ANZECC (2000) methodology (section 7.4.4.1).
4. Reference sites must:
 - (a) have a similar flow regime
 - (b) be from the same bio-geographic and climatic region
 - (c) have similar geology, soil types and topography
 - (d) not be so close to the test sites that any disturbance at the test site also results in a change at the reference sites.
5. ANZECC (2000), default trigger levels for aquatic ecosystems indicative of slightly disturbed tropical Australian lowland river ecosystems (Table 3.3.4).
6. ANZECC (2000), default trigger levels indicative of slightly disturbed ecosystems in tropical Australia – Upland & lowland rivers (Table 3.3.5).
7. ANZECC (2000), Volume 2 - Aquatic Ecosystems – Rationale and Background Information (Chapter 8, Table 8.2.12) Suspended Solids - QLD tropical - lowland rivers (page 8.2-51).
8. ANZECC (2000), Volume 2 – Aquatic Ecosystems – Rationale and Background Information (Chapter 8, section 8.3.7) Low reliability trigger value at pH <6.5 (page 8.3-104).
9. ANZECC (2000), Trigger values for toxicants at alternate levels of protection (freshwater - 99% of species) (Table 3.4.1).
10. If three consecutive samples exceed a contaminant limit it is considered non-compliant in accordance with **condition E4 of Appendix A**.

Table 9-7 Groundwater contaminant limits

Quality characteristics	Unit	Limit ²	Groundwater limit	contaminant	Minimum frequency	monitoring
Shallow aquifer						
Aluminium ¹	mg/L	0.07	Three consecutive exceedances			
pH	Max	7.0				
	Min	5.5				
Suspended solids	mg/L	1,100				
Total dissolved solids (TDS)	mg/L	65				
Turbidity	NTU	456				
Sulphate	mg/L	7				
Electrical conductivity (EC)	µS/cm	100				
Deep aquifer					Standing Water Level (SWL) and Groundwater Quality monitored monthly	
Aluminium1	Mg/L	0.03	Three consecutive exceedances			
pH	Max	7.0				
	Min	5.5				
Total Dissolved Solids (TDS)	Mg/L	34				
Sulphate	Mg/L	1				
Electrical conductivity (EC)	µS/cm	35				
All aquifers						
Major Ions	mg/L	For interpretation purposes				
Redox potential	mV					
EC	µS/cm					

Table F2 – Groundwater contaminant limits notes:

1. To be sampled and measured as dissolved.
2. The contaminant limits specified in this table apply to all groundwater

9.2 Audits

In accordance with section 285 of the EP Act, holders of a PRC Plan schedule are required to commission a rehabilitation auditor to conduct an audit every three years. The first audit must cover the three-year period starting from the day the schedule takes effect. Subsequent audits will cover three-year periods beginning the day after the previous audit period ends. Each audit report must be submitted to the administering authority within four months of the end of the audit period.

As stipulated by section 286 of the EP Act, each audit must include:

- A statement on whether the holder has complied with the schedule during the audit period;
- A description of actions taken by the holder concerning rehabilitation and management milestones;
- An assessment of compliance with the conditions imposed on the schedule;
- A declaration confirming that the holder has not knowingly provided false or misleading information;
- An evaluation of whether the post-mining land use objectives are likely to be achieved; and

- Recommendations for actions the holder should take to ensure the achievement of rehabilitation and management milestones.

Additionally, under section 322 of the EP Act, the administering authority has the authority to issue an audit notice, requiring the holder of a PRC Plan schedule to commission an audit outside of the regular three-year cycle.

9.3 Annual Return

In addition to the annual return requirements for EAs, section 316J(3) of the EP Act stipulates that the annual return must also include an evaluation of the effectiveness of the PRC Plan schedule. This evaluation must cover the environmental management conducted under the schedule for the relevant year and must include:

- An assessment of whether all milestones specified in the PRC Plan schedule for the year have been met; and
- An evaluation of compliance with the conditions imposed on the PRC Plan schedule.

