



Site	Wongawilli Colliery	DOC ID	WWC EC PLN 009
Type	Plan	Date Published	12 October 2022
Doc Title	BIODIVERSITY MANAGEMENT PLAN		

WONGAWILLI COLLIERY

PA 09_0161

BIODIVERSITY MANAGEMENT PLAN

WWC EC PLN 009

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ABBREVIATIONS

APZ	Asset Protection Zone
BC Act	<i>Biodiversity Conservation Act 2016</i>
BCS	Biodiversity Conservation and Science Directorate
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
DPE	Department of Planning and Environment
EEC	Endangered Ecological Community
EMM	EMM Consulting Pty Limited
EMS	Environmental Management Strategy
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environment Protection Licence
EP&A Act	Environmental Planning and Assessment Act 1979
FTEs	Full time equivalents
GDE	Groundwater dependent ecosystem
JSPL	Jindal Steel and Power Limited
Km	Kilometre
LGA	Local government area
LLS	Local Land Services
m	Metre
Mining Act	<i>Mining Act 1992</i>
NWMD	North West Mains Development
PCT	Plant Community Type
RAM	Rapid Assessment Methodology
ROM	Run of mine
SMP	Subsidence Management Plan
TARP	Trigger Action Response Plan
TEC	Threatened ecological community
WCL	Wollongong Coal Limited
WWC	Wongawilli Colliery

1 INTRODUCTION

This Biodiversity Management Plan (management plan) has been prepared for Wollongong Coal Limited (WCL) to manage biodiversity impacts from the Wongawilli Colliery (WWC) operations.

1.1 Project Background

WWC is a well-established underground coal mine located approximately 15 kilometres (km) south-west of Wollongong within the Wollongong and Wingecarribee local government areas (LGAs) as shown in **Figure 1.1**. The mine is owned and operated by WCL, which is majority owned by Jindal Steel and Power Limited (JSPL).

WWC commenced operations in 1916 and until 2 November 2011 operated under Section 74 of the NSW *Mining Act 1992* (Mining Act).

Project Approval (PA 09_0161) was granted on 2 November 2011 by the then Planning Assessment Commission (now the Independent Planning Commission under the now repealed Part 3A of the *Environmental Planning and Assessment Act 1979* [EP&A Act]).

PA 09_0161 has been modified on two occasions to enable the continuation of mining operations. A summary of the approvals relevant to WWC is provided in **Table 1.1**.

Table 1.1 WWC Approvals Summary

Approval	Date granted	Overview
PA 09_0161	2 November 2011	Consolidation and continuation of mining operations.
PA 09_0161 (MOD 1)	27 November 2015	Extending the approved duration of mining operations by 5 years, to 2020.
PA 09_0161 (MOD 2)	13 April 2022	Extend the life of the Colliery by 5 years to enable continued development of the North West Mains Development (NWMD).

The approval, as modified, allows WCL to:

- undertake mining operations until 30 June 2027;
- extract up to 486,000 tonnes of run of mine (ROM) coal;
- transport coal from the site by rail; and
- operate ancillary mining infrastructure, including coal handling, processing and rail load out facilities.

1.2 Approved Operation

The approved WWC operations are summarised in **Table 1.2**.

Table 1.2 Summary of Approved WWC Operations

Element	Approved operations
Operating hours	24 hours per day, seven days per week. Unloading from coal handling / train loading infrastructure occurring during normal operational hours: 7 am to 6 pm Monday to Friday; 8 am to 4 pm Saturday; and - no time on Sundays and public holidays. Conveyance of coal from the Wongawilli upper pit top to the lower pit top to occur only during the normal operational hours of: 7 am to 6 pm Monday to Friday; 8 am to 4 pm Saturday; and - no time on Sundays and public holidays. Operations at the lower pit top to occur only during the normal operational hours of: 7 am to 6 pm Monday to Friday; 8 am to 4 pm Saturday; and - no time on Sundays and public holidays.
Coal seams	Bulli and Wongawilli Coal Seams.
Extraction rate	486,000 tonnes of ROM coal over the remaining life of this consent.
Approval period ending	30 June 2027.
Mining method	First working mining methods only.
Underground workings	Four 5.5 metre (m) wide by 3.6 m high roadways to enable access to the existing Wongawilli Shaft 1.
Existing Mine infrastructure (Wongawilli upper pit top)	- Administration offices - Material and chemical storage areas - Workshops - Bathhouse - Fuel and wash bays
Existing Mine infrastructure (Wongawilli lower pit top)	- Coal storage / loading bins - Stockpile area 6 m high noise barrier
Avondale pit top	- Two portals - Cleared pad
Other infrastructure areas	Garden storage area.
Rail transport	Maximum of 4 (one way) train movements a day. No train movements at night (i.e. the period from 10 pm to 7 am on Monday to Saturday, and 10 pm to 8 am on Sundays and Public Holidays).
Waste management	Waste rock to be stored underground within existing and proposed NWMD workings or utilised on the surface for landscaping and rehabilitation purposes.

Table 1.2 Summary of Approved WWC Operations

Element	Approved operations
Mine ventilation	• Mine portals and vent shafts including; • two portals for personnel and materials; • one portal for coal extraction; • four access portals into the NWMD; – North West Mains B Portal; – North West Mains C Portal; – W9 Belt Conveyor Portal; – W10 Portal; and • Wongawilli Shaft 1, Nebo Shaft 3 and 4. Existing Nebo area portals (Wonga Belts and Wonga Track) and ventilation shafts (Vent Shaft 3 and 4) are proposed to be closed off and rehabilitated and will no longer be in use.
Workforce	Employment of up to 150 full time equivalents (FTEs).

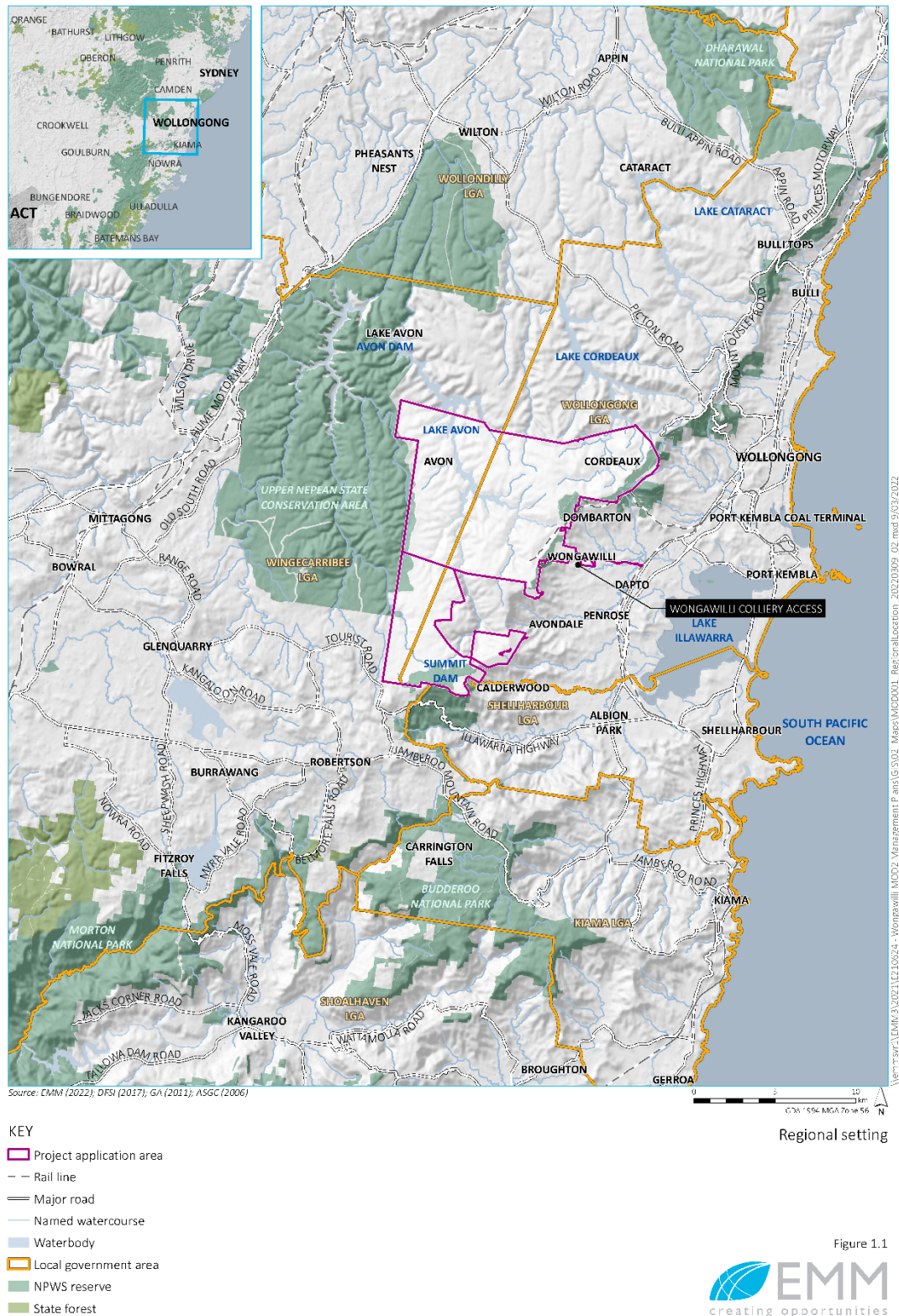
The location of approved mine workings is shown on **Figure 1.2**. Existing and proposed infrastructure at the Wongawilli upper pit top and Wongawilli lower pit top are shown in **Figure 1.3** and **Figure 1.4** respectively.

1.3 Construction Activities

Construction activities approved under MOD 2 include:

- an extension of the Wongawilli lower pit top noise wall; and
- improvements to the coal conveyance network including the construction of a new section of coal conveyor, approximately 60 m in length and coal storage bin at Wongawilli upper pit top.

Figure 1.1 Regional Setting



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Figure 1.2 Approved Mining Area

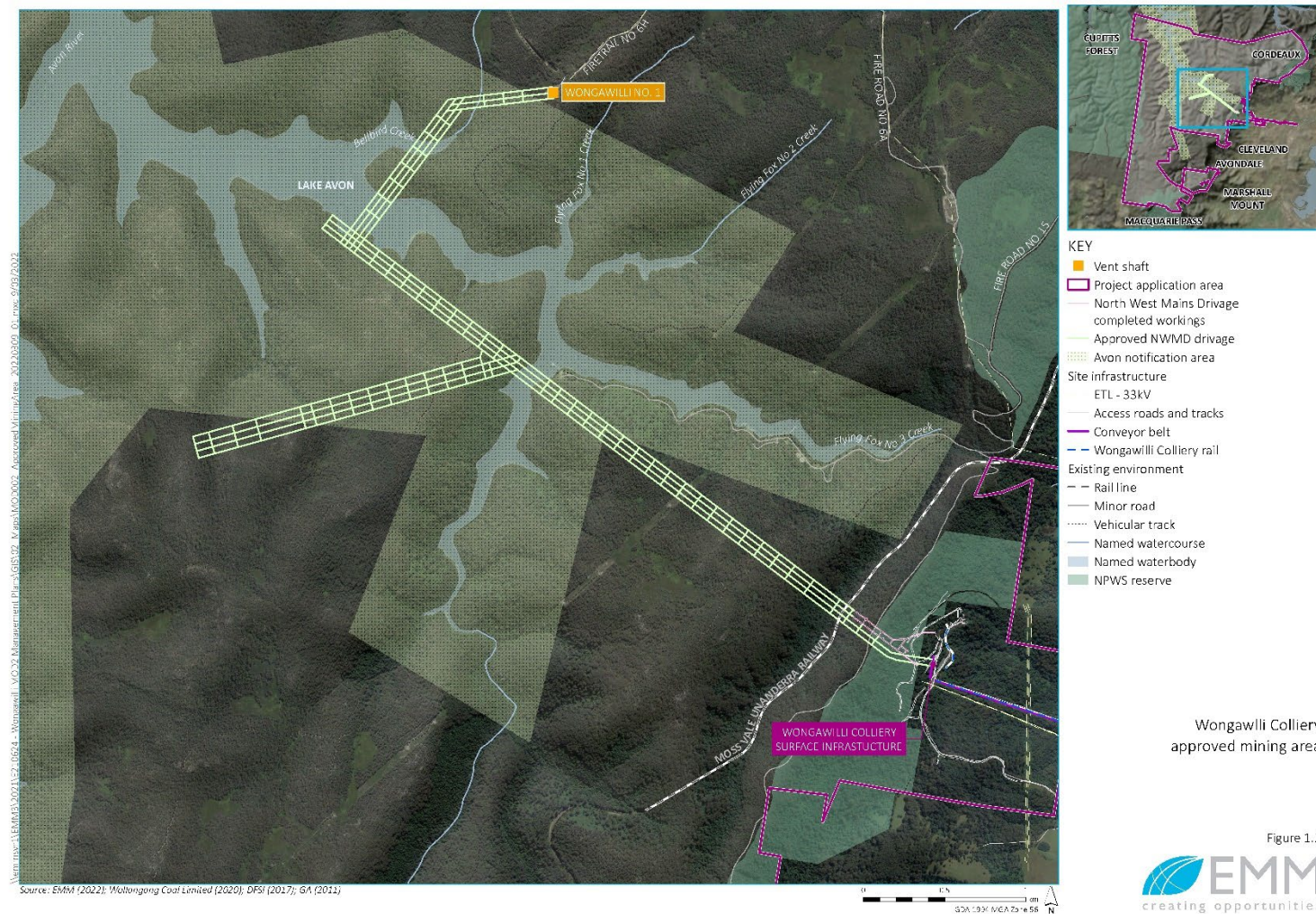
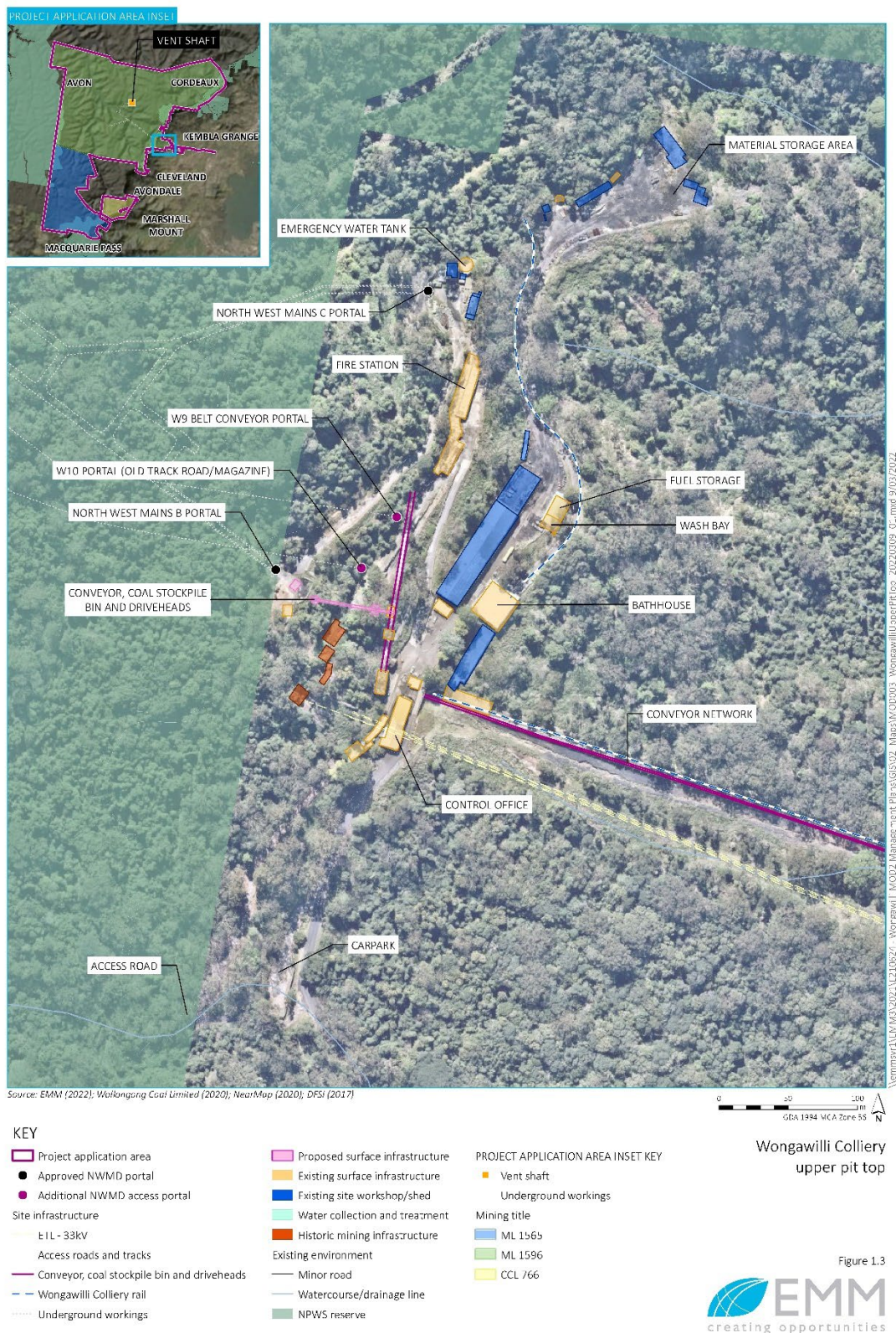
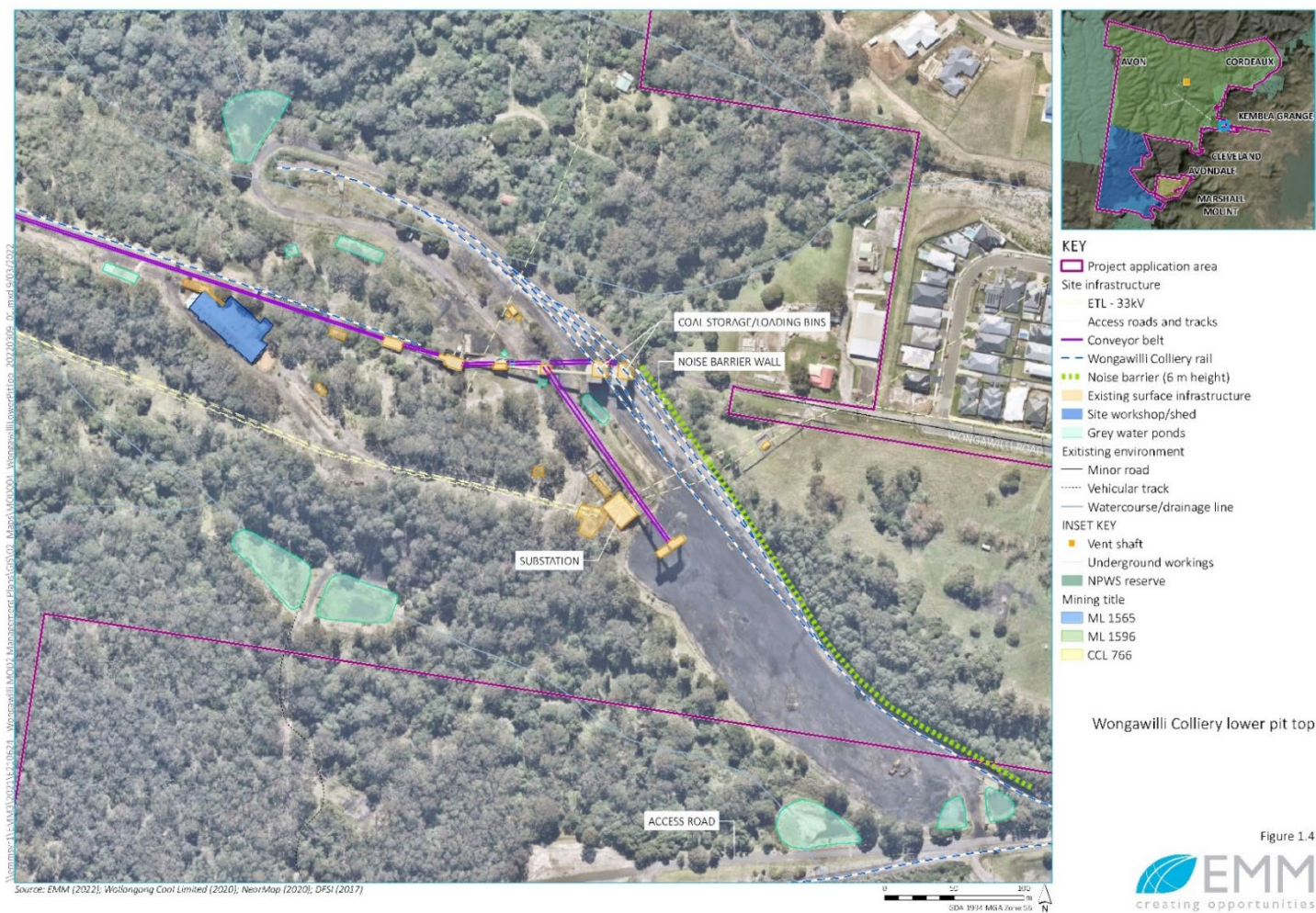


