



**WAMBO  
WATER MANAGEMENT PLAN**

Document No. WA-ENV-MNP-509  
November 2020

## Document Control

<b>Document No.</b>	WA-ENV-MNP-509
<b>Title</b>	Wambo Water Management Plan
<b>General Description</b>	Water Management at the Wambo Coal Mine
<b>Document Owner</b>	WCPL Environment & Community Manager

## Revisions

<b>Rev No</b>	<b>Date</b>	<b>Description</b>	<b>By</b>	<b>Checked</b>
1	August 2020	New overarching water management plan for the Wambo Coal Mine and Coal Handling Facilities. Addresses requirements of DA305-7-2003, DA177-8-2004 and EPL 529.	WCPL	CB
2	November 2020	Address minor comments from DPIE	WCPL	-

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	BACKGROUND .....	1
1.2	PURPOSE AND OBJECTIVES.....	4
1.3	SCOPE .....	5
1.4	RELATIONSHIP WITH OTHER DOCUMENTS.....	1
1.5	INTEGRATION WITH UNITED WATER MANAGEMENT SYSTEM .....	2
1.6	STAKEHOLDER CONSULTATION .....	3
1.7	SUMMARY OF COMMITMENTS.....	3
<b>2.0</b>	<b>STATUTORY AND OTHER REQUIREMENTS .....</b>	<b>4</b>
2.1	LEGISLATION.....	4
2.2	POLICIES, GUIDELINES AND STANDARDS .....	6
2.3	PROJECT APPROVAL .....	10
2.4	ENVIRONMENT PROTECTION LICENCE 529 .....	17
2.5	WATER LICENCES .....	17
2.6	MINING TENEMENTS AND EXPLORATION LICENCES.....	18
<b>3.0</b>	<b>BASELINE DATA.....</b>	<b>21</b>
3.1	EXISTING ENVIRONMENT.....	21
3.2	BASELINE MONITORING DATA.....	27
<b>4.0</b>	<b>PLANNING .....</b>	<b>28</b>
4.1	WATER MANAGEMENT TYPES.....	28
<b>5.0</b>	<b>IMPLEMENTATION.....</b>	<b>29</b>
5.1	WATER MANAGEMENT SYSTEM.....	29
5.2	SITE WATER BALANCE .....	34
5.3	SITE SALT BALANCE .....	34
5.4	GROUNDWATER MODEL .....	34
5.5	SECURITY OF SUPPLY.....	35
5.6	TRAINING AND COMMUNICATION .....	35
<b>6.0</b>	<b>MEASUREMENT AND EVALUATION.....</b>	<b>36</b>
6.1	SITE WATER AND SALT BALANCE.....	36
6.2	GROUNDWATER INFLOWS.....	36
6.3	WATER STRUCTURE INSPECTIONS.....	36
6.4	WATER MONITORING.....	36

<b>7.0</b>	<b>COMMUNITY COMPLAINT RESPONSE</b> .....	<b>38</b>
<b>8.0</b>	<b>ADAPTIVE MANAGEMENT</b> .....	<b>39</b>
8.1	EXCEEDANCES OF CRITERIA AND/OR PERFORMANCE MEASURES .....	39
8.2	UNFORESEEN IMPACTS .....	39
8.3	FAILURE TO COMPLY WITH OTHER STATUTORY REQUIREMENTS .....	40
8.4	PROVISION OF COMPENSATORY WATER.....	40
<b>9.0</b>	<b>REVIEW AND REPORTING</b> .....	<b>41</b>
9.1	REVIEW .....	41
9.2	REPORTING.....	41
<b>10.0</b>	<b>ACCOUNTABILITIES</b> .....	<b>44</b>
<b>11.0</b>	<b>REFERENCES</b> .....	<b>45</b>
11.1	RELATED DOCUMENTS .....	45
11.2	REFERENCE INFORMATION.....	45
<b>APPENDIX A - EVIDENCE OF CONSULTATION</b> .....		<b>46</b>
<b>APPENDIX B - WMP SUMMARY OF COMMITMENTS</b> .....		<b>70</b>
<b>APPENDIX C - OTHER REQUIREMENTS RELATING TO WATER MANAGEMENT</b> .....		<b>75</b>

**Tables**

Table 1:	Summary of the Approved Wambo Coal Mine .....	3
Table 2:	Water Management Documents Related to this WMP .....	2
Table 3:	DA305-7-2003 Requirements for this WMP .....	10
Table 4:	DA305-7-2003 Water Management Performance Measures .....	14
Table 5:	DA177-8-2004 Water Management Performance Measures .....	16
Table 6:	Water Access and Surface Water Licences.....	17
Table 7:	Groundwater Extraction Licences.....	18
Table 8:	Mining Tenement Conditions relevant to this WMP .....	18
Table 9	Water Categories and Design Criteria .....	28
Table 10:	Summary of Water Storages Managed and Utilised by Wambo .....	29
Table 11:	Water Extraction and Discharge Points .....	33
Table 11:	WMP Accountabilities.....	44
Table 12:	Related Documents .....	45
Table 13:	Reference Information .....	45