9.4 Progressive Rehabilitation Report

If a specific rehabilitation area within the tenure of the mining project has been rehabilitated in accordance with all relevant requirements of the EP Act, including the environmental authority, the PRC Plan schedule, and any applicable guidelines, the holder of the EA may apply for progressive certification.

According to section 318ZD of the EP Act, the application for progressive certification must be accompanied by a progressive rehabilitation report. The requirements for this report are detailed in section 318ZF of the EP Act.

9.5 Final Rehabilitation Report

A final rehabilitation report must be prepared when applying to surrender the EA. The purpose of this report is to demonstrate compliance with the conditions of the EA and to confirm that the rehabilitation of disturbed land has been completed satisfactorily. The requirements for this final rehabilitation report are specified in section 262 of the EP Act.

9.6 Post-mining Management Report

A post-mining management report must be submitted as part of the surrender application for the EA. This report outlines the requirements for the ongoing management of the land and includes an environmental risk assessment. The specific requirements for this post-mining management report are detailed in section 264A of the EP Act.

10 PRC Plan Schedule

This section has been prepared in accordance with Section 126D (1) of the EP Act. It includes a description of each rehabilitation area, a schedule for land availability, and detailed descriptions of the rehabilitation milestones for each area. This information is used to create a PRC Plan schedule, which outlines the timing for achieving each rehabilitation milestone progressively in each area.

10.1 Final Site Design

The final site design showing the maximum disturbance footprint, the mining lease boundaries, the PMLU for land within the mining lease and flood plain extent are shown in **Figure 10-1**.

10.1.1 Rehabilitation Areas

The proposed disturbance footprint of the Project has been divided into the following four rehabilitation areas with a common PMLU and rehabilitation methodology:

- RA1: In-pit Dump- Area A;
- RA2: In-pit Dump- Area B;
- RA3: Mine Infrastructure Area; and
- RA4: Haul Roads.

Rehabilitation Areas for the UBxP are displayed in **Figure 10-2**.