Figure 1.3 Wongawilli Upper Pit Top Existing and Proposed Infrastructure



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Figure 1.4 Wongawilli Lower Pit Top Existing and Proposed Infrastructure



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1.4 Purpose and Scope

This management plan has been prepared to manage the potential impacts to biodiversity from WWC operations.

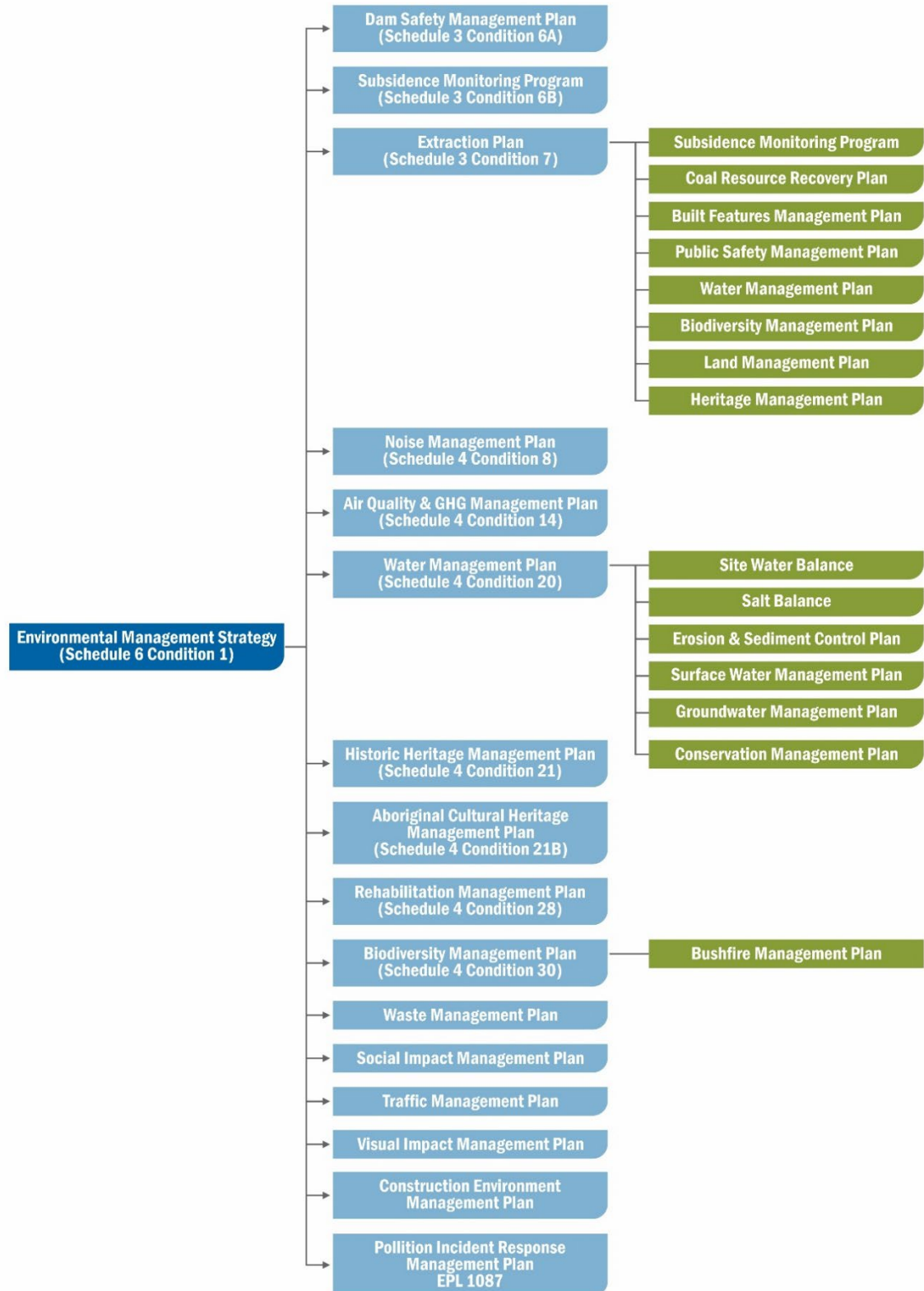
This management plan is a part of a larger suite of operational environmental management documents for the WWC operations developed as part of WCL's environmental management system which has been designed to be generally consistent with ISO 14001:2015 - Environmental Management Systems.

The overarching document in the environmental management system is WCL's Environmental Management Strategy (EMS). The EMS has been developed to provide a framework to ensure activities at WWC are undertaken in an environmentally responsible manner. The EMS forms part of the hierarchy of documents that enables WCL to establish and sustain a high level of environmental performance in all facets of its business. The structure of the EMS is summarised in **Figure 1.5**.

1.5 Management Plan Preparation

This management plan has been prepared by EMM Consulting Pty Limited (EMM) on behalf of WCL.

Figure 1.5 EMS Structure



2 REGULATORY REQUIREMENTS

2.1 Overview

This management plan has been prepared to fulfil the requirements of relevant legislation, approval conditions, commitments in environmental assessments, Environment Protection Licence (EPL) conditions, and relevant standards and guidelines.

The following sections summarise those regulatory requirements that are most relevant in relation to this management plan.

2.2 Legislative Requirements

Legislation applicable to biodiversity management in NSW includes but is not limited to:

- Environment Protection and Biodiversity Conservation Act 1999;
- Environmental Planning and Assessment Act 1979;
- Biodiversity Conservation Act 2016;
- Fisheries Management Act 1994;
- Biosecurity Act 2015;
- State Environmental Planning Policy Koala Habitat Protection 2019 (Koala SEPP); and
- Wollongong City Council Local Environment Plan 2009.

2.3 Project Approval

The conditions of PA 09_0161 relevant to this management plan and where they have been addressed within this management plan are provided in **Table 2.1**.

Table 2.1 PA 09_0161 – Biodiversity Management Plan Requirements

Condition No.	Condition – details	Where addressed
Biodiversity Management Plan		
Schedule 4 Condition 30	The Applicant must prepare a Biodiversity Management Plan for the development, to the satisfaction of the Secretary. This plan must:	This document
(a)	be prepared by a suitably qualified and experienced person/s;	Section 1.5
(b)	be prepared in consultation with BCS	Section 3.1 and Appendix C
(c)	be approved by the Secretary prior to the recommencement of mining operations following approval of Modification 2;	Noted
(d)	establish baseline data for the existing habitat on site, including water table depth, vegetation condition, stream morphology and threatened species habitat;	Section 4

Table 2.1 PA 09_0161 – Biodiversity Management Plan Requirements

Condition No.	Condition – details	Where addressed
(e)	describe the short, medium, and long-term measures to be undertaken to manage the remnant vegetation and habitat on the site;	Section 7
(f)	include detailed performance indicators for the biodiversity related performance measures in Table 1	Section 5
(g)	describe the measures that would be implemented to:	
	ensure compliance with the biodiversity related performance measures in Table 1;	Section 6 and Section 7
	minimise impacts to biodiversity on the site, including any species and communities listed under the BC Act and EPBC Act;	Section 7
	protect vegetation and fauna habitat outside of the approved disturbance areas;	Section 7
	control weeds, including measures to avoid and mitigate the spread of noxious weeds;	Section 7
	control feral pests;	Section 7
	control erosion;	Section 7
	control access to vegetated or revegetated areas; and	Section 7
	manage bushfire hazards;	Section 7 and Appendix A
(h)	include a program to monitor and report on the effectiveness of the above measures and identify measures that could be implemented to improve biodiversity outcomes; and	Section 6, Section 11 and Section 12
(i)	include details of who would be responsible for monitoring, reviewing, and implementing the plan.	Section 12.1

Management plan requirements

Schedule 6 Condition 2	The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	Section 2
(a)	detailed baseline data;	Section 4
(b)	a description of:	
	the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 2
	any relevant limits or performance measures/criteria;	Section 5
	the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 5

Table 2.1 PA 09_0161 – Biodiversity Management Plan Requirements

Condition No.	Condition – details	Where addressed
(c)	a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 6 and Section 7
(d)	a program to monitor and report on the:	
▪	impacts and environmental performance of the development;	Section 6 and Section 11
▪	effectiveness of any management measures (see (c) above);	Section 7
(e)	a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 8
(f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 12
(g)	a protocol for managing and reporting any:	
▪	incidents;	Section 10 and Section 11
▪	complaints;	Section 10.2 and Section 11.4
▪	non-compliances with conditions of this consent and statutory requirements; and	Section 10 and Section 11
▪	exceedances of the impact assessment criteria and/or performance criteria; and	Section 10 and Section 11
(h)	a protocol for periodic review of the plan.	Section 13

A summary of commitments relating to biodiversity management made in environmental assessment reports and where they have been addressed in this management plan is provided in **Appendix B**.

2.4 Environment Protection Licence

WWC operates under EPL 1087. There are no conditions within EPL 1087 relevant to biodiversity management.

Avondale Colliery operates under EPL 12442. There are no conditions within EPL 12442 relevant to biodiversity management.

2.5 Guidelines and Standards

This management plan has been developed with reference to the following relevant guidelines and standards:

- Saving our Species Hygiene Guidelines, State of New South Wales and Department of Planning, Industry and Environment 2020; and

- DPI Policy and Guidelines: Aquatic Habitat Management and Fish Conservation, NSW Fisheries. 1999.

3 CONSULTATION

3.1 Management Plan Consultation

Consultation on the development of this management plan has been undertaken with the Biodiversity Conservation and Science Directorate (BCS). A summary of correspondence, key issues raised, and how they have been addressed is provided in **Appendix C**.

3.2 Community Consultative Committee

As detailed in **Section 11.5**, WCL has an established Community Consultative Committee (CCC) for WWC that operates generally in accordance with the Department of Planning and Environment (DPE) Community Consultative Committee Guideline for State Significant Projects (January 2019). The CCC is a forum to discuss the development and outcomes of monitoring programs. The CCC meets four times a year and consists of an independent chair, representatives from the community, representatives from Wollongong City Council and representatives from WCL. The results of biodiversity management and any complaints regarding biodiversity on site will be presented to the CCC. Minutes of the meetings are made available on the WCL website.

4 BASELINE DATA

4.1 Site context

The WWC operation is located within the Hawkesbury Nepean catchment, within the WaterNSW Metropolitan Special Area.

4.2 Vegetation communities

The plant community types (PCTs) identified through the MOD 2 environmental assessment as being located above the NWMD mining area are detailed in **Table 4.1** and shown in **Figure 4.1**.

Table 4.1 NWMP Plant Community Types and Condition

PCT	Condition
PCT 1804 – Needlebush – Banksia wet heath swamps on coastal sandstone plateaus of the Sydney basin	High condition
PCT 1292 – Water Gum – Coachwood riparian scrub along sandstone streams, Sydney Basin Bioregion	High condition
PCT 1250 – Sydney Peppermint – Smooth-barked Apple – Red Bloodwood shrubby open forest on slopes of moist sandstone gullies, eastern Sydney Basin Bioregion	High condition
PCT 1127 – Sandstone cliff-face soak of the Sydney Basin Bioregion	High condition

Table 4.1 NWMP Plant Community Types and Condition

PCT	Condition
PCT 1083 – Red Bloodwood – scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion	High condition
PCT 878 Gully Gum – Sydney Peppermint – Yellow Stringybark moist open forest of coastal escarpments, southern Sydney Basin Bioregion	High condition

The PCTs mapped within the proposed disturbance area at the WWC pit top area are detailed in **Table 4.2** and shown in **Figure 4.2**.

Table 4.2 Pit Top Disturbance Area PCTs

PCT	Condition
PCT 906 – Lilly Pilly – Sassafras – Stinging Tree subtropical/warm temperate rainforest on moist fertile lowlands, southern Sydney Basin Bioregion	The vegetation community was recorded in a moderate condition with native species represented within all strata with weed ingress in the understorey and areas of high Lantana infestation.
PCT 1245 – Sydney Blue Gum x Bangalay – Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion	The vegetation community was recorded in a low condition as result of the reduced species diversity recorded within all documented strata. This is supported by the historical evidence of tree removal, vegetation clearing and maintenance under scrubbing of mid storey vegetation resulting in the high incidence of exotic flora.

Two of the PCTs have been identified as either threatened or endangered ecological communities being:

- PCT 1804 recorded within the proposed extension of the NWMD meets the listing for the threatened ecological community (TEC) Coastal Upland Swamp in the Sydney Basin Bioregion, which is listed as endangered under both the *Biodiversity Conservation Act 2016* (BC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- PCT 906, identified in the WWC pit top disturbance area and subject land, currently meets the listing for Illawarra Subtropical Rainforest in the Sydney Basin Bioregion, which is an endangered ecological community (EEC) under the BC Act.