**Figures**

Figure 1:	Wambo Coal Regional Location .....	2
Figure 2:	Approved United Wambo Project – Phase 2 .....	1
Figure 3:	Wambo Water Management Plan Structure .....	1
Figure 4:	Wollombi Brook Catchment Context.....	23
Figure 5:	Project Area Catchment Context .....	24
Figure 6:	Location of Alluvium in Lower Reaches of Creeks.....	26
Figure 7:	Water Management System – Managed and Utilised by Wambo .....	32



## Important information about this Water Management Plan

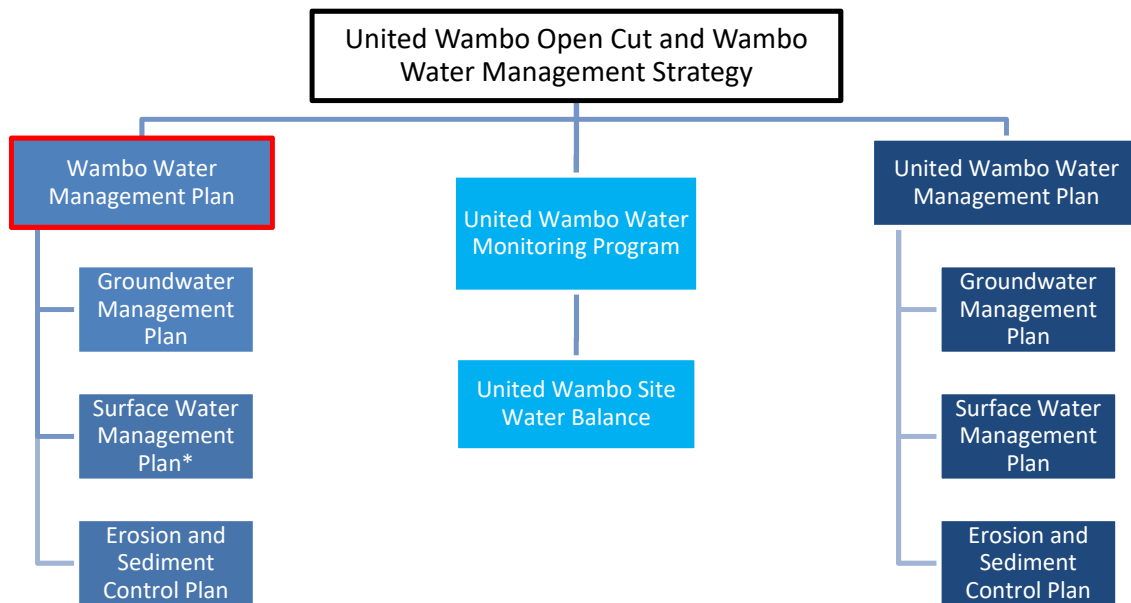
This Water Management Plan (WMP) applies to **Phase 2** mining operations at the Wambo Coal Mine, as defined in the Notification of Modification for Development Approval (DA) 305-7-2003, dated 29 August 2019, i.e.

*The phase of the development that comprises underground mining operations at Wambo underground mine, the operation of Wambo mine infrastructure within the green operational area identified in Figure 2 of Appendix 2 (of DA305-7-2003) and associated surface development.*

The Phase 2 approved operational mining area is shown on Figure 2 (Section 1.3). Water management associated with the United Wambo Open Cut Project is described in the United Wambo Water Management Plan.

The figure below shows the water management documents relevant to this WMP. This WMP sits under the United Wambo Open Cut and Wambo Water Management Strategy (Water Strategy) and includes reference to the combined United Wambo Open Cut and Wambo Water Monitoring Program (WMPProg) and combined United Wambo Open Cut and Wambo Site Water Balance (SWB). This WMP should be read in conjunction with the Wambo WMP sub plans (refer to figure below) and the combined Water Strategy, WMPProg and SWB.

Further detail on how water will be managed across the two operations can be found in the Water Strategy (WA-ENV-MNP-509.7).



**Key:**

- Document applies to both operations – controlled by Wambo Coal Pty Ltd
- Document applies to Wambo Phase 2 operations – controlled by Wambo Coal Pty Ltd
- Document applies to United Wambo Phase 2 operations – controlled by United Wambo JV

\* Wambo SWMP incorporates the North Wambo Creek Diversion Management Plan

## 1.0 Introduction

### 1.1 Background

The Wambo Coal Mine (Wambo) is situated approximately 15 kilometres west of Singleton, near the village of Warkworth, New South Wales (**Figure 1**). Wambo is owned and operated by Wambo Coal Pty Limited (WCPL), a subsidiary of Peabody Energy Australia Pty Limited.

Several open cut and underground mine operations have been conducted at Wambo since mining operations commenced in 1969. Mining