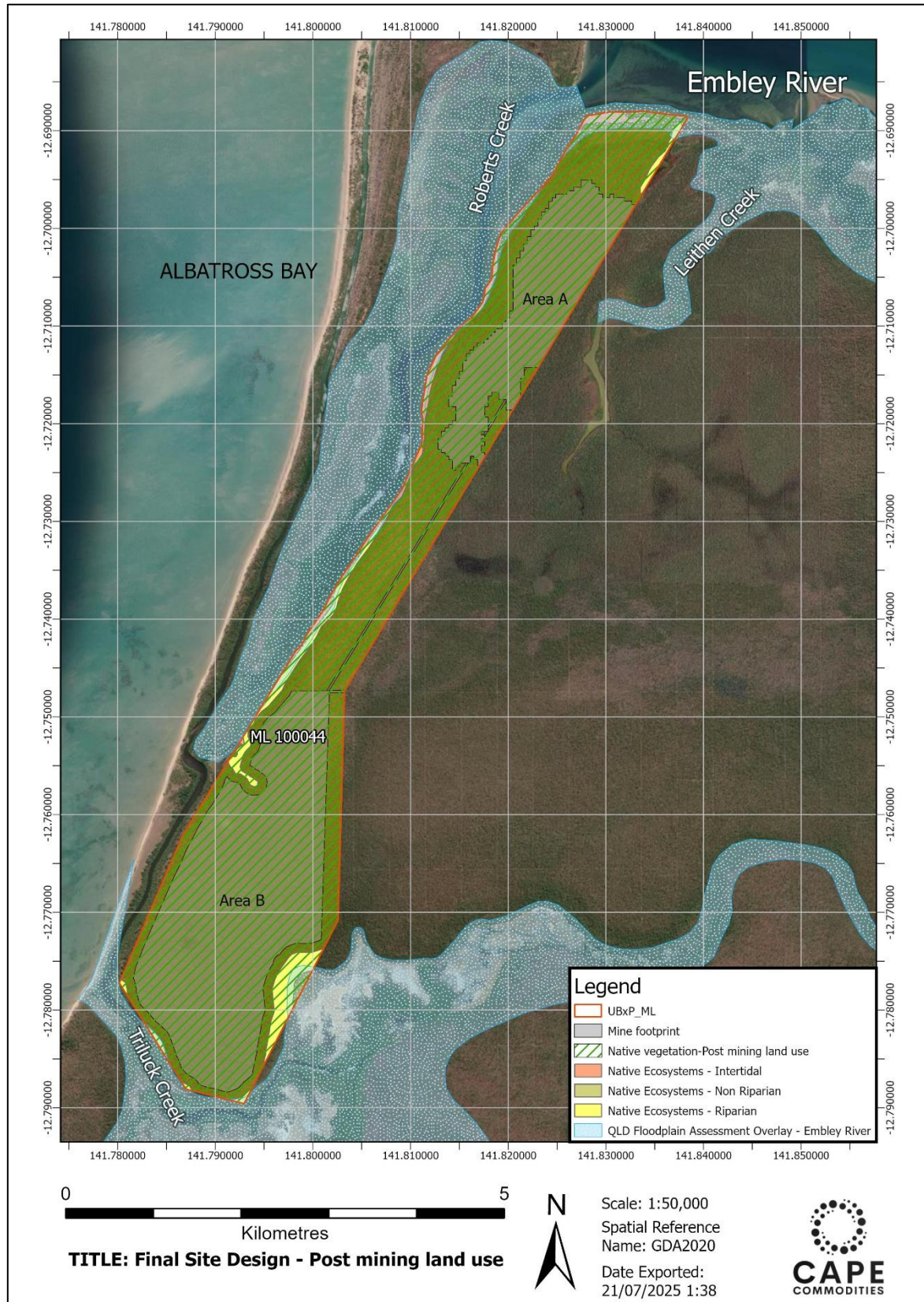


Figure 10-1 Final Site Design

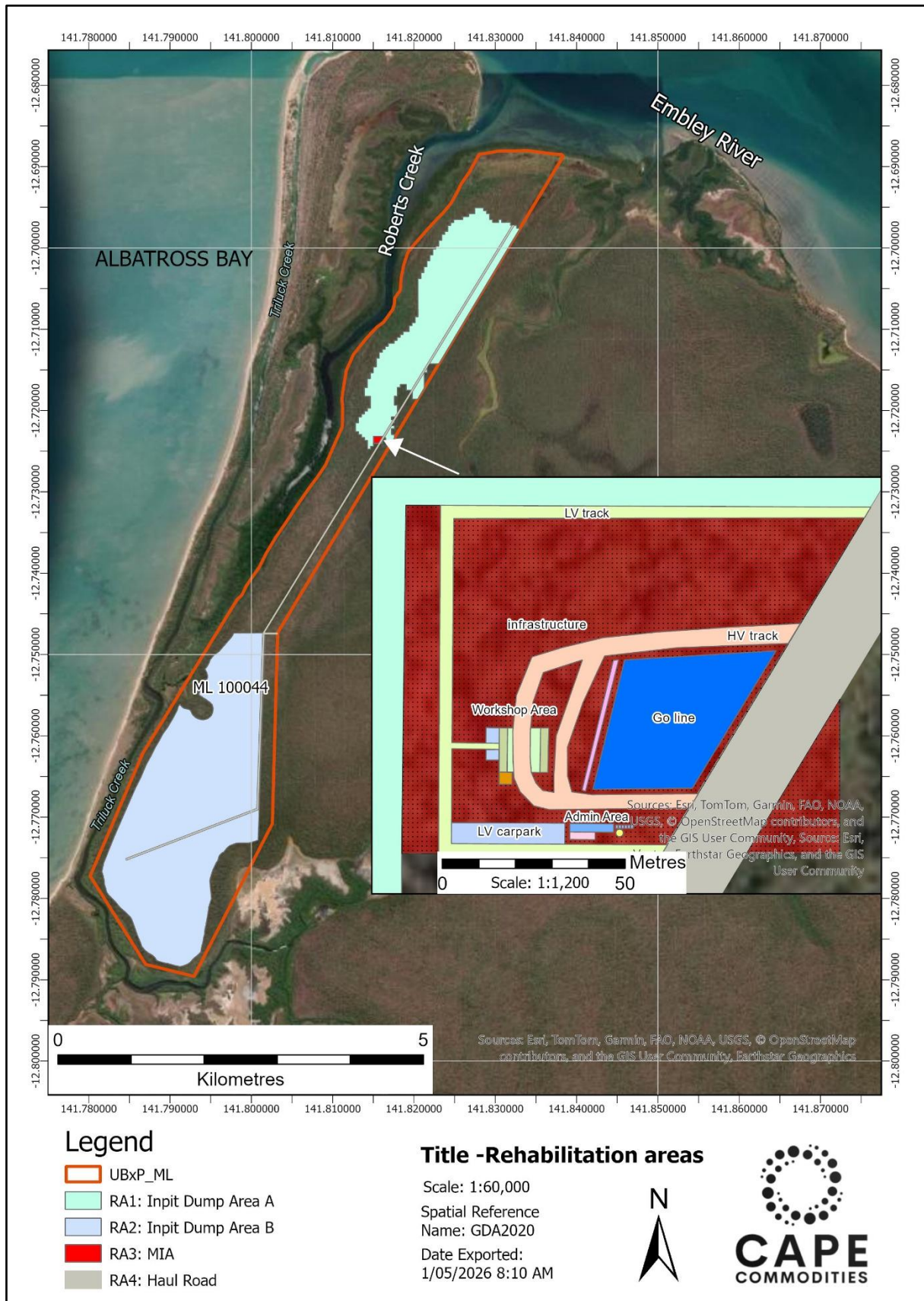


Figure 10-2 Rehabilitation Areas

10.2 Schedule of Land Availability

Land will become available for rehabilitation progressively through the life of the UBxP. Disturbed land is available for rehabilitation when:

- The land is no longer being mined;
- The land is no longer being used for operating infrastructure or machinery for mining; and
- The land is no longer being used for transport associated with operational or rehabilitation activities.

10.2.1 Timing Considerations

According to the PRCP Guideline, annual reports on rehabilitation must be based on the completion date of 10 December each year. As mentioned in **Section 1**, mining and screening operations will cease in early December prior to the wet season each year, whereby all pits to be adequately backfilled prior to the wet season and rehabilitation activities commenced. All calculations and predictions about land availability are based on a projected start date of 15 April 2025 pending wet season conditions and governmental approval.

Rehabilitation is planned to closely follow the progression of open mining, with only 2 ha actively disturbed at a time. Rehabilitation activities will begin on each mining panel before the end of the dry season when mining operations are set to pause. Rehabilitation activities will not occur during the wet season to prevent soil compaction and degradation of rehabilitated areas. Instead, regeneration of vegetation is expected to naturally commence with the onset of the wet season.