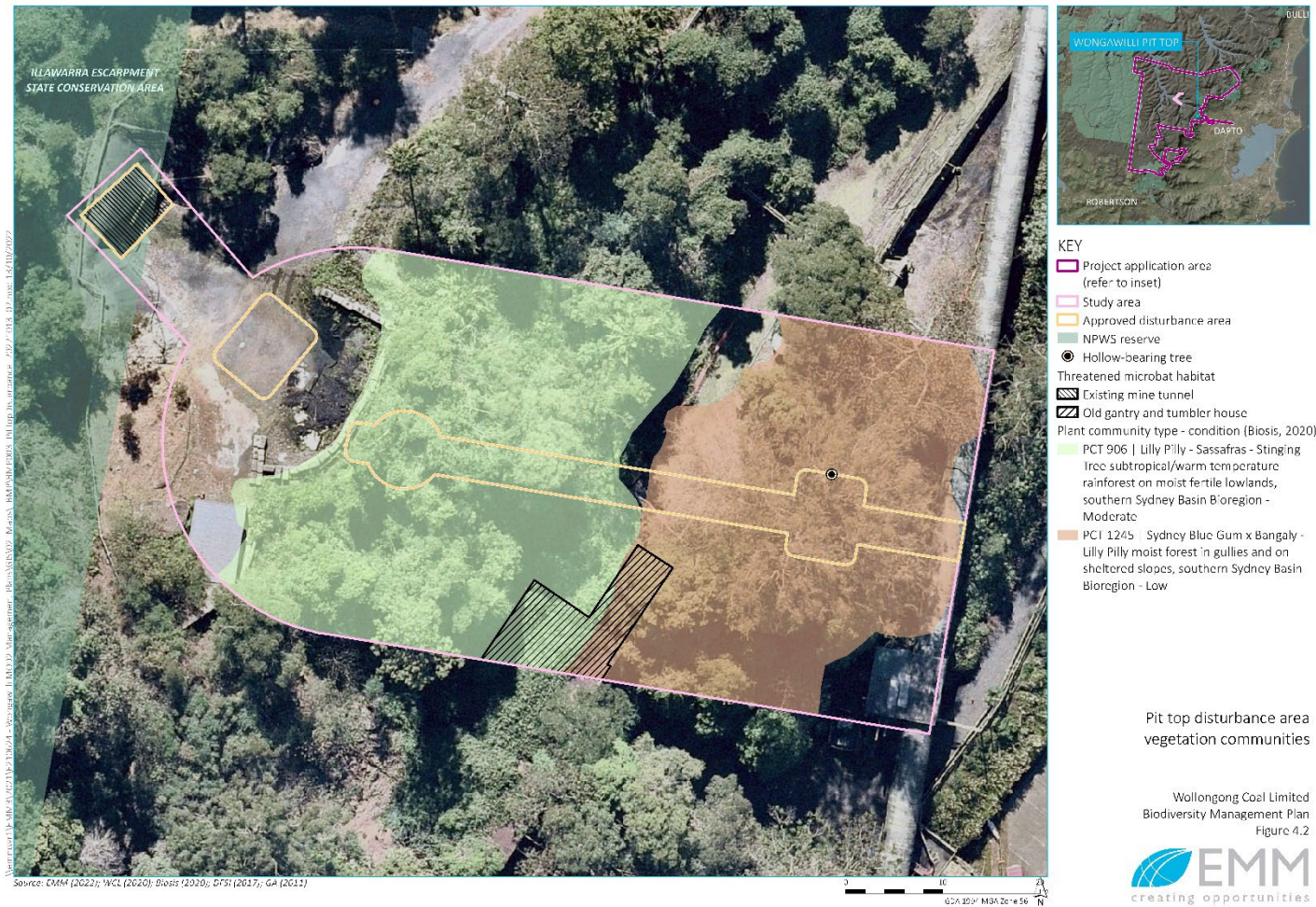
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Figure 4.1 NWMD Vegetation Communities



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Figure 4.2 Pit Top Disturbance Area Vegetation Communities and Habitat Areas



4.3 Groundwater

The main groundwater units in the area include:

- **Quaternary Upland Swamps** - saturated alluvial/colluvial sediments and organic matter. Recharged from rainfall as well as surface/subsurface water flow.
- **Tertiary Cordeaux Crinanite** – present in the Nebo area of the Colliery and has similar characteristics to dolerite intrusions.
- **Triassic Hawkesbury Sandstone** - main groundwater source and widely accessed for groundwater supply regionally and provides baseflow contributions where incised along major rivers (i.e. Cataract and Nepean Rivers). Groundwater flow is northward, and locally influenced where intersected by rivers and private abstraction bores. Current monitoring data indicates no depressurisation or drawdown within the Hawkesbury Sandstone in response to mining.
- **Triassic Narrabeen Group** – sandstone interbedded with low permeability claystones that generally act as aquitards. Recharge to the Narrabeen Group is from water storage areas where intersected, infiltration of rainfall along the escarpment and downward seepage from overlying Hawkesbury Sandstone.
- **Permian Illawarra Coal Measures** – with groundwater occurrence largely associated with the more permeable coal seams, with confined groundwater conditions. Groundwater flow generally northward, and locally depressurised due to current and historical mining. Current monitoring shows depressurisation from historical operations, with recovery in levels in localised areas, potentially influenced by underground water storage.

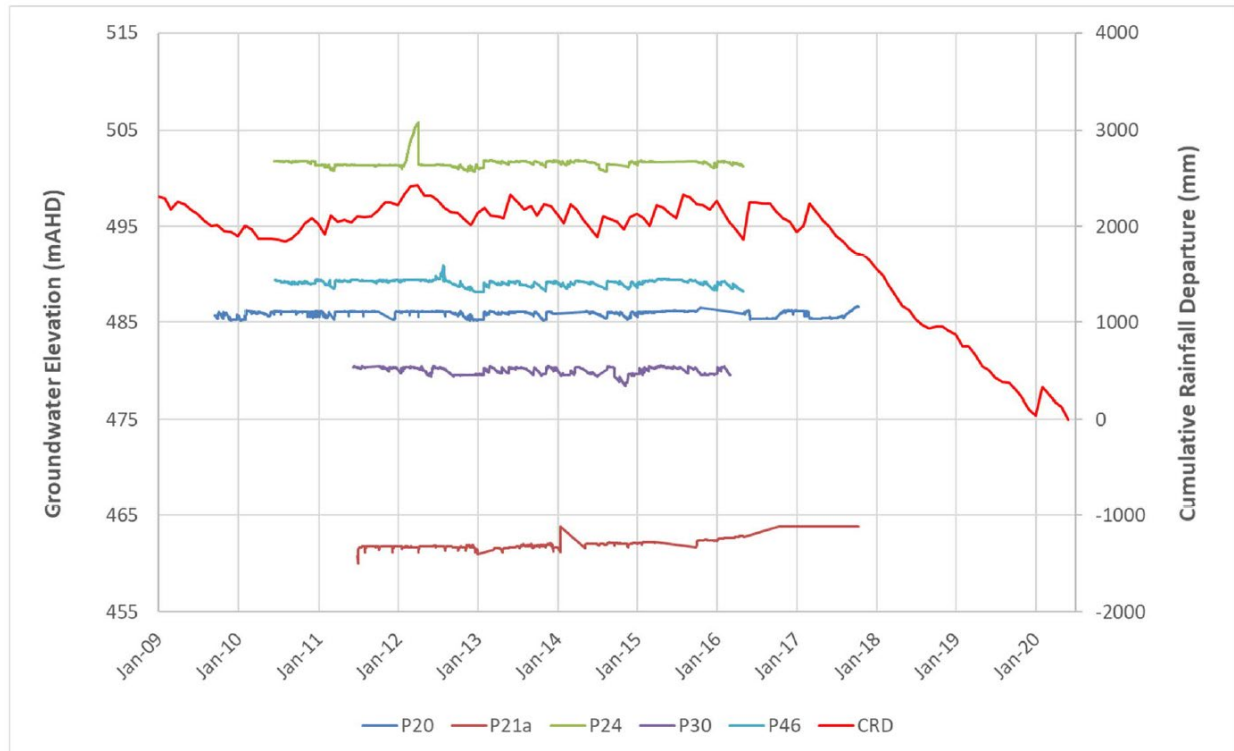
4.3.1 Quaternary Upland Swamps

Minor occurrences of upland swamps are mapped throughout the project area; whereby these features are typically deposited in the direction of surface water flow. These deposits typically comprise a shallow organic horizon, underlain by sandy loam soils derived from weathered Hawkesbury Sandstone.

Recharge to the upland swamp deposits occurs directly through rainfall, and indirectly through run off. Discharge can either take place vertically to underlying geological units, or as river baseflow where positive hydraulic gradients allow flow into rivers or streams.

There are no existing swamp monitoring bores in the NWMD area alignment, but there are five swamp monitoring points (P20, P21a, P24, P30 and P46) above the Wongawilli 1 workings around 1.2 km north-east. Water levels within the swamps were monitored between 2009 and 2018 (see **Figure 4.3**), which shows that these swamp alluvial groundwater levels are generally within 1 m below surface and groundwater level trends correlate with climate trends.

Figure 4.3 Swamp Alluvial Groundwater Levels



4.4 Groundwater Dependent Ecosystems

Groundwater Dependent Ecosystems (GDEs) have been mapped within the area (**Figure 4.4**). Coastal upland swamps are the primary GDE, as they are hydraulically connected to underlying weathered Hawkesbury Sandstone. These swamps are listed as an EEC under the EPBC Act and the BC Act.

Groundwater recharge is primarily through rainfall and indirectly through surface/subsurface flow, whereby longer-term trends are typically influenced by climatic conditions.

Upland swamps 22 and 39 are located in the Nebo mining area in proximity to historical mining areas. Outcomes of pre mining investigations of these two swamps are summarised below

Upland Swamp 22 was in very good condition. During the period of survey, the swamp was damp to wet in some parts and the vegetation was intact and little disturbed. Threatened species observed in this swamp include Giant Dragonfly, listed as endangered under the BC Act and endangered under the EPBC Act. Other species vulnerable to subsidence recorded in this swamp include Southern Emu-wren and Beautiful Firetail. The swamp provides suitable foraging and breeding habitat for Red-crowned Toadlet, Giant Burrowing Frog and possibly also for Littlejohn's Tree Frog. None of the threatened frog species were recorded during the survey period, although it is probable that they occur within the swamp.

Upland Swamp 39 was observed to contain very dry soils and no surface water throughout the swamp area. Sandy areas occurring along drainage lines were noted to show signs of recent erosion. Colonisation of drainage lines within the swamp by young Eucalyptus spp. saplings between five and ten years of age suggests that the swamp has been altered in some way to allow for the colonisation of terrestrial plants in what was once a swamp environment. The swamp habitat was suitable for the presence of Red-crowned Toadlet and Giant Burrowing

Frog. However, the swamp itself was already very dry and did not appear to provide any permanent streams that would be affected by the proposed action. The duration of breeding ponds likely to occur within this swamp is likely to be short, due to the swamp already being dry and does not appear capable of retaining large quantities of water.

4.5 Habitat

4.5.1 Pit Top Disturbance Area

The area of land to be impacted by the construction activities at the WWC pit top area contains rainforest vegetation with areas of dense understorey that could provide potential foraging habitat for Pink Robin (Vulnerable, BC Act). This species is highly mobile and as such, there is a possibility that it could occur within the area of land to be impacted by construction works.

The field investigation undertaken as part of the MOD 2 environmental assessment identified only one hollow-bearing tree (150.741733, -34.472822) (Figure 4.2), containing one medium-sized hollow (5-15 centimetres) located at five metres above ground level. The field investigations confirmed:

- the area lacked large hollows that would be suitable habitat for roosting owls or larger mammals;
- there was no aquatic habitat present and thus the presence of threatened frog species was considered unlikely; and
- no banksias, bottlebrushes or other high quality feed species were recorded within the disturbance area that might provide foraging habitat for mammals.

Background searches identified 67 threatened fauna species recorded or predicted to occur within 10 km of the disturbance area. Those species considered most likely to use hollow-bearing trees as habitat, based on the background research, are as follows:

- Eastern Coastal Free-tailed Bat *Micronomus norfolkensis* (Vulnerable, BC Act);
- Eastern False Pipistrelle *Falsistrellus tasmaniensis* (Vulnerable, BC Act);
- Eastern Pygmy-possum *Cercartetus nanus* (Vulnerable, BC Act);
- Gang-gang Cockatoo *Callocephalon fimbriatum* (Endangered, EPBC Act and Vulnerable, BC Act);
- Greater Broad-nosed Bat *Scoteanax rueppellii* (Vulnerable, BC Act);
- Greater Glider *Petauroides volans* (Vulnerable, EPBC Act);
- Little Bent-winged Bat *Miniopterus australis* (Vulnerable, BC Act);
- Southern Myotis *Myotis macropus* (Vulnerable, BC Act);
- Squirrel Glider *Petaurus norfolcensis* (Vulnerable, BC Act); and
- Yellow-bellied Sheath-tail-bat *Saccolaimus flaviventris* (Vulnerable, BC Act).

Due to the requirement of large or extra-large hollow sizes for habitat, the following species were not considered likely to utilise the identified hollow as habitat:

- Masked Owl *Tyto novaehollandiae* – Requires hollows greater than 20 cm;
- Powerful Owl *Ninox strenua* – Requires hollows greater than 20 cm;
- Sooty Owl *Tyto tenebricosa* – Requires hollows greater than 20 cm.; and
- Glossy Black-Cockatoo *Calyptorhynchus lathami* – Requires hollows greater than 15 cm.

Two human-made structures that could provide potential roosting or breeding habitat for threatened microbat species were recorded within 100 m of the proposed construction works. These are the old gantry and tumbler house, and the existing mine tunnel entrance (refer **Figure 4.2**). Several microbat species have previously been recorded utilising these structures, including the threatened Large Bent-winged Bat (Vulnerable, BC Act). The structures may also provide breeding and roosting habitat for Large-eared Pied Bat (Vulnerable, BC Act and EPBC Act) and Little Bent-winged Bat (Vulnerable, BC Act).

4.5.2 North West Mains Development

The area of the NWMD contains several waterways including Lake Avon (part of the fourth order Gallahers Creek), a third order creek in the north, and multiple first order tributaries. These waterways may provide habitat for several threatened species.

Several of the tributaries in the northern section of the NWMD provide potential habitat for Littlejohn's Tree Frog, due to the presence of both slow flowing water and pools with low hanging vegetation. Tributaries and drainage lines below sandstone ridges may provide habitat for Red-crowned Toadlet within the study area, and pools within the multiple first order streams may provide habitat for Giant Burrowing Frog.

Southern Myotis is likely to occur within the study area due to the presence of multiple waterways for foraging as well as abundant hollows and good condition vegetation. Other fauna that may use the waterways within the area for foraging include Eastern Osprey, White-bellied Sea Eagle and Black Bittern.

While some species rely directly on waterways as habitat for foraging or breeding, many other species rely on aquatic habitat features more indirectly, for example through the presence of groundwater.

No fish community status mapping or indicative threatened fish species mapping is located along the mapped tributaries of Lake Avon within the proposed extension of NWMD area. These streams are not considered to support suitable habitats for threatened fish species given their high slope, small size, and more limited connectivity. These tributaries do, however, support habitats for non-threatened aquatic species.

4.6 Weeds

Vegetation within the WWC pit top area is disturbed, and contains several weed species including Crofton Weed, Cape Ivy, Lantana, Pellitory and Madeira Winter Cherry. Lantana is listed as a priority weed under the *Biosecurity Act 2015* (Biosecurity Act) for the Greater Sydney Local Land Services (LLS) region, which includes the Wollongong LGA. To prevent biosecurity impacts from occurring due to the presence of this listed priority weed within the area, all practical steps should be taken to control and eradicate the weeds from the area.

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4.7 Pests

The area surrounding the WWC pit top supports several pest animal species including Red Fox (*Vulpes vulpes*), Feral cats (*Felis catus*) and several species of deer. The presence of feral deer surrounding the WWC are causing significant damage to native vegetation.

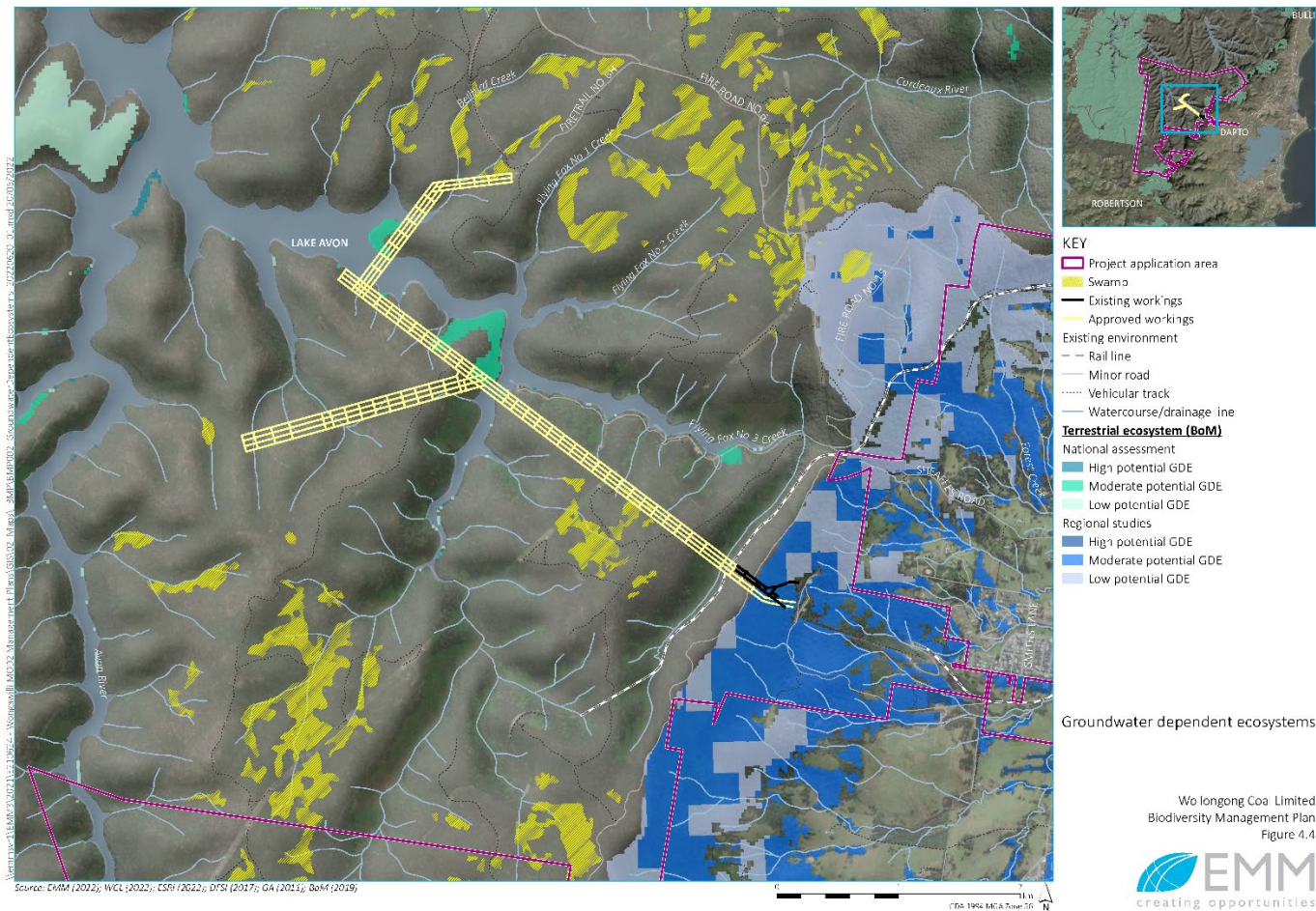
4.8 General

Additional details regarding the existing biodiversity environment surrounding the WWC operations is provided in the WWC Biodiversity Development Assessment Report (BDAR) which is available as Appendix L of the Modification Report for the MOD 2 application at the DPE Major Projects website:

- <https://www.planningportal.nsw.gov.au/major-projects/projects/mod-2-north-west-mains-development>.

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Figure 4.4 Mapped Groundwater Dependent Ecosystems



5 PERFORMANCE CRITERIA

Condition 1, Schedule 3 of PA 09_0161 requires WCL to ensure that subsidence does not cause any exceedances of the performance measures identified in **Table 5.1**.

Table 5.1 Biodiversity Performance Criteria

Aspect	Performance measure
Threatened species, threatened populations, or endangered ecological communities	Negligible environmental consequences
Upland Swamps (No 22 and No 39)	Negligible environmental consequences including: • negligible change in the size of swamps; • negligible change in the functioning of swamps; • negligible change to the composition or distribution of species within swamps; and • negligible drainage of water from swamps, or redistribution of water within swamps.

In addition to the above, WWC has established the following performance criteria relevant to the WWC operations.

Table 5.2 Biodiversity Performance Criteria

Aspect	Performance measure
Microbats	Negligible impacts to microbats and their habitats as a result of construction and operations
Mining impacts to biodiversity	Negligible impacts to biodiversity values as a result of mining related impacts to the surface
Surface disturbance	No surface disturbance beyond assessed and approved areas.
Erosion from construction activities	Negligible impacts to biodiversity as a result of erosion and sedimentation from construction activities

6 MONITORING PROGRAM

6.1 Subsidence and Terrestrial Ecology

Up until 15 March 2019, WCL was extracting longwall coal from remanent coal reserves in the Nebo Domain of the mine under both a Subsidence Management Plan (SMP) for longwalls 11, 12, 15, 16, 19 & PE1 and an Extraction Plan for longwalls N1- N6. Mining has ceased in these areas and will no longer be undertaken.

A terrestrial ecology monitoring program focussing on riparian vegetation and amphibians was implemented in the Nebo mining area since 2010. The aim of this monitoring program was to establish baseline conditions to enable the identification of any impacts from mining on the terrestrial ecology of the area. The monitoring program formed a component of the previously approved Subsidence Management Plan (SMP) and Extraction Plan with the results reported in the WWC Annual Review.

The monitoring program was required to be implemented for one year post mining. With extraction of longwall panels within the Nebo area being completed in 2019, the Autumn 2020 monitoring event represented the last monitoring event of the program. No further terrestrial monitoring for historical mining areas is proposed.

Future mining following determination of MOD 2 involves the development of roadways using first workings. No secondary extraction is proposed.

In accordance with Schedule 3 Condition 6B, a Subsidence Monitoring Program will be developed for these first workings to

- provide for the collection of sufficient baseline data;
- provide data to assist with the management of the risks associated with subsidence; and
- validate the subsidence predictions;

All mining following the determination of MOD 2 will be undertaken to ensure that mining does not cause greater than 20 millimetres (mm) of vertical subsidence at the ground surface.

Given the low levels of subsidence predicted from the approved mining activities, no impacts to biodiversity are anticipated. Regular surface inspections above the NWMD mining areas will be undertaken to identify subsidence related impacts such as surface cracking or areas of increased erosion as a result of mining operations and the potential impacts to biodiversity. Surface inspections will focus on accessible areas and key sensitive features including any caves, overhangs or cliffs. Any impacts (e.g. cracking, rock falls or increased erosion) will be recorded and managed in accordance with the Trigger Action Response Plan (TARP) provided as **Section 8**.

6.2 Aquatic Ecology Monitoring

An aquatic ecology monitoring program has been implemented in the Nebo mining area of the WWC since 2015. The aim of the monitoring program is to establish baseline conditions that enable the identification of any impacts from mining on the aquatic ecology of the area. The monitoring program formed a component of the previously approved SMP and Extraction Plan with the results reported in the WWC Annual Review.

The monitoring program was required to be implemented for one year post mining. With extraction of longwall panels within the Nebo area being completed in 2019, the Autumn 2020 monitoring event represented the last monitoring event of the program. No further aquatic ecology monitoring for historical mining areas is proposed. Given the predicted negligible impacts from mining in the NWMD area, no further aquatic ecology monitoring is proposed.

6.3 Upland Swamp 22 and 39 Monitoring

Monitoring of upland swamps in the Nebo mining area was conducted prior to, during and post mining. Biodiversity monitoring of these upland swamps is detailed in **Table 6.1**.

Table 6.1 Upland swamp 22 and 39 Monitoring Program

Name	Sites	Methods
Vegetation	Three transects (15 m) within each swamp	Record presence of all plant species in 30 consecutive 0.5 m x 0.5 m quadrats

Table 6.1 Upland swamp 22 and 39 Monitoring Program

Name	Sites	Methods
Frogs	Three point locations within each swamp, along drainage lines, where possible	50m nocturnal stream searches and tadpole surveys or 25 m x 25 m quadrat where there is no apparent drainage line, for 30 min
Photo-point monitoring	Photos taken from a fixed view angle from routine monitoring sites.	

These upland swamps were beyond a 35° angle of draw of the Nebo mining area longwall panels N1 and N5. Monitoring concluded that there were no observable changes to frog populations and vegetation composition to these swamps as a result of mining activities. No further biodiversity monitoring of these two upland swamps is proposed

6.4 Upland Swamps - NWMD

Two upland swamps have been mapped within the NWMD area, including one swamp area above the proposed extension to the NWMD and another one above the already approved NWMD (refer **Figure 4.1**). Monitoring of groundwater and soil moisture levels prior to and during mining in the NWMD area will be implemented as detailed in the Water Management Plan.

Baseline biodiversity monitoring of the two upland swamps and a control swamp will use the Brownstein et al (2014) transect methodology seasonally for at least 12 months prior to mining within 400 m of the swamp to establish seasonal variation. The number of transects set up per swamp to collect baseline data should be proportional to swamp area to ensure representative sampling of vegetation across the whole swamp. A minimum of three replicate transects will be established per swamp. Transect start points will be positioned at or just inside the swamp edge using a stratified random sampling approach (e.g. after dividing the length of the swamp into sections, transect start positions should be located at a random point along the swamp edge, within each section). Transect start points are determined before entering the field to avoid sampling bias. One m x one m quadrats will be positioned along the transects at a sampling interval of approximately one quadrat per four m.

Transect start and endpoints will be marked in the field with both stakes and waypoints during the site set-up to ensure comparable data can be collected. A compass bearing should be recorded from the start point and used for future reference. Quadrats should be placed slightly offset of the walked transect to avoid disturbance.

Should groundwater levels fall below trigger levels (as detailed in the Water Management Plan) and persist for more than two months the transect and quadrat floristic sampling will recommence and be undertaken seasonally until either ground water levels recover or until agreed to with BCS and DPE.

6.5 Microbat Monitoring

6.5.1 Mine Tunnel Entrance

Prior to the commencement of construction activities and the installation of microbat exclusion measures (detailed in **Section 6.4.3**) nocturnal monitoring of roost activity will be undertaken by a suitably qualified ecologist to confirm microbats are leaving the roost to forage. Nocturnal

monitoring will be undertaken on at least two separate occasions prior to the installation of exclusion measures.

6.5.2 Old Gantry and Tumbler House

If construction activities are occurring during the winter torpor period (mid-May to August), fortnightly monitoring of bats potentially roosting in the Old Gantry and Tumbler house during the winter torpor period will be undertaken to identify if any bats are utilising the Old Gantry and Tumbler house and ensure they are not being impacted. A suitably qualified ecologist will be engaged to undertake this monitoring.

6.6 Weed Monitoring

Weed infestation monitoring within the surface mining lease area of the WWC pit top is undertaken on an ongoing basis.

As part of WCL's ongoing weed management program, WWC will implement an annual weed survey of vegetation within the surface mining lease area of the pit top and develop an annual weed monitoring and management program to identify weed infestations and monitor the effectiveness of the weed control program over time. A detailed weed management program will be developed by WCL in 2022 for implementation in 2023 with targets for weed management that are specific, measurable, achievable, realistic, and timely.

6.7 Pest Monitoring

A pest monitoring and control program is proposed to be developed and implemented at the WWC across the surface mining lease area of the WWC pit top in consultation with surrounding landowners and LLS. The pest monitoring and control program will be developed in 2022 and implemented from 2023 with targets for pest management that are specific, measurable, achievable, realistic, and timely. The monitoring and control program will focus on deer, but may also include the red fox, rabbits, and feral cats.

6.8 Asset Protection Zones

Monitoring of Asset Protection Zones (APZs) within the mining lease areas will take place annually and prior to the commencement of the bushfire season. Inspections will be conducted by WCL or a suitably qualified contractor in accordance with the Bushfire Management Plan provided as **Appendix A**.

7 MANAGEMENT AND MITIGATION

7.1 Subsidence

Any historical subsidence monitoring will continue to be undertaken in accordance with the requirements of the previously approved SMPs and Extraction Plans.

For future mining undertaken following the approval of MOD 2, a detailed subsidence monitoring program has been prepared in accordance with the requirements of Schedule 3 Condition 6B of the Project Approval. Additionally, a TARP has been developed and provided in **Section 8** to address the steps that will be taken should subsidence related impacts be identified

(surface cracking, rock falls or areas of increased erosion) during regular surface inspections of the NWMD mining area.

7.2 Terrestrial Ecology

No vegetation is to be removed from the area within the proposed extension of NWMD. Monitoring of terrestrial ecology in the NWMD area will be limited to monthly surface inspections during mining to identify potential impacts to threatened species or ecological communities as a result of subsidence.

7.2.1 Microbats

To manage ongoing operational impacts from the proposed new conveyor on the microbat habitat of the Old Gantry and Tumbler House, permanent noise barriers will be constructed between the conveyor and the microbat structure, to minimise noise or vibration disturbance to resident microbats.

The Old Gantry and Tumbler House structure will be designated as a permanent no-go-zone to avoid disturbance to microbats from increased foot traffic in the vicinity. Signage such as 'No Go Zone' or 'Environmental Protection Area' will be installed prior to the commencement of construction activities. Any permanent lighting required for operation of the proposed conveyor will be designed to be directed away from, and avoid light spill into, retained adjacent vegetation and the adjacent Old Gantry and Tumbler House, which provides roosting habitat for microbats.

7.3 Surface Disturbance

All vegetation clearing must be undertaken within the approved project boundaries and in accordance with relevant approvals. Any clearing which is required to occur outside of the approved areas must undergo an additional assessment of potential impacts and be approved where necessary.

Exclusion fencing around trees and vegetation to be retained will be installed with signage to minimise the risk of inadvertent impacts to surrounding vegetation. Tree protection measures generally in accordance with Australian Standard 4970-2009 Protection of Trees on Development Sites, will be implemented.

Vegetation clearing will be undertaken in accordance with the procedures detailed below.

Pre-Clearing Surveys

Pre-clearing surveys will be undertaken prior to any vegetation clearing. Pre-clearing surveys will be undertaken by a suitably qualified and experienced ecologist and will be undertaken to identify habitat trees to be retained and significant tree limbs (where possible). Hollow logs and rock habitat within the clearance areas will be retained and carefully placed into the adjacent bushland.

Stage 1 Clearing and Grubbing

All vegetation, excluding marked habitat trees/features, will be removed during Stage 1 clearing works. Traditional methods for clearing will be employed using dozers and loaders where possible. Excavators may be used to grab large tree trunks, with the remaining holes filled and compacted.

An Ecologist will be available on a standby basis to inspect the site and capture/relocate any identified animals. Following clearing, if required, the Ecologist will relocate/ treat any injured or

remaining animals. Suitable habitat trees and litter collected during clearing and grubbing will be stockpiled for later placement on rehabilitation areas to provide microhabitat opportunities for ground dwelling fauna to return to re-vegetated areas. Storage of vegetation stockpiles will be within existing cleared areas.

Stage 2 Clearing

All habitat trees/features marked for retention during the Pre-Clearing Survey will be removed during Stage 2 clearing operations, which may only commence 48 hours after the initial (Stage 1) clearing operations. Where hollow-bearing trees are to be removed, the operation will be performed by mechanically shaking or agitating the tree to encourage any remaining animals to either leave the tree, or at least show themselves and possibly be removed, prior to felling. Felling will involve gently pushing the tree and lowering to avoid sudden falling as this is likely to injure wildlife. Subsequent to felling, habitat trees will be systematically checked for any remaining fauna. Felled habitat trees will be left for a short period to allow any undetected fauna further opportunity to escape.

Felled trees will be added to vegetation stockpiles for later re-use to provide habitat in rehabilitation areas. If any habitat tree is found or suspected (based on fresh tree markings or scats) to contain any threat-listed species, the tree will be left in place for a minimum of two days and, if possible, be reinspected prior to felling.

If hollow-bearing trees are found to contain nestlings or juveniles prior to felling, it will be preferable to leave trees intact until such a time that juveniles have vacated the nest or den. If, however, Project timing does not permit this, a local wildlife organisation will be engaged to rescue juveniles for possible captive rearing and subsequent release into translocation sites. The success of this will depend upon the species, their stage of development and their likely chances of survival.

If arboreal animals do not move or they cannot be captured because the tree hollow is too large or high, or its recovery would breach occupational health and safety requirements, then the tree will be felled, and animals recovered post-felling.

After the completion of fauna relocation, a brief record detailing the findings of the survey and relocation will be prepared by the supervising Ecologist, including details of:

- any live animals that are sighted, captured, released, injured, shocked, or killed as a result of clearing operations and fauna rescue; and
- tree species being used for breeding or roosting by fauna, including tree locations, sizes, heights and depths of hollows.

Post-Felling Inspection and Relocation of Retained Habitat Features

Following completion of Stage 2 clearing the Project Manager will complete a final inspection of the area to confirm that it has been cleared. Any stockpiled habitat features will then be relocated to long-term stockpiling areas within already cleared areas, for use during site rehabilitation. Timber material that is unsuitable for habitat reuse will be mulched and chipped for on-site re-use in rehabilitation.

7.3.1 Hollow Bearing Trees

As identified in **Section 4** the field investigation undertaken as part of the MOD 2 environmental assessment identified only one, medium sized, hollow-bearing tree within the disturbance footprint.

The optimal period of impact avoidance has been assessed for the ten species identified as having a medium or greater likelihood of using the hollow for nesting or roosting (**Table 7.1**). The assessment found that the period from April to September will impact the least number of species during key periods of breeding and roosting. To account for the winter roosting and torpor period for the threatened microbat species, tree removal should be restricted to April to May or September.