One key rehabilitation milestone, revegetation, is highly dependent on the wet season rains. It is expected that any land made available for rehabilitation after mid-October in a given calendar year will not have enough time for decontamination and final landform shaping before the wet season begins (December to January, depending on the year). As a result, delaying the start of rehabilitation for such land until the following year will not affect the timing of the revegetation stage. Land available for rehabilitation before mid-October will start the rehabilitation process within the same calendar year. Rehabilitation milestones RM1, RM2, RM3 and RM4 (see **Section 10.3**) are expected to be completed within 3 months of the area becoming available. RM5 will follow and will be completed within 2 years prior to the onset of the wet season for that particular year to allow enough time for a successful planting program.

Following RM5, an indicative ten-year period between the completion of RM5 and completion of RM6 and RM7 has been included in the PRCP Schedule. This is to allow time for woody tree establishment and ensure achievement of the completion criteria.

Due to the lack of alternate roads and tracks allowing access to the UBxP site, the initial revegetation of all access tracks will solely focus on groundcover species (e.g. grasses/herbs). All access tracks across the site will remain necessary for rehabilitation monitoring purposes, until all rehabilitation areas are certified. Application of groundcover vegetation will ensure a safe and stable landform while also allowing periodic access to rehabilitation areas via ATV for monitoring purposes. Once an access track is no longer required for rehabilitation monitoring (e.g. when an area has been certified), infill planting with tube stock vegetation will occur. Additionally, given the close connection of access tracks to other revegetated rehabilitation areas, natural establishment of woody tree species along these tracks is likely to occur.