Table 7.1 Hollow Bearing Tree - Optimal Removal Periods To Avoid Impacts

Threatened species	Optimal period of impact avoidance	Justification of impact avoidance
Eastern Coastal Free-tailed Bat <i>Myotis norfolkensis</i>	No data available	No breeding or roosting periods have been listed for this species, however the common winter roost period for microbats has been considered in the final determination.
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>	February to September	The Eastern False Pipistrelle roosts in the winter months, with females pregnant in late spring to early summer. Birthing period will take precedence over the winter roost which will be considered for all microbat species.
Eastern Pygmy-possum <i>Cercartetus nanus</i>	April to September	Most births occur between late spring and early autumn for the Eastern Pygmy-possum.
Gang-gang Cockatoo <i>Callocephalon fimbriatum</i>	February to September	The breeding season for the Gang-gang Cockatoo occurred between October and January. Impacts to Hollow-bearing trees should occur outside this time period.
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>	March to November	A key threat to the greater Broad-nosed Bat is disturbance to roosting and summer breeding sites with offspring often born in January. Birthing period will take precedence over the winter roost which will be considered for all microbat species.
Greater Glider <i>Petauroides volans</i>	July to February	Female Greater Gliders give birth to a single young from March to June. Impacts to Hollow-bearing trees should occur outside this time period.
Little Bent-winged Bat <i>Miniopterus australis</i>	February to August	Maternity colonies for the Little Bent-winged Bat form in spring and birthing occurs in early summer.
Southern Myotis <i>Myotis macropus</i>	April to September	Birthing period for the Southern Myotis occurs in November and December, with more active movement and foraging occurring between October to March.

Table 7.1 Hollow Bearing Tree - Optimal Removal Periods To Avoid Impacts

Threatened species	Optimal period of impact avoidance	Justification of impact avoidance
Squirrel Glider <i>Petaurus norfolcensis</i>	No data available	No breeding periods have been listed for this species, however BioNet suggests a retracted survey period between March and August, which has been considered in the final determination.
Yellow-bellied Sheath-tail-bat <i>Saccolaimus flaviventris</i>	April to November	Breeding has been recorded from December to mid-March.

Removal of the hollow bearing tree will be undertaken within the optimal periods identified above to avoid impacts to potential threatened species. Removal of the hollow bearing tree will be supervised by a suitably qualified ecologist and placed in the area of retained vegetation to provide additional fauna habitat. The location of the hollow bearing tree and significant tree limbs will be marked out during the pre-clearance surveys with GPS coordinates of all hollow bearing trees and significant tree limbs provided to the site Environment Superintendent.

7.4 Weed Management

Since late 2017 WCL has been conducting its own weed management activities at WWC. A combination of physical control and spraying has been undertaken at the Wongawilli pit top and is ongoing.

An infestation of lantana was identified during the environmental assessment for the MOD 2 environmental assessment adjacent to the proposed disturbance area for the construction activities addressed in **Figure 7.1**. This lantana infestation will be removed prior to or during the clearing activities undertaken on site for the construction of additional infrastructure.

An ongoing weed control program will be implemented within the surface mining lease area of the pit top to assist vegetation resilience and quality. Weed management will focus on targeting those weeds listed as a priority weed under the Biosecurity Act.

Herbicide is considered appropriate for larger weed species and areas of large infestation containing few natives. The application of herbicides for weeding purposes will only be applied by competent personnel with experience in bush regeneration and will be kept to a minimum. Particular caution will be used when applying herbicides around waterways and environmentally sensitive areas, particularly aquatic environments, to ensure chemicals do not contaminate waterways or sensitive habitats. Where chemical usage is unavoidable environmentally friendly herbicides will be utilised.

In sensitive environments such as heavily forested areas, threatened ecological communities and in sparse weed infestations manual removal of herbaceous weeds, regrowth and seedlings is the preferred method of weed management. If intensive weeding is required, the soil as far as practical will be stabilised.

Disposal of removed weed matter is particularly important and offsite disposal or destruction at a suitable facility is essential. All weeds removed from site will be disposed of appropriately.

Weed removal works will be undertaken outside the seeding period of the target weeds, particularly weeds which produce large quantities of seed. Generally, the most effective time for undertaking weed management activities is during Spring when majority of weed species are undertaking new growth and flowering.

During construction activities on site, contractors will ensure good hygiene practices are used to reduce the risk of spreading weeds including ensuring that all machinery, materials and personnel are clean of any weed seed (refer **Section 7.7**).

7.5 Pest Control

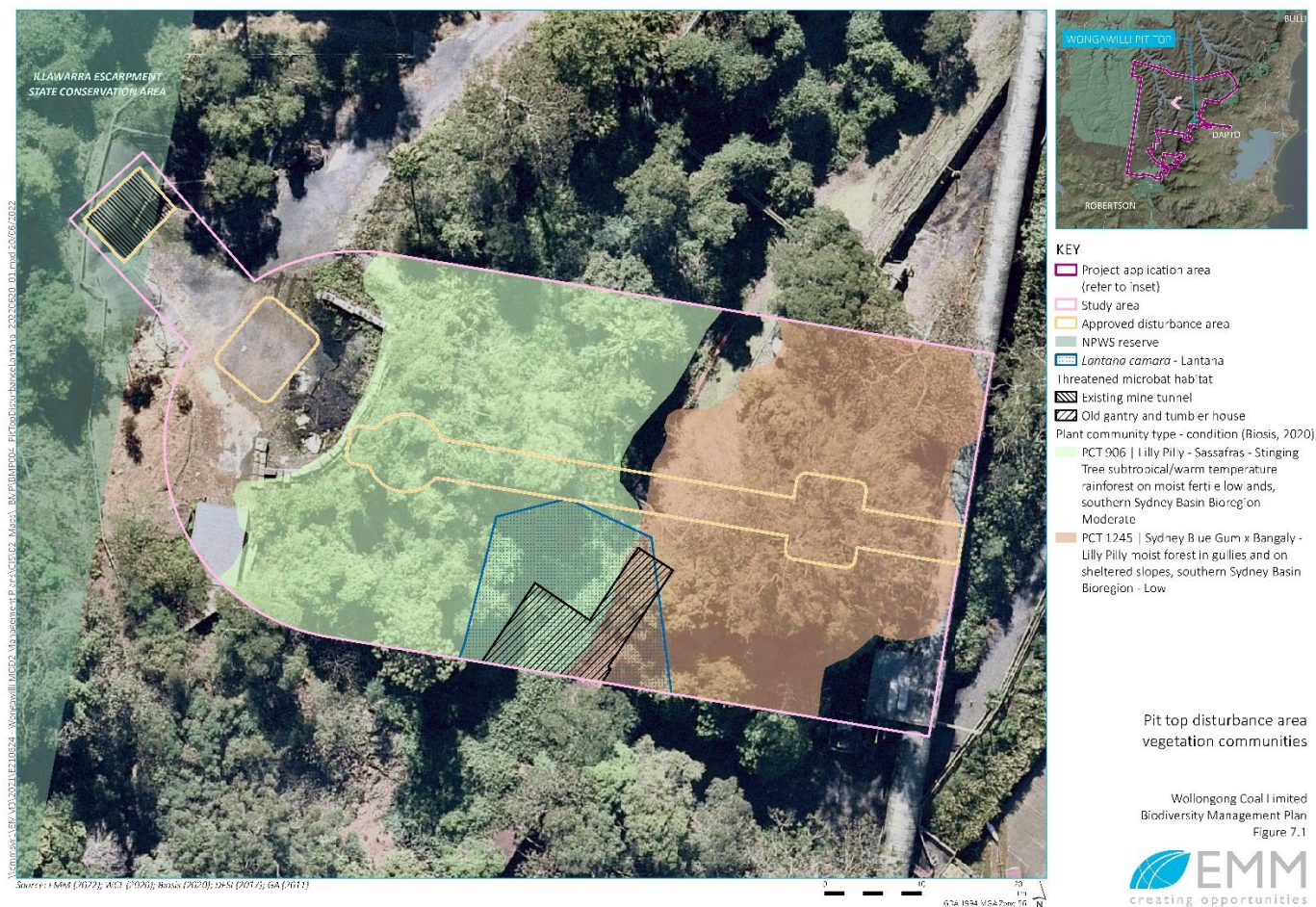
In 2022, WCL will review the pest control program undertaken on site and develop a comprehensive program to incorporate control measures for deer, the red fox, rabbits, and feral cats in consultation with surrounding landowners, NPWS and Local Land Service. An annual pest control program will be developed and implemented to reduce the impact of pest species on the surrounding ecology of the area.

To control feral species, several management techniques must be employed over an extended period. Typical management actions that will be implemented for pest species on WCL managed land may include, but are not limited to:

- shooting of feral deer;
- destruction of rabbit warrens; and
- trapping and removal of feral cats.

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Figure 7.1 Lantana Removal Target Area



7.6 Bushfire Management

WCL has developed a Bushfire Management Plan to manage and maintain the integrity of surrounding resources and to ensure the protection of life, property, environment, and local community at the WWC from bushfire impacts. The Bushfire Management Plan is provided as **Appendix A** and includes:

- slashing landscape vegetation to manage fuel;
- maintenance of fire breaks;
- ongoing communication with the NSW Rural Fire Service; and
- site firefighting equipment and emergency response procedures.

7.7 Pathogen Management

Major pathogens considered to require management for the construction activities are soilborne disease (Phytophthora) and myrtle rust (Pucciniales). Both pathogens are listed as key threatening processes under the BC Act. Occurrences of pathogens (e.g. Myrtle Rust and Phytophthora) will be reported, treated and monitored.

Amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) is a fungal pathogen that causes the disease chytridiomycosis, which has led to the decline and extinction of frog populations globally and in Australia. Chytridiomycosis has been detected in over 40 species of native Australian frogs. The fungus is transferred by direct contact between frogs and tadpoles or via zoospores in infected water. Humans can spread the disease by contaminated footwear and equipment and by (illegally) moving frogs from one area to another.

WCL will ensure contractors used on site for construction activities use good hygiene practices to reduce the risk of spreading pathogens, including ensuring that all machinery, materials and personnel are clean of any soil and organic material.

Basic hygiene protocol for personnel, clothing, footwear, tools and equipment are detailed below and consistent with the NSW Department of Planning, Industry and Environment Saving our Species Hygiene Guidelines (2020).

Check

Check personnel, clothing, footwear, backpacks and equipment for soil, plant material/propagules, water, organic materials and other debris.

Clean

Remove all soil, plant material, water, organic material, and other debris using a hard brush and (if required) clean water. If dirty, wash hands with soap and water¹.

Remove seeds from clothing, footwear, tools and equipment by hand. Seeds that are difficult to remove can sometimes be scraped off clothing with a sharp implement (e.g. a knife), but use caution. Where possible, have a co-worker double-check that you have removed all seeds.

Disinfect

If necessary, spray or soak potentially contaminated materials with disinfectant. Leave for 30 seconds before proceeding. Where practical, rinse with clean water

Dry

Where practical, ensure hands, clothing, footwear, and equipment are dry before proceeding.

A check of basic hygiene practices will form a component of pre work checklists to be completed by the contractors and WCL Project Manager prior to commencing construction activities on site.

7.8 Construction Activities

A Construction Environment Management Plan (CEMP) will be developed and implemented specific to the construction activities carried out at the Wongawilli pit top. Several management and mitigation measures will be implemented during the construction phase of the project that will be incorporated into the CEMP to manage the potential for impact on surrounding vegetation, threatened fauna and their habitats. Specific measures to be taken during construction activities are detailed below.

7.8.1 Erosion and Sediment Control

Erosion and sediment control is undertaken to minimise excessive soil loss cover and protect adjacent vegetation and waterways from activities requiring the disturbance of existing ground. WCL has developed a detailed erosion and sediment control plan which forms a component of the Water Management Plan.

Protection of vegetation adjacent to the proposed disturbance areas at the Wongawilli pit top will be achieved during clearing and construction activities through implementation of erosion and sediment control measures. The design, installation and maintenance of erosion and sediment controls will be done in accordance with relevant guidelines. Site specific erosion and sediment controls for the construction activities will be incorporated into the CEMP.

Generally, erosion and sediment control measures will include:

- minimising the extent and duration of soil disturbance;
- controlling water movement through the site;
- promptly stabilising disturbed areas;
- maximising sediment and contaminated water retention on site;
- maintaining all drainage, erosion, and sediment control measures in proper working order at all times; and
- monitoring and adjusting drainage and erosion and sediment control practices to maintain the required performance standards.

Where site access permits, erosion and sediment control structures will be installed/constructed prior to the commencement of site clearing/ground disturbing activities. In situations where some preliminary clearing is required to gain access, the required erosion and sediment control structures will be installed/constructed as a matter of priority. Specific erosion and sediment control measures to be implemented during construction activities will be detailed within the CEMP.

Sediment fences will be inspected prior to the commencement of construction activities by a suitably qualified practitioner (e.g. a certified professional in erosion and sediment control) with weekly inspections and inspections immediately after rainfall undertaken to ensure erosion and sediment fences remain intact and effective.

7.8.2 Microbats

Old Gantry and Tumbler House

Temporary noise barriers will be installed between the proposed conveyor and the old gantry and tumbler house before the start of construction on the upper bench using temporary fencing with sound blankets. This fencing will not impede the movement of microbats in and out of the structure or ongoing use of the structure.

The structure will be designated as a permanent no-go-zone to avoid disturbance to microbats from increased foot traffic in the vicinity. Signage such as 'No Go Zone' or 'Environmental Protection Area' will be installed.

If, during the course of construction activities, microbats are seen exiting the Old Gantry and Tumbler house, the WWC Environment Superintendent must be contacted immediately, construction activities ceased, and an appropriately qualified ecologist contacted. The building will be inspected to identify if any further bats are roosting in the building and advise on what steps should be taken to minimise further disruption to the microbat habitat. Any recommendations will be implemented.

Mine Tunnel Entrance

To mitigate impacts to microbats inhabiting the mine tunnel entrance, the following measures will be implemented prior to the commencement of construction activities:

- a pre-clearance microbat survey will be undertaken by a suitably qualified ecologist. All areas with the mine tunnel with the potential to support microbat habitat within the existing mine tunnel entrance will be inspected.
- If microbats are found to be present in the existing tunnel entrance during the pre-clearance inspection, but are not likely to be utilising the structure as a maternity roost (i.e. no evidence of pregnant or lactating females), then temporary exclusion measures are to be installed overnight once the bats have left the roost to forage.
- Prior to the installation of exclusion measures, nocturnal monitoring of roost activity is to be undertaken by a qualified ecologist, and bats must be confirmed as leaving the roost to forage on at least two separate occasions as detailed in **Section 5.5**.
- All exclusion measures will be undertaken under the supervision of a qualified ecologist to ensure all microbats have vacated the roost.

If threatened microbats are found to be present in the existing tunnel entrance during the pre-clearance survey, and appear to be in breeding condition (i.e. pregnant or lactating females, presence of young), any use of the tunnel will be immediately postponed and appropriately qualified ecologists will be consulted to determine the most appropriate steps to be taken. The Biodiversity Conservation and Science Directorate (BCSD) will also be notified.

If works and exclusion of roosting bats are required during the overwintering months (mid-May to August), when many culvert roosting bats enter torpor (hibernation state), the following additional safeguards must be adhered to:

- if bats are not confirmed as leaving the roost to forage (i.e. in winter torpor) additional monitoring is to be undertaken until regular foraging has resumed; and
- works are not to impact the tunnel during winter torpor if bats are present.

Exclusion measures will be confirmed sufficient and effective by a qualified ecologist prior to works.

7.8.3 Lighting

Any temporary lighting required during the construction phase will be designed to point down and minimise light spill into retained vegetation.

7.9 Training and Awareness

All WCL employees and contractors will be inducted prior to commencing work on site. The environmental component of the new employee induction will include:

- environmental regulatory requirements;
- roles and responsibilities;
- significant environmental aspects, impacts and consequences; and
- environmental procedures.

In the event that there are specific environmental management requirements relating to a contractor's work activities, details of these requirements will be issued to the contractor in writing as a part of the induction.

In addition to the standard training and inductions for all site personnel and contractors, it will be ensured that any staff that are required to undertake works within the vicinity of the microbat habitat structures are briefed on the importance of minimising disturbance to the Old Gantry and Tumbler House microbat structure and any potential resident microbats. The location of any 'No Go Zones' will be highlighted in site inductions for those staff and contractors involved in the construction works.

Staff and contractors involved in the construction activities will be advised through the induction processes on:

- the importance of minimising impacts to biodiversity values;
- procedures and requirements to contact the Environment Superintended immediately if microbats are seen exiting the Old Gantry and Tumbler House during construction activities; and
- procedures to be implemented should injured wildlife be identified in the work area.

8 TRIGGER ACTION RESPONSE PLAN

Operations at WWC will be managed in accordance with the TARP detailed in **Table 8.1**.

Table 8.1 Subsidence Impact TARP

Trigger level	Trigger	Action and Response	Responsibility
Green level	No mining related impacts to the surface (e.g. surface cracking or increased erosion) during surface inspection	Continue monitoring in accordance with this management plan.	Environment Coordinator
Amber level	Surface inspections identify mining related impacts to the surface that has not caused any impacts to biodiversity values	Implement mitigation and/or remediation measures to ensure the impacts are not exacerbated. AND Implement incident notification in accordance with the procedures detailed in Section 11.1 and submit incident report to DPE, BCS and WaterNSW. AND Complete incident investigation procedures as detailed in Section 10.1 and submit investigation report to DPE, and WaterNSW. AND Implement adaptive management mine design changes (if practical) to ensure the impacts do not re-occur. AND Comply with any directions from DPE.	Environment Coordinator Environment Superintendent Environment Superintendent Mine Manager Environment Superintendent
Red level	Surface inspections identify mining related impacts to the surface that has caused impacts to biodiversity values	Implement mitigation and/or remediation measures to ensure the impacts are not exacerbated. AND Implement incident notification procedures as detailed in Section 11.1 and submit incident notification to DPE, BCS and WaterNSW. AND Contact a suitably qualified ecologist to assess extent of impact to biodiversity values and implement incident investigation procedures as detailed in Section 10.1 and submit investigation report to DPE, BCS and WaterNSW. AND Implement adaptive management mine design changes (if practical) to ensure the impacts do not re-occur. AND Comply with any directions from DPE or BCS.	Environment Coordinator Environment Coordinator Environment Superintendent Mine Manager Environment Superintendent

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Table 8.2 Swamp Water Level TARP

Trigger level	Trigger	Action and Response	Responsibility
Green level	No change in groundwater level variability as defined by criteria in the Water Management Plan.	Continue monitoring in accordance with the Water Management Plan	Environment Coordinator
Amber level	Reduction in groundwater level (at least 0.4 m) which extends for less than two months, or does not persist after significant recharge.	Review change in level with respect to mining position and investigate potential cause of groundwater change. AND If investigations determine change is a result of mining operations, implement adaptive management mine design changes where practical to ensure impacts do not continue or occur elsewhere within the mining area.	Environment Coordinator Mine Manager
Red level	Reduction in groundwater level extending for more than two months, below the criteria defined in the Water Management Plan.	Implement floristic monitoring of swamps (Section 6.4) in both impact and control swamps seasonally for a period of three years (or until otherwise agreed to with BCS and DPE, to assess changes to swamp size, vegetation composition and habitat). AND Implement non-compliance reporting requirements as outlined in Section 11.2. AND Submit non-compliance report to DPE, BCS and WaterNSW. AND Comply with any directions from DPE or BCS.	Environment Coordinator Environment Coordinator Environment Superintendent Environment Superintendent

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Table 8.3 Swamp Size, Vegetation Composition and Habitat Change TARP

Trigger level	Trigger	Action and Response	Responsibility
Green level	No change in swamp size, vegetation composition or species habitat	Continue monitoring in accordance with this management plan	Environment Coordinator
Amber level	Change in swamp size, vegetation composition or species habitat	Investigate significance of change.	Environment Coordinator
		AND Implement incident notification procedures outlined in Section 11.1 and submit incident notification to DPE, BCS and WaterNSW.	Environment Superintendent
		AND Investigate potential cause of change and determine if change is mining related.	Environment Superintendent
		AND Submit incident investigation report to DPE, BCS and WaterNSW.	Environment Superintendent
		AND Comply with any directions from DPE or BCS.	Environment Superintendent
Red level	Change in swamp size, vegetation composition or species habitat determined to be mining related	Implement non-compliance reporting requirements as outlined in Section 11.2.	Environment Coordinator
		AND Submit non-compliance report to DPE, BCS and WaterNSW.	Environment Superintendent
		AND Comply with any directions from DPE or BCS.	Environment Superintendent

Table 8.4 Microbat TARP

Trigger level	Trigger	Action and Response	Responsibility
Green level	No identified impacts to microbat habitat structures or microbats roosting during torpor	Continue monitoring in accordance with this management plan.	Environment Coordinator
Amber level	Short term disruptions to Old Gantry and Tumbler House microbat habitat or disturbance to microbats during winter torpor period	Cease construction activities in the immediate vicinity of the Old Gantry and Tumbler House. AND Contact suitably qualified ecologist to inspect the Old Gantry Tumbler House. AND Implement any additional monitoring and management measures as recommended by the ecologist. AND Implement incident reporting procedures outlined in Section 11.1. AND Complete incident investigation procedures detailed in Section 10.1 and provide incident investigation report to DPE and BCS.	Environment Coordinator Environment Superintendent Environment Superintendent Environment Superintendent Environment Superintendent
Red level	Microbat habitat impacted resulting in long term impact to habitat and roosting microbats	Contact suitably qualified ecologist to inspect habitat and advise on appropriate future monitoring and management measures. AND Implement non-compliance reporting requirements as per Section 11.2. AND Submit non-compliance report to DPE and BCS. AND Comply with any directions from DPE or BCS.	Environment Coordinator Environment Superintendent Environment Superintendent Environment Superintendent

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Table 8.5 Surface Disturbance TARP

Trigger level	Trigger	Action and Response	Responsibility
Green level	All surface disturbance is within assessed and approved areas	Continue monitoring in accordance with this management plan.	Environment Coordinator
Red level	Surface disturbance identified outside assessed or approved areas.	Implement mitigation and/or remediation measures to ensure the impacts are not exacerbated. AND Implement incident notification procedures as detailed in Section 11.1. AND Contact a suitably qualified ecologist to assess extent of any impact to biodiversity values and implement incident investigation procedures as detailed in Section 10.1. AND Submit incident investigation report to DPE and BCS. AND Comply with any directions from DPE or BCS.	Environment Coordinator Environment Coordinator Environment Superintendent Environment Superintendent Environment Superintendent

9 OFFSETS

Biodiversity offsets are required to be secured to compensate for the direct impacts of native vegetation clearing at the WWC pit top. In accordance with the requirements of Schedule 4 Condition 29, The ecosystem and species credits identified in **Table 9.1** must be retired prior to commencing vegetation clearing in consultation with BCS and in accordance with the Biodiversity Offsets Scheme of the BC Act.

WCL will satisfy this offset liability through payment into the NSW Biodiversity Conservation Trust (BCT).

Table 9.1 Biodiversity Offset Obligations

Credit Type	Area (ha)	Offset Liability
Ecosystem Credits		
PCT 906 - Lilly Pilly - Sassafras - Stinging Tree subtropical/warm temperate rainforest on moist fertile lowlands, southern Sydney Basin Bioregion - moderate	0.01	1
PCT 1245 - Sydney Blue Gum x Bangalay - Lilly Pilly moist forest in gullies and on sheltered slopes, southern Sydney Basin Bioregion - low	0.02	1
Species Credits		
Large Bent-winged Bat	0.02	1
Little Bent-winged Bat	0.02	1
Large-eared Pied Bat	0.02	1

10 INCIDENTS, NON-COMPLIANCE, AND COMPLAINTS

10.1 Incidents and Non-compliance

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment. As defined in PA 09_0161, material harm to the environment is *'if it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial'*.

A non-compliance is an event that results in the performance criteria being exceeded or a condition of PA 09_0161 not being met.

When an incident is identified, WCL will immediately notify DPE and any other relevant agencies in accordance with the incident reporting protocol detailed in **Section 11.1** and the TARP provided in **Section 8**. For any non-compliances, the reporting requirements detailed in **Section 11.2** will be triggered.

WCL will investigate the cause and immediately implement measures to mitigate any ongoing risk of impact. Where appropriate, adaptive management measures will be implemented as per the TARP provided in **Section 8** to ensure the incident or non-compliance does not continue.

Monitoring results above the PA 09_0161 criteria will not be considered as exceedances until the data has been assessed.

10.2 Complaints Handling

WCL operates a dedicated 24-hour community contact line (1300 109 384) and email address (community@wcl.net.au). Details of these community contact lines are available on the WCL website.

All complaints are handled in accordance with the *WCL Community Complaints and Enquiries Procedure* (WCL EC PRO 002). At the time of the complaint or enquiry, the WCL representative receiving the community complaint or enquiry information is to follow the complaint management process shown on **Figure 10.1**.

When a complaint is received, the complaint is recorded, assessed, and investigated (if necessary) in accordance with the *WCL Incident Management Procedure* (WCL HS PRO 001). In the event of an environmental or community complaint, the WCL Environment Department is responsible for coordinating the implementation, as soon as practicable, of temporary mitigation measures in response to the complaint. These are short-term measures aimed at reducing/stopping the impact of or removing the cause of the complaint, where practical. Following an investigation into the event, it may be recommended that additional corrective and or preventative actions are required to prevent the community complaint from reoccurring. WCL will prepare and provide a response to the complainant including what actions have been taken to investigate and address the complaint.

Complaints are recorded in a complaints register (updated monthly) and made available on the WCL website. All complaints are detailed in the Annual Review as detailed in **Section 11.3**.

Figure 10.1 Wongawilli Colliery Complaints Procedure



11 REPORTING

The following reporting relevant to biodiversity management will be implemented by WWC:

- incident reporting;
- non-compliance reporting;
- complaints reporting;
- Microbat Exclusion Reporting
- Annual Review reporting; and
- Community Consultative Committee reporting.

11.1 Incident Reporting

As required by Schedule 6 Condition 6 of PA 09_0161, following WCL becoming aware of any incident that causes or threatens to cause material harm to the environment, WCL will immediately notify DPE and any other relevant agencies in writing via the Major Projects website. The notification will:

- identify the development (including the development application number and name); and
- set out the location and nature of the incident.

Relevant agencies to notify in the event of an incident relating to biodiversity are identified within the TARP provided in **Section 8**.

11.2 Non-compliance Reporting

As required by Schedule 6 Condition 7 of PA 09_0161 a notification of any non-compliance will be made in writing to the DPE via the Major Projects website within seven days of becoming aware of the non-compliance. The notification to DPE will:

- identify the development (including the development application number and name),
- set out the condition of the consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known); and
- what actions have been, or will be, undertaken to address the non-compliance.

WCL will comply with any directions from DPE regarding the notification of any non-compliance.

A non-compliance which has been notified as an incident in accordance with **Section 11.2** does not need to also be notified as a non-compliance.

11.3 Microbat Exclusion Reporting

A report will be prepared outlining the findings of microbat pre-clearance assessments and detail the exclusion measures installed and any recommendations or procedures if required.

11.4 Annual Review

As required by Schedule 6 condition 3 of PA 09_0161, by the end of September each year (or other such timing as agreed by the Secretary), WCL must review the environmental performance of the development to the satisfaction of the Secretary. This review must:

- describe the works (including any rehabilitation) carried out in the past year, and the works proposed to be carried out over the next year;
- include a comprehensive review of the monitoring results and complaints records of the development over the past year, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions;
- identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the development;
- identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the development.

The Annual Review will be submitted to DPE and made available on the WCL website.

11.5 Community Consultative Committee

WCL has an established CCC for WWC that operates generally in accordance with the DPE Community Consultative Committee Guideline for State Significant Projects (January 2019). The CCC is a forum to discuss the development and outcomes of monitoring programs. The WWC CCC meets four times a year with minutes of the meetings made available on the WCL website.

12 CONTINUAL IMPROVEMENT

12.1 Overview

WCL will continue to investigate and implement ways to improve the environmental performance of operations over time. Continual improvement of environmental performance shall be achieved through:

- environmental monitoring;
- review of management measures;
- risk assessments;

- environmental inspections and implementation of corrective and preventative actions; and
- audits.

It is the responsibility of the WWC Environment Superintendent to ensure these activities are undertaken as required and detailed below.

12.2 Environmental Monitoring

WCL implements a comprehensive environmental monitoring program, as detailed in **Section 6**, to assess the performance of WWC against the performance criteria, establish trends and identify the need for any additional management or mitigation measures. The effectiveness of the monitoring program is reviewed within three months following any incident, non-compliance or complaint being received and annually as part of the Annual Review to ensure performance and impacts are adequately measured.

12.3 Review of Management Measures

Within three months following any incident, non-compliance or investigation of a complaint being completed, WCL will complete a review of the effectiveness of management and mitigation measures implemented on site and, if necessary, implement additional management or mitigation measures to ensure that the incident or non-compliance does not continue or re-occur, or the complaint has been adequately addressed.

12.4 Risk Assessments

Site based environmental risk assessments are conducted to identify key environmental risks, review the adequacy of controls and identify any additional controls necessary to manage any risks to acceptably low levels. The site based environmental risk assessment will be reviewed annually following completion of the Annual Review.

12.5 Environmental Inspections

Weekly environmental inspections of the WWC surface operations are carried out. Any preventative or corrective actions identified during the site inspections are recorded and work orders created to ensure responsibility is assigned and required actions are implemented.

12.6 Audits

As required by Schedule 6 Condition 8 of PA 09_0161, unless the Secretary agrees otherwise, WCL is required to commission and pay the full costs of an independent environmental audit by the end of June 2013 and every 3 years thereafter.

The independent environmental audit must:

- be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
- include consultation with the relevant agencies;

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- assess the environmental performance of the development and assess whether it is complying with the requirements in the consent and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);
- review the adequacy of strategies, plans or programs required under the abovementioned approvals; and
- recommend measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under these approvals.

The audit team must be led by a suitably qualified auditor and include experts in any field specified by the Secretary.

Within six weeks of the completion of this audit, or as otherwise agreed by the Secretary, WCL must submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.

13 REVIEW

This management plan will be reviewed, and where necessary updated, in accordance with the requirements of Schedule 6 Condition 4 of PA 09_0161. Specifically, this management plan will be reviewed within three months of:

- the submission of an annual review;
- the submission of an incident report;
- the submission of an audit report; and
- any modification to the conditions of the consent (unless the conditions require otherwise).

Where the review leads to revisions to the management plan, then within four weeks of the review, the revised management plan will be submitted to the Secretary for approval.

In addition, this management plan will be reviewed and updated if necessary as a result of:

- changes to any relevant regulatory or statutory requirements; or
- any significant change to biodiversity management practices or management measures.

14 CONTROL AND REVISION HISTORY

PROPERTY	VALUE
Approved by	Environmental Superintendent
Document Owner	Tom McMahon
Effective Date	5 August 2022

Revisions

VERSION	DATE REVIEWED	REVIEW TEAM (CONSULTATION)	NATURE OF THE AMENDMENT
1	5/08/2022	Tom McMahon_WCL, EMM Consulting	Initial management plan required as part of Project Approval PA 09_0161 (MOD 2).
2			
3			

APPENDIX A BUSHFIRE MANAGEMENT PLAN

A.1 INTRODUCTION

This Bushfire Management Plan (BMP) has been prepared for Wollongong Coal Limited (WCL) to manage and maintain the integrity of Wongawilli Colliery (WWC) and the surrounding environment from potential impacts of bushfires.

A.1.2 Purpose and Scope

The objective of this BMP is to:

- identify the bushfire risk on and surrounding the WWC;
- protect life and safety, property and community assets from the adverse effects of fire;
- protect the value of environment and cultural assets;
- prevent the occurrence of bushfires on the WWC site and to minimise the spread of a bushfire from the WWC;
- comply with the relevant legislated requirements for bushfire management;
- provide for emergency management operations; and
- develop and strengthen relationships with neighbours and stakeholders.

The scope of the BMP is to identify the risk of fire and implement appropriate practices to protect the:

- safety of Wollongong Coal Limited (WCL) staff and contractors and the adjacent surrounding residential community;
- infrastructure assets including all WWC above ground assets;
- natural environment including native vegetation and species; and
- provide a framework for ongoing monitoring and management of identified bushfire risks.

A.2 REGULATORY REQUIREMENTS

A.2.1 Overview

This BMP has been prepared to fulfil the requirements of relevant legislation, approval conditions, commitments in environmental assessments, and relevant standards and guidelines.

All land managers in NSW have a legislated responsibility to prevent the occurrence of bushfires on lands under their control. Land managers have an additional responsibility to extinguish a fire on their land (if possible) and notify an appropriate authority if the fire is beyond control.

The following sections summarise those regulatory requirements that are most relevant in relation to this BMP.

A2.2 Legislative Requirements

Legislation applicable to bushfire management in NSW includes but is not limited to:

- *Rural Fires Act 1997* (Section 63); and
- *Work, Health and Safety Act 2011*.

A2.3 Guidelines and Standards

This BMP has been developed with consideration to the following guidelines and document:

- Illawarra Bush Fire Risk Management Plan 2015-2020; and
- NSW Rural Fire Services, Planning for Bushfire Protection Guide (2019).

A2.2.4 Project Approval

The conditions of PA 09_0161 relevant to this management plan and where they have been addressed within this BMP are provided in **Table A.1**.

Table A.1 Relevant Project Approval (PA 09_0161) Conditions

Condition No.	Condition – details	Where addressed
Schedule 4 Condition 25	The Applicant must:	
(a)	ensure that the development is suitably equipped to respond to fires on site; and	Section A.7
(b)	assist the Rural Fire Service and emergency services as much as possible if there is a fire in the vicinity of the site.	Section A.10

A.3 BUSHFIRE RISK

A.3.1 Fire Danger Rating

This WWC is within the Greater Sydney region and the forest fire danger index is FDI100.

A.3.2 Illawarra Bush Fire Risk Management Plan

The WWC sits within the Illawarra Bush Fire Risk Management Plan area of management (Illawarra BFRMP, 2015-2020), however no specific risk management actions have been allocated to the WWC site in the BFRMP.