10.2.2 Schedule of Availability

The schedule of land availability for rehabilitation in each rehabilitation area is shown in **Table 10-1**.

Table 10-1 Schedule of land availability for rehabilitation

Rehabilitation Area		Land available for rehabilitation in each year (ha)*							Total by RA (ha)
		2028	2029	2030	2031	2032	2033	2034	
RA1	In-pit dump Area A	14.9	21.9	37.1	53.9	63.4	28.8	0.0	220.0
RA2	In-pit dump Area B	0	0	0	0	0	281.3	257.3	538.6
RA3	Mine Infrastructure Area	0	0	0	0	0	0	1.0	1.0
RA4	Haul Road	0	0	0	0	0	0	21.9	21.9
Total by year		14.9	21.9	37.1	53.9	63.4	310.1	280.2	781.5

Note: *Land areas represent hectares of land that becomes available for the first time in that year (i.e., is not cumulative across years).

10.3 Rehabilitation Milestones

Rehabilitation milestones relevant to the UBxP area are listed in **Table 10-2**.

Table 10-2 Rehabilitation Milestones

Code	Milestone	Applicable Rehabilitation Areas
RM1	Infrastructure decommissions and removal.	RA1, RA2, RA3
RM2	Remediation of contaminated land	RA2
RM3	Landform development and reshaping/reprofiling.	RA1, RA2, RA3
RM4	Surface preparation	RA1, RA2, RA3
RM5	Revegetation	RA1, RA2, RA3, RA4, RA5
RM6	Achievement of surface requirements	RA1, RA2, RA3, RA4, RA5
RM7	Achievement of stable PMLU	RA1, RA2, RA3, RA5

10.4 Milestone Criteria

Milestone criteria pertaining to each of the rehabilitation milestones are listed in **Table 10-3**.

Table 10-3 Milestone Criteria

Code	Milestone	Description
RM1	Infrastructure decommissions and removal.	1.1: Remove all project infrastructure (buildings, plant) and service infrastructure from site, including; (a) All services disconnected, terminated and removed. (b) All buildings and associated infrastructure dismantled and removed offsite. (c) All hardstand, concrete areas and roads (bitumen, blue metal, aggregate etc.) removed. (d) All fencing and associated foundations removed. (e) All pipelines drained and removed. (f) All waste not authorised to be disposed of on-site under Environmental Authority EPML04313116 removed. (g) All surface water drainage infrastructure that does have an associated watercourse or riparian ecosystem PMLU is removed. (h) All drillholes, bores, sediment ponds and sumps decommissioned. (i) All machinery and equipment, not required for rehabilitation works removed from site. 1.2: Below-ground infrastructure and services deeper than 0.5m in relation to the final landform surface may be retained provided: (a) All pipelines have been drained and capped or filled with inert material; and (b) All below-ground infrastructure to be retained is mapped; and (c) The intended PMLU is not compromised; and (d) There is no ongoing risk of environmental harm.
RM2	Identification, remediation and removal of contaminated land	2.1: Contaminated land investigation (investigation, remediation and validation) completed by an SQP in accordance with appropriate guidance, including but not limited to the ASC NEPM and National Remediation Framework (NRF). 2.2: Contaminated and hazardous material either remediated in-situ or removed/transported to facility lawfully able to accept the material. 2.3: Contaminated Land Auditor certifies that no contamination unsuitable for the PMLU remains or is occurring.
RM3	Landform development and reshaping/reprofiling.	3.1: Major earthworks (including reshaping, pushing/trimming) completed in accordance with design specifications for a final stable landform provided by an AQP. 3.2 An "As-Constructed Report" prepared which details and justifies all variations to the design, including a certification that such variations will not affect the design performance. 3.3 Landform is free draining and consistent with the surrounding landform. 3.4 Constructed landform achieves geotechnical stability with a Factor of Safety (FOS) ≥ 1.5, 3.5 Disturbed slopes <5m tall and <15 degrees. 3.6 All mined pits backfilled to mimic original surface topography. 3.7 Disturbed natural flow paths returned to a natural condition with profile similar to the pre-disturbance condition. 3.8 All landforms are shaped to be free draining. 3.9 Where necessary, erosion and sediment control systems are installed, fit for purpose and designed by an AQP. 3.10 Infrastructure area and tracks ripped and shaped to conform to surrounding areas. 3.11 No evidence of erosion classified as 'moderate' or 'severe' as defined by Table 9-4- Erosion classification framework. 3.12 Independent AQP has surveyed the final landform and certified that RM3.1-RM3.11 have been achieved.

Code	Milestone	Description
RM4	Surface preparation	4.1 Any erosion classified as 'moderate' or 'severe' as defined in Table 9-4 – Erosion classification framework - has been remediated prior to topsoil application. 4.2 Areas of ponding have been remediated and are free draining prior to topsoil application. 4.3 Growth media is ameliorated as determined by the results of field trials and completed by an AQP. 4.4 Large felled timber returned to provide fauna habitat while the rehabilitation establishes. 4.5 The surface and groundwater monitoring is underway (at least one year of sampling undertaken).
RM5	Revegetation (native vegetation)	5.1 Seeding completed using the seed mix and sowing rates in Table 6-4 – Species list and seeding rates or as amended for additional native endemic species as recommended by an AQP. 5.2 Non-native seed must not be used for the revegetation (except when sterile cover crops are used). 5.3 Appropriate erosion controls installed/placed and functioning as designed (as per AQP certified report) to ensure plant establishment is not significantly impacted from erosive events. 5.4 Any species not establishing after seeding (as identified 12 months after seeding have been planted as tube stock in rehabilitation areas at a density suitable to establish the tree cover and shrub cover of the relevant regional ecosystem. 5.5 Supplementary seeding and tube stock planting has been completed within one year of sites failing to achieve vegetation establishment on initial attempt. 5.6 No evidence of erosion classification classified as 'moderate' or 'severe' as defined in Table 9-4 – Erosion classification framework. 5.7 Independent AQP has certified the achievement of RM5.1-RM5.6.
RM6	Achievement of surface requirements (native vegetation)	6.1 Species in rehabilitated areas have shown evidence of germination and emergence and are expected to continue to do so. Evidence of flora recruitment from rehabilitation monitoring data. 6.2 No patches of exposed, areas of soil (<5% cover of vegetation organic litter) exceed 25m2 in area. 6.3 A BioCondition assessment has been undertaken by an AQP using the methodology outlined in the latest version of the Queensland Herbarium "BioCondition Assessment Manual" - with secondary sites used to determine site-specific BioCondition benchmarks to determine the tree species composition and density." 6.4 The BioCondition assessment completed under RM6.3 complies with the PRCP Benchmark for the PMLU, as per Table 9-5 - Benchmarks for Rehabilitation Areas. 6.5 Rehabilitation area is on a trajectory to sustain the PMLU and is comparable to analogue sites (>75% similarity to species richness, diversity and density), as outlined in - Table 9-3- Analogue Site Descriptions. 6.6 Absence of ecosystem altering weeds. Weed presence is a less than 5% of total vegetative cover. 6.7 With respect to erosion: (a) No evidence of erosion classified as 'Moderate' or 'Severe' as defined by Table 9-4– Erosion classification framework. (b) Any erosion present will not compromise the achievement of a PMLU to a stable condition. (c) Erosion requiring intervention has been remediated and does not impact achieving the PMLU. 6.8 Corrective action arising from the routine inspections program have been undertaken.

Code	Milestone	Description
		6.9 Surface water runoff has been collected across representative areas of rehabilitation when surface flows occur and it is safe to do so. 6.10 Surface water runoff is on a trajectory to achieving values in Table 9-6 – Surface water quality limits. 6.11 The growth media (topsoil and subsoil) physical, chemical and biological properties does not limit vegetation cover performance or restrict the potential effective depth of rooting. 6.12 Independent AQP certifies the area as being safe, stable and non-polluting and achievement of RM6.1-6.11.
RM7	Achievement of stable PMLU (native ecosystems)	7.1 Safety hazards in the rehabilitation area are not significantly different to surrounding unmined landscapes subject to the same land use. 7.2 All corrective actions recommended by an AQP in response to erosion or deficient vegetation cover have been implemented. 7.3 A BioCondition assessment has been undertaken by an AQP using the methodology outlined in the latest version of the Queensland Herbarium's 'BioCondition Assessment Manual'. 7.4 The assessment completed under RM7.3 has confirmed the developing vegetation community is on a trajectory to sustain the PMLU and is comparable to analogue sites (>75% similarity to species richness, diversity and density), as outlined in Table 9-3 -Analogue site descriptions 7.5 No declared weeds defined under the Biosecurity Act 2014. 7.6 No bare areas greater than 25m² are present. 7.7 Non-native plant cover in rehabilitated areas is ≤ 5%. 7.8 No active rill, gully, tunnel, sheet erosion or mass movement greater than minor erosion visible. 7.9 No built structures remain. 7.10 Surface water runoff complies with Table 9-6 – Surface water quality limits. 7.11 Surface water quality results monitored monthly during flow at, but not limited to, downstream locations specified in Table 1-3 – Surface water monitoring locations, must not exceed the limits in Table 9-6 - Surface water quality limits, for a minimum of 5 consecutive years. 7.12 If the surface water quality exceeds criteria in RM7.11, the applicable upstream site must be compared to the downstream site result; and quality result measured at a downstream site must be equal to or less than the quality result measured at the applicable upstream site¹. 7.13 For a minimum of five consecutive years groundwater quality must be monitored quarterly at, but not limited to, bores specified in Table 1-4 – Groundwater monitoring locations, for all quality characteristics listed in Table 9-7 – Groundwater quality limits. 7.14 Groundwater quality results must not exceed the limits Table 9-7– Groundwater quality limits, for 3 consecutive results. 7.15 Groundwater level is monitored quarterly and for a minimum of 5 consecutive years. 7.16 Groundwater levels have recovered to pre-mining patterns of seasonal recharge from between ~4 m AHD in the wet season to ~ 1 m AHD during the dry season. Actual expected heights will vary between bores. 7.17 Independent AQP certifies achievement of RM 7.1-7.16 and that the landform is stable.

10.5 PRC Plan Schedule

The PRC Plan Schedule is provided in **Appendix F**.

11 Revision of the PRC Plan

The holder of a PRC Plan may, at any time, apply to the administering authority to amend their PRC Plan schedule (an amendment application). An application may be made to amend only the PRC Plan schedule, or as part of an amendment application for an EA. An amendment application must be submitted in the approved form and be accompanied by the relevant fee and an amended rehabilitation planning part for the holder's PRC Plan that complies with section 126C of the EP Act. Due to the dependencies between an EA and the PRC Plan schedule, an applicant should always consider whether a proposed amendment to the PRCP schedule requires a concurrent amendment to the EA in order to ensure consistency between both instruments.

Once a PRC Plan schedule has been amended, the rehabilitation planning part of the PRC Plan must be reviewed and revised to make any necessary or appropriate changes. The administering authority is to be provided with a copy of the amended PRC Plan within 10 business days of receiving a copy of the amended PRC Plan schedule (or receiving written notice under section 211 of the EP Act), unless the administering authority agrees to a longer period.

12 Spatial Information

Shapefiles detailing the following spatial information will be submitted in conjunction with this PRC Plan:

- The location and maximum extent of the disturbance footprint for the mine life;
- The PMLU for the area within the resource tenures; and
- The rehabilitation areas with the resource tenures.

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Appendix A- Environmental Authority EPML04313116

Appendix B- Water Management Plan

Appendix C- Erosion and Sediment Control Plan

Appendix D- Terrestrial Ecology Report

Appendix E- Rehabilitation Management Plan

Appendix F- PRCP Schedule