The WWC is classified as a priority 2A (very high risk) based on the following:

- economic asset (WWC was operational when the BFRMP was drafted);
- likely to be affected by fire; and

- major consequence.

The designated treatments in the BFRMP are:

- '#89 APZ maintenance' and
- '#102 maintain fire trails'.

A.3.3 Climate and Bushfire Season

WWC operations are in an area characterised as a warm temperate region with significant variation in temperature and rainfall due to topographic effects such as orographic rainfall, and the proximity of the site to the coast. Rainfall within the area varies greatly between the top of the escarpment and the base of the escarpment.

Bushfire season in this area generally occurs during late winter and spring (Illawarra Bush Fire Management Plan 2015-2020) and strong south-westerly winds often occur during this time. In years where summer rainfall is lower than average, the bush fire season extends though summer into early autumn. Extreme fire danger usually occurs during strong west to north westerly winds, particularly where prolonged drought conditions are present and humidity indices are low.

A.3.4 Vegetation

The Illawarra escarpment is characterised by dense vegetation and undergrowth with variable vegetation types and communities including rainforests, wet and dry sclerophyll forests, heathland, as well as grasslands, pastoral lands, and open woodlands. The remote areas, steep slopes and dense bushland areas of the escarpment are difficult to readily access to manage uncontrolled bushfire.

WWC pit top is located on the edge of the escarpment which contains a higher area of cleared or disturbed land and exotic pastures with some remaining remnant vegetation.

A.4 BUSHFIRE HISTORY

The Illawarra area has experienced bushfire on a variety of occasions with wildfires occurring mostly along the escarpment and plateau (Illawarra Bush Fire Management Committee, 2008). Fires generally travel in an easterly direction under the influence of westerly winds. Southerly and/or easterly winds also have the potential to intensify wildfire burning on or along the escarpment.

Major fires have occurred within the escarpment in September 1939, October 1968, November 1980, January 1994, December 1997, and December 2001. These fires all coincided with extended drought periods and extreme fire weather and burnt extensive areas both below and on top of the escarpment.

A.5 IGNITION SOURCES

Preventing ignition of bushfires, particularly on days when severe weather conditions prevail, is an important strategy for managing bushfires. To ensure effective management programs are place, it is important to understand the patterns and major sources of ignition in the project area and potential management actions.

A.5.1 Internal Ignition Sources

The principal potential causes of bushfires resulting from activities associated with WWC operations have been identified as being:

- fires on plant and equipment and/or occurring as a consequence of maintenance activities on that plant or equipment (e.g. hot work);
- electrical equipment faults; and
- overhead power line arcing faults and debris on power lines causing an arc.

A.5.2 External Ignition Sources

External ignition sources may include:

- arson and burning of dumped cars; and
- loss of containment of authorized hazard reduction burn.

A.5.3 Natural Ignition Sources

Natural sources of bushfire ignition may include:

- lightning strike

A.6 BUSHFIRE HAZARD

A.6.1 Assets

A key component of this BMP is the identification of bushfire hazards, the risk of harm or damage to the assets and how it can be mitigated. This BMP focuses broadly on life and safety; infrastructure; and the environment.

A.6.2 Personal Safety

The safety of persons from the potential impacts of fire is considered the highest priority. The BMP recognises the safety of the following persons as paramount:

- WCL staff and contractors, site visitors;
- general public and neighbouring landowners/occupiers, residents, visitors; and
- attending emergency management services (e.g. NSW Rural Fire Service (RFS), NSW Fire and Rescue).

A.6.3 Infrastructure Assets

Infrastructure assets within the lease area are typically infrastructure used for mine operations and utility infrastructure that intersects the lease area.

The industrial/mining infrastructure has been designed with materials that would offer some form of protection against bushfire, however, the potential for a fire to impact the infrastructure still remains and can be mitigated.

All buildings (workshops, offices, amenities) and machinery are equipped with approved fire protection (e.g. extinguishers, fire hose reels and smoke alarms), which are inspected and tested regularly in accordance with relevant regulations.

A list of WWC assets is included in **Table A.2**.

Table A.2 Asset Inventory

Asset Name	Asset Number	Asset Type
Tumbler House	001	Heritage Building/ Old Portal
GI Sheds	002	Heritage Building/ Offices/ Equipment
Explosive Storage	003	Equipment
B Portal	004	Conveyor Portal
C Portal	005	Transport Portal/ Critical Infrastructure
Track Road Portal	006	Ventilation Portal
RTV Portal	007	Transport Portal/ Critical Infrastructure
Fire Station	008	Building/ Equipment
Dust Silo	009	Storage Silo
Bulk Equipment Shed	010	Storage Area
Admin	011	Building
Workshop	012	Workshop/ Oil Storage Area
Car Park	013	Car Park
Junk Yard	014	Storage Area
Gun Club Access	015	Private Usage Area
Decline Conveyor	016	Linear Infrastructure
Sizer Building	017	Building
Critical Switch Room	018	Building
Residential Building	019	Building
Stockpile	020	Storage Area
Old Bathhouses	021	Heritage Building
Water Pump Shed	022	Shed
Junk Yard	023	Storage Area
Offices	024	Building
Equipment Store	025	Storage Area
Nebo No.3 Shaft	026	Ventilation Shaft
Ventilation Shaft Surface Infrastructure	027	Ventilation Shaft
Boreholes	028	Subsurface Infrastructure
Powerline Easement	029	Easement

Table A.2 Asset Inventory

Asset Name	Asset Number	Asset Type
Electrical Substation	030	Compound Area
Portals	031	Abandoned Portal
Heritage Housing	032	Heritage Buildings

The key features considered in WWC bushfire management planning include:

- mining related infrastructure, buildings and equipment;
- utility infrastructure (electricity, water, communications); and
- private properties (including residential dwellings and/or agricultural uses).

A.6.4 Environmental Assets

The Illawarra Escarpment and coastal plain support a diverse range of flora and fauna. In addition to this the escarpment contains areas reserved for water catchments, national parks and conservation areas including:

- threatened species and vegetation communities; and
- significant water bodies.

A.6.5 Cultural Assets

Relevant cultural assets on and adjacent to the WWC mining lease areas includes objects of both Aboriginal and European cultural significance.

A.7 MANAGEMENT AND MITIGATION

The risk and potential impact of bushfires on WWC facilities and infrastructure are minimised through the implementation of a number of key risk control measures. The risk control measures outlined below are implemented to reduce the company's exposure to the impacts of bushfires and aiding in the protection of assets and surrounding property in the event of a bushfire. These control measures include:

- the establishment and maintenance of 'Asset Protection Zones' (APZ) around WCL infrastructure;
- site and building maintenance: fire hazard accumulation and collection points on conveyors, powerlines and buildings inspected and addressed on a seasonal basis to ensure that build-up or presence of flammable material (or overhanging branches) are reported and removed as required;
- regular access inspections (monitoring program) and directed maintenance/works of surface roads, fire trails and access tracks carried out as required;

- site security to prevent unauthorised access to site and fire trails via locked Fire Trail access gates and site access gates to other WCL controlled areas;
- water supply and firefighting aides: highlight and maintain equipment on-site for attending to fires including fire hydrants, extinguishers, connections and hoses installed at strategic locations around the sites;
- communication and administration controls: controlled hot work activities on site; and
- emergency management: comprehensive emergency response system the event of a bushfire emergency.

A.7.1 Asset Protection Zones

A passive asset protection activity to be conducted onsite is the management of vegetation around assets. This will primarily be done through routine maintenance, mowing and vegetation clearing around the site, to a performance criteria consistent with APZ as detailed in PBP 2019 (APZ separation setback from bushfire prone vegetation, and APZ management standards), or within access roads, easements and lay down areas (e.g. non-vegetated).

APZs areas cannot be used for the storage of materials and must kept clear of debris and other items that might limit effectiveness or access.

The maintenance of vegetation within the APZs, around ventilation shafts, located in drinking water catchment areas managed by WaterNSW, is conducted under, and in accordance with, the WaterNSW Activity Approval. WCL currently has approval from WaterNSW which allows the slashing and trimming of vegetation within a 5 to 10 m buffer around infrastructure within lands owned by WaterNSW to ensure an APZ is maintained.

APZs are a physical control method used to reduce the vegetation density around WCL assets and property boundaries, and they reduce the impact of fire on those assets in the event of a bushfire. To demonstrate the performance criteria for PBP 2019, APZs will be managed as:

- A minimum 10 m APZ (minimal defendable space) between a bush fire hazard and an asset;
- APZs are managed in accordance with the Appendix 4 of the NSW Rural Fire Services, Planning for Bushfire Protection Guide (2019) which includes:
 - preferably no trees, removal of regrowth trees and pruning any overhanging branches;
 - avoid (remove) shrubs in the APZ;
 - maintain grasses and ground covers (mowing and slashing) to 10 centimetres; and
 - Remove build-up of fine fuels and fallen branches etc.

APZs are inspected routinely (monthly) for vegetation regrowth or build up. The inspection will trigger the direct any clearing of vegetation within the APZs to be conducted by WCL contractors as required, preferably prior to the commencement of the annual bushfire season.

A.7.2 Hazard Reduction Burns

Any hazard reduction burns conducted on WWC will be planned by the RFS Bush Fire Management Committee and conducted by NSW RFS. Hazard reduction burns will be performed in conjunction with any other relevant authorities and in consultation/support with WCL representatives.

A.7.3 Easement Management

The WWC site maintenance requires that conveyor easements provide clearance and accessibility, such that these easements are managed to standards APZ standards and heavy vehicle access provided consistent with Cat 1 fire trails.

Power line easements will be maintained by the energy provider, however, WWC will monitor the easement and liaise with the energy provider to seek maintenance if required:

- if fallen trees or limbs overhang the easement;
- shrub and ground cover vegetation accumulation removed/slashed annually; and
- easement access tracks in good condition (i.e. Cat 9 vehicle standards).

A.7.4 Access Management

All vehicular access on the WWC shall have capacity to support minimum Cat 7 (light truck) fire fighting vehicles (or similar). Access maintenance should ensure all tracks that would be used for fire protection are consistent with the NSW RFS Fire trail Standards (March 2019):

- minimum weight capacity 8 tonne;
- minimum trafficable width 3.5 m (preferably 5.5 m wide);
- where access cannot provide 5.5 m width, apply a widened trafficable surface of at least 5.5 m for a length of at least 15 m, at 250 m intervals;
- avoid any dead-ends and drainage line crossings;
- apply suitable turning points equivalent to a 17 m diameter;
- minimum height clearance from overhead obstructions 3.5 m;
- maximum grade less than 15 degrees; and
- maximum crossfall less than 6 degrees.



Plate 1: Cat 7 fire Response Vehicle

A.7.5 Security

WWC will manage unauthorised access onto the WWC lease area through locked gates and security personnel, with the aim of reducing the likelihood of illegal fire ignition and arson.

A.7.6 Firefighting Aides and Suppressants

For the purpose of fire-fighting and fire protection, WWC provides an emergency water supply and connection to water on-site via:

- a water tank located on the upper pit top area;
- other static water supplies (site water storage and dams);
- fire hydrants and reticulated pipelines connections and hoses are installed at strategic locations around the site including along the conveyor; and
- fire protection such as fire reels, fire extinguishers for first response actions.

Fire protection equipment (fire extinguishers) are inspected at three monthly intervals using the criteria provided in the Australian Standard, AS1851 2012 Routine service of fire protection systems and equipment.

An urban reticulated water supply has been constructed associated with the Vista Park residential subdivision development. The nearest water hydrant is located at the corner (intersection) of Wongawilli Road and BankBook Drive.

A.7.8 Hot Works Management (Ignition Management)

Hot work is recognised as having significant potential to cause bushfire ignition and is therefore closely managed. Any hot works undertaken at WWC are conducted in accordance with a WWC Hot Work Permit. Hot works covered by this permit include gas cutting & welding, arc welding, grinding, chipping and plasma cutting (e.g. any work that has potential to create a potential spark). The hot works standard describes the minimum requirements for completing hot works safely onsite and outlines the following topics:

- circumstances when 'hot works' are limited or prohibited, such as during total fire bans, hot works on flammable containers, pressurised vessels;
- safety measures to be implemented when 'hot works' are being conducted, including task specific risk assessments, hot works permit, PPE, Equipment Checklists; and
- designated and non-designated hot work areas. During a total fire ban the Hot Works Permit system does not permit Hot Works to take place outside of the designated workshop.

A.8 TRAINING AND AWARENESS

All WCL employees and contractors will be inducted prior to commencing work on site and will include awareness of emergency response procedures.

All WCL staff, contractors and visitors, when operating on or attending WWC, should be aware of:

- local daily bush fire danger ratings (FDR) e.g. through daily safety briefings;
- local fire situation (are there any fires in the Illawarra region or the locality e.g. within 20km); and
- emergency evacuation procedures as per the EMP (contact details and route to evacuation location).

A.9 MONITORING PROGRAM

Regular monitoring of the bushfire mitigation measures at WWC will be conducted, and resulting actions and maintenance undertaken as required. Regular monitoring will include the following:

- as a minimum, monitoring will be conducted prior to the declared bushfire season (declared by NSW RFS);
- APZ assessment, ensuring the 10 m width and low/managed fuel loads;
- monitor any vegetation interference on conveyor easement;
- monitor and report vegetation encroachment or debris within powerline easements;
- assessment of roads and access conditions consistent with **Section A.7.4 Access Management**;
- suitability of water supplies such as:
 - emergency water volume;
 - access to reticulated water points (hydrants); and
 - access and volumes of static water supplies such as dams; and

- building inspections (maintenance of structures and any associated landscaping).

Periodic formal or informal site inspections will also be invited from the Wongawilli Rural Fire Service.

The results from the monitoring and any improvement opportunities relating to bushfire risk management identified through the monitoring process will be actioned.

A.10 BUSHFIRE EMERGENCY RESPONSE

A.10.1 First Response

Any fire that is either unmanaged or unplanned should be extinguished as quickly as possible (first response - if considered safe to do so) to avoid spread. If fire spread exceeds control for personal capabilities or resources, the following actions should be implemented:

- Establish safety for all persons present
- Extinguish the fire if safe to do so and if within the boundaries of expertise and equipment.
- Evacuate area to designated emergency assembly areas.
- Report fire to site control room.

WCL will provide assistance to the RFS where required to facilitate access to site or water supplies.

A.10.2 Emergency and Bushfire Evacuation

WWC maintains an 'Emergency Surface Evacuation Plan' as a requirement under AS3745-2002 'Emergency control organisation and procedures for buildings, structures and workplaces'. The following is provided as a guide for evacuation during a bushfire event.

Observation/ situation	Bush Fire Danger Rating (FDR)						
	Low/ Moderate	High	Very High	TOTAL Fire Ban Declared	Severe	Extreme	Catastrophic
Out of control fire <1km from site	- Move to emergency assembly point. - Seek instruction from Wongawilli Colliery site supervisor and emergency services.	- Move to emergency assembly point. - Seek instruction from Wongawilli Colliery site supervisor and emergency services.	- Move to emergency assembly point. - Seek instruction from Wongawilli Colliery site supervisor and emergency services.		- Close the site for any works. - Situational awareness. - Seek instruction from emergency services.	- Close the site for any works - Situational awareness. - Provide assistance to emergency services.	- Close the site for any works. - Situational awareness. - Provide assistance to emergency services.
Out of control fire within 20km of site	- Normal operation. - Seek instruction from Wongawilli Colliery site supervisor.	- Normal operation. - Seek instruction from Wongawilli Colliery site supervisor.	- Move to emergency assembly point. - Seek instruction from Wongawilli Colliery site supervisor.		- Close the site for any external works. - Be ready to initiate evacuation to designated location. - Move to emergency assembly point. - Seek instruction from emergency services.	- Close the site for any external works. - Situational awareness. - Provide assistance to emergency services.	- Close the site for any external works. - Situational awareness. - Provide assistance to emergency services.
Bushfires within Illawarra region but not considered a direct concern	Normal operation.	- Normal operation. - Situational awareness.	- Normal operation. - Situational awareness.		- Normal operation. - Situational awareness. - Seek instruction from Wongawilli Colliery site supervisor. - Be ready to initiate evacuation.	- Close the site for any external works. - Situational awareness. - Seek instruction from Wongawilli Colliery site supervisor.	- Close the site for any external works. - Situational awareness. - Provide assistance to emergency services.
No Fires within Region	Normal operation.	Normal operation.	Normal operation.		- Normal operation. - Situational awareness.	- Close the site for any external works. - Situational awareness. - Seek instruction from Wongawilli Colliery site supervisor.	- Close the site for any external works. - Situational awareness. - Provide assistance to emergency services.




A.10.2 Containment Lines for Bushfire Fighting

Hard containment lines (free of fuel loads and adequately wide) are preferred to minimise the risk of fire toward the site. In the event of a bushfire impacting the pit top area, it is recommended that containment lines for bushfire mitigation should utilise existing and dedicated roads, trails, or fire breaks as per the BMP map where possible, and to avoid unnecessary environmental damage.

A.11 REVIEW

The purpose of BMP review is to test the plans' suitability and practical use, and to maintain the plan to ensure it remains up to date.

This BMP should be reviewed on the following triggers:

- annual monitoring report – by WCL for the performance of the bushfire mitigation actions;
- after 5-years (2027) - overall review and consultation with key stakeholders (NSW RFS, NSW Fire and Rescue);
- as required - following any significant bushfire in surrounding area with potential to affect WWC; and
- any changes such as legislation changes, new site infrastructure or modified operations.

APPENDIX B BIODIVERSITY COMMITMENTS

Commitments made in various environmental assessment reports relating to biodiversity management and where they have been addressed in this management plan are provided in **Table B.1**.

Table B.1 Biodiversity Commitments

Commitment	Document contained within	Where addressed
During construction include: • installation of appropriate exclusion fencing around trees and vegetation to be retained in the study area; • installation of appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'; • identification of the location of any 'No Go Zones' in site inductions and a Construction Environmental Management Plan (CEMP); • all material stockpiles, vehicle parking and machinery storage will be located within cleared areas or areas proposed for clearing, and not in areas of native vegetation that are to be retained; • proposed hollow-bearing tree to be removed should be placed in the area of retained vegetation to provide additional fauna habitat; • removal of the hollow-bearing tree should be supervised by a qualified ecologist; • where appropriate native vegetation cleared from the subject land should be mulched for re-use on the site, to stabilise bare ground; • wet down areas to reduce dust generation during construction; • implementation of temporary stormwater controls during construction and to ensure that discharges to the drainage channels are consistent with existing conditions; and • sediment and erosion control measures should be implemented prior to construction works commencing (e.g. silt fences, sediment traps), to protect current drainage channels. These should conform to relevant guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works.	MOD 2 Modification Report (EMM December 2020)	Section 7.8 and CEMP

Table B.1 Biodiversity Commitments

Commitment	Document contained within	Where addressed
A microbat survey is to be undertaken during the day prior to the commencement of construction of the proposed conveyor. All potential habitat is to be inspected to confirm if microbats are present.	MOD 2 Modification Report (EMM December 2020)	Section 6.5, Section 7.8 and CEMP
Appropriate noise barriers are to be installed between the proposed conveyor and the old gantry and tumbler house before the start of construction, ensuring not to impede movement of microbats in and out of the structure.	MOD 2 Modification Report (EMM December 2020)	Section 7.2.1
It will be ensured that any staff that are required to undertake works within the vicinity of the structure are briefed on the importance of minimising disturbance to the structure and any potential resident microbats.	MOD 2 Modification Report (EMM December 2020)	Section 7.9 and CEMP
Any necessary lighting required for the proposed construction works will be directed away from the structures, and designed such that light spill does not occur within retained vegetation.	MOD 2 Modification Report (EMM December 2020)	Section 7.8.3 and CEMP
Maintain appropriate exclusion zones around the structures, and manage any night works by ensuring noise and light pollution is kept to a minimum, particularly through the breeding and lactation period (October and March) in the vicinity of the identified microbat habitat.	MOD 2 Modification Report (EMM December 2020)	Section 7.2.1
If it is identified that bats are present in torpor within the structure, fortnightly winter monitoring should be conducted during any upgrades or maintenance works to ensure that over-wintering roosting colonies are not being adversely impacted.	MOD 2 Modification Report (EMM December 2020)	Section 6.5, Section 7.8 and CEMP
Unexpected finds and stop works procedures are to be implemented if microbats are observed exiting the structure during construction.	MOD 2 Modification Report (EMM December 2020)	Section 7.8.2 and CEMP
Any permanent lighting required for operation of the proposed conveyor will be designed to be directed away from, and avoid light spill into, the structure and any retained vegetation.	MOD 2 Modification Report (EMM December 2020)	Section 7.2.1
Permanent noise barriers will be constructed between the conveyor and the microbat structure, to minimise noise or vibration disturbance to resident microbats.	MOD 2 Modification Report (EMM December 2020)	Section 7.2.1
The microbat structure will be designated as a permanent no-go-zone to avoid disturbance to microbats from increased foot traffic in the vicinity.	MOD 2 Modification Report (EMM December 2020)	Section 7.2.1

Table B.1 Biodiversity Commitments

Commitment	Document contained within	Where addressed
All potential habitat found not to support microbats during pre-clearance surveys and considered likely to be impacted by the proposed works is to have temporary exclusion measures installed to prevent microbats from moving in before works begin. These measures are to be installed immediately following the preclearance survey, to ensure microbats do not move into the habitat overnight. Exclusion measures may include: - thick tape (such as bitumen tape) or plywood installed over habitat; - expanding foam to remove cracks and gaps that may be utilised by microbats; and - sealing of all side entrances that connect the existing tunnel to other inactive sections of the adit system, including the old gantry and tumbler house. Sealing off these entrances will ensure that microbats are able to continue utilising inactive adit structures, without exposure to works within the exiting tunnel entrance. Exclusion measures are to be confirmed sufficient and effective by a qualified ecologist prior to works beginning. Any habitat not considered likely to be impacted by the works, for example permanently unused sections within the adit system are to remain available to any displaced microbats. This will include the installation of bat-friendly gates at any entrances to the system available to microbats. A detailed schedule of management, monitoring and mitigation measures specific to the construction phase of the project will be implemented in the CEMP.	MOD 2 Modification Report (EMM December 2020)	Section 7.8.2 and CEMP

Table B.1 Biodiversity Commitments

Commitment	Document contained within	Where addressed
If microbats are found to be present in the existing tunnel entrance during the pre-clearance inspection, but are not likely to be utilising the structure as a maternity roost (ie no evidence of pregnant or lactating females), then temporary exclusion measures are to be installed overnight once the bats have left the roost to forage. Planned roost exclusion can only be conducted outside the breeding season (October – March) and over wintering time (mid-May to August) under the supervision of a qualified ecologist to ensure all microbats have vacated the roost. The following safeguards must be considered to minimise potential impacts to displaced bats: • ensure that this procedure is not conducted during an extensive dry period (drought) as this could be detrimental and lead to mortality, if there is no nearby suitable habitat; and • avoid conducting this procedure during windy, full-moon, cold or rainy nights (ie >20 mm in 24 hours), as there is a low likelihood of roost exodus. The most beneficial timing for planned roost exclusion is in autumn (mid-April – early May) and the start of spring (September). This would avoid both the breeding and overwintering period for microbats.	MOD 2 Modification Report (EMM December 2020)	Section 7.8.2

Table B.1 Biodiversity Commitments

Commitment	Document contained within	Where addressed
If works and exclusion of roosting bats are required during the overwintering months (mid-May to August), when many culvert roosting bats enter torpor (hibernation state), the following additional safeguards must be adhered to: - nocturnal monitoring of roost activity is to be undertaken by a qualified ecologist, and bats must be confirmed as leaving the roost to forage on at least two separate occasions prior to installation of exclusion measures; - if bats are not confirmed as leaving the roost to forage (ie in winter torpor) additional monitoring is to be undertaken until regular foraging has resumed; and - works are not to impact upon the tunnel with bats present in winter torpor. - additional safeguards that must be considered when exclusion devices are installed include: - all roost exclusion should be done after dusk, once individuals have emerged to feed and an ecologist is satisfied no microbat individuals remain within the roost; and - roosting habitat that has been sealed must be regularly monitored to ensure the sealing mechanism remains intact and no microbats are able to utilise the habitat. If it is suspected that the exclusion mechanism has failed then an ecologist must re-inspect the habitat before the seal is reapplied. Alternative roosting habitat should be made or left available wherever possible when undertaking passive roost exclusion.	MOD 2 Modification Report (EMM December 2020)	Section 7.8.2
If threatened microbats are found to be present in the existing tunnel entrance during the pre-clearance survey, and appear to be in breeding condition (i.e. pregnant or lactating females, presence of young), any use of the tunnel will be immediately postponed and appropriately qualified ecologists will be consulted to determine the most appropriate steps to be taken. Appropriate approval authorities will also be notified.	MOD 2 Modification Report (EMM December 2020)	Section 7.8.2 and CEMP

Table B.1 Biodiversity Commitments

Commitment	Document contained within	Where addressed
Reports are to be provided outlining the findings of pre-clearance assessments and detailing the exclusion measures installed and procedure (if required).	MOD 2 Modification Report (EMM December 2020)	Section 11.3
On-going treatment of exotic species from within retained vegetation to be undertaken.	MOD 2 Modification Report (EMM December 2020)	Section 7.4
Two ecosystem credits are required to offset impacts to the two vegetation zones identified.	MOD 2 Submissions Report (EMM September 2021)	Section 9
Four species credits are required to offset impacts to fauna habitat.	MOD 2 Submissions Report (EMM September 2021)	Section 9

APPENDIX C SUMMARY OF CONSULTATION

A summary of correspondence sent and received in relating to the development of this management plan is provided in **Table C.1**.

Table C.1 Correspondence Sent and Received

To / From	Date	Description
BCS	27 June 2022	Submitted for consultation.
BCS	25 July 2022	Feedback from BCS on draft management plan.
DPE	5 August 2022	Submitted for approval.
BCS	14 September 2022	Additional feedback on revised management plan.
DPE	21 September 2022	Request to address additional BCS feedback.
DPE	12 October 2022	Resubmitted for approval

A summary of matters raised in feedback and where they have been addressed in this management plan is provided in **Table C.2**.

Table C.2 Feedback Received

From	Feedback	Where addressed
BCS	In section 4.5.2 are comments relating to absence of fish community status mapping or indicative threatened fish species mapping along the mapped tributaries of Lake Avon within the proposed extension of NWMD area. The former Avon River and other nearby waterbodies are mapped by the NSW Department of Primary Industries (2016) within their freshwater threatened species distribution maps for Macquarie Perch. This threatened species is listed under schedule 4 of the NSW Fisheries Management Act 1994 administered by Department of Primary Industries (not BCD). The comments in the BMP may need to be reviewed, and depending on such review, consultation with the relevant agency may be required.	A review of the NSW Department of Primary Industries freshwater species distribution maps for Macquarie Perch was undertaken by EMM on 1 August 2022. This review confirmed that there is no mapped Macquarie Perch habitat within the proposed NWMD mining area or surrounding pit top.
	Section 6.6 and 6.7 mentions weed management program and pest monitoring and control program. Whilst agreeing on the importance of such programs, it is unclear at this stage their scope, targets and duration. Without these being available, BCD cannot comment further but encourages these programs to be: specific, measurable, achievable, realistic and timely (SMART).	Section 6.6 and 6.7 of the management plan has been updated to include a commitment to have a detailed weed and pest monitoring and management program for the WWC developed in 2022 for implementation in 2023 with targets for weed and pest management that are specific, measurable, achievable, realistic and timely.

Table C.2 Feedback Received

From	Feedback	Where addressed
	BCD support the proposed tree protection measures identified in Section 7.3 and recommends referencing the Australian Standard 4970-2009 Protection of Trees on Development Sites (especially refer to figures 3 and 4 as appropriate – on pages 16 and 17). We also recommend that this tree protection method be implemented for all trees during construction where construction activities may occur within Tree Protection Zones.	Section 7.3 of the management plan has been updated to include a commitment to implement tree protection measures generally in accordance with Australian Standard 4970-2009 Protection of Trees on Development Sites.
	BCD would like to highlight the importance of ensuring effective training and awareness for site workers where their roles may interact with biodiversity values. Such intentions are noted in the BMP in section 7.9 and in the commitments of Appendix B. These measures are the best efforts to ensure “negligible environmental consequence” to threatened species, populations and ecological communities and “negligible impact” to biodiversity values – as per section 5.	Section 7.9 of the management plan has been updated to include specific awareness in the induction program for staff and contractors involved in construction activities regarding the importance of minimising impacts to biodiversity values.
	Section 7.3.1 identifies removal of one, medium sized, hollow-bearing tree (HBT) under supervision of a suitably qualified ecologist. Although this tree was not presented as suitable habitat for large forest owls, it still may be breeding habitat or torpor habitat for other species. The range of species should be listed and the time of year and duration they may depend on the hollow for reproduction/torpor should be identified. Programming removal of the HBT should occur outside these times of dependency. Mitigation measures to address suitable timing for removal of HBT should be included in the BMP. A location of the HBT on a map and its coordinates would be expected to be included in a BMP.	Section 7.3 and Section 7.3.1 of the management plan has been updated to include a pre-clearance procedure during which hollow bearing trees and significant tree limbs will be marked out with coordinates provided to the site Environment Superintendent.
	Vegetation clearing/disturbance is proposed, however, there are no comments relating to the applicable mitigation measures: pre-clearing survey or a protocol on staged clearing. Both mitigation measures are identified in the NSW Biodiversity Assessment Method 2020 and should be implemented to minimise impacts to biodiversity for example by providing time for fauna to vacate habitat. The BMP should be updated to include mitigation measures that address pre-clearing surveys and a protocol on staged vegetation clearing.	

Table C.2 Feedback Received

From	Feedback	Where addressed
	The injured fauna management section 7.3.2 is a part of the BMP where the role of all site workers may potentially interact with. On this basis, it is important to ensure its linkage with the BMP section 7.9 and to ensure site workers are inducted to their responsibility in responding to injured fauna.	Section 7.3.2 has been consolidated into a revised Section 3 to include detailed clearing procedures including the identification and management of fauna and any injured fauna. Section 7.9 of the management plan has been updated to include awareness to staff and contractors involved in construction activities on the procedures to be implemented should injured wildlife be identified in the work area.
	Section 7.4 identifies the notion of a "competent person" for the purposes of weed management. Given the condition of the vegetation, importance of its habitat and the land tenure/purpose BCD strongly recommend that weed management is conducted by suitably qualified and experienced bush regenerators.	Section 7.4 of the management plan has been updated to include a commitment for weed management practices and the application of herbicides to be undertaken by a competent person with experience in bush regeneration.
	In section 7.7, pathogen management should also extend to address Infection of frogs by amphibian chytrid causing the disease chytridiomycosis. This is also a key threatening process listed under schedule 4 of the <i>Biodiversity Conservation Act 2016</i>. The reference (in section 2.5) to the NSW Department of Planning, Industry and Environment (2020) <i>Saving our Species Hygiene Guidelines</i> provides guidance and the BMP should be updated to address this pathogen. BCD would also like to see greater details in the BMP on the criteria WCL proposes to utilise and how this will be checked during works to ensure contractors use good hygiene practices to reduce the risk of spreading pathogens. BCD suggest that development of milestones in a CEMP (such as hold points) and that these are checked – may assist with efforts for effective management.	Section 7.7 has been updated to include reference to the risk of infection of frogs by amphibian chytrid and include hygiene protocols for personnel, clothing, footwear, tools and equipment are detailed below and consistent with the NSW Department of Planning, Industry and Environment <i>Saving our Species Hygiene Guidelines</i> (2020). Section 7.7 includes a commitment for a check of basic hygiene practices being implemented through a pre work checklists to be completed by the contractors and WCL Project Manager prior to commencing construction activities on site.

Table C.2 Feedback Received

From	Feedback	Where addressed
	The implementation and maintenance of detailed erosion and sediment control plan (a component of the Water Management Plan as mentioned in section 7.8.1) is critical for managing impacts to water quality and associated biodiversity values (including frog threatened species). BCD suggest that development of milestones in a CEMP (such as hold points) and that these are checked by a suitably qualified practitioner (e.g.: a Certified Professional in Erosion and Sediment Control) – may assist with efforts for effective management.	Section 7.8.1 has been updated to include a commitment to have sediment fences inspected prior to the commencement of construction activities by a suitably qualified practitioner (e.g. a certified professional in erosion and sediment control) with weekly inspections, and inspection immediately after rainfall, undertaken to ensure erosion and sediment fences remain intact and effective.
	Induction or procedural documentation should be developed for relevant site workers to ensure that the WWC Environment Superintendent is contacted immediately if microbats are seen exiting the Old Gantry and Tumbler house (as identified in section 7.8.2). This should be in addition to the related comments in section 7.9 of the BMP.	Section 7.9 of the management plan has been updated to include a commitment to awareness of staff and contractors involved in construction activities of the procedures and requirements to contact the Environment Superintended immediately if microbats are seen exiting the Old Gantry and Tumbler House during construction activities.
BCS	Detail required in the BMP relating to the suitable timing for removal of hollow bear tree (HBT). Specifically, the range of species should be listed and the time of year and duration they may depend on the hollow for reproduction/torpor should be identified.	Section 4.5.1 has been updated to include the species likely to utilise the hollow bearing tree as habitat. Section 7.3.1 has been updated to include an assessment of when species would likely be utilising the hollow bearing tree habitat and identify optimal timing for removal of the hollow bearing tree to avoid impact to potential threatened species likely to utilise the hollow bearing tree habitat.
	Programming the removal of the HBT should occur outside these times of dependency.	Section 7.3.1 has been updated to include a commitment to avoid removal of the hollow bearing tree during periods identified as it potentially being utilised by threatened species.
	The location of the HBT on a map and its coordinates would be expected to be included in a BMP.	Coordinates of the hollow bearing tree have been included in Section 4.5.1 and the location shown on Figure 4.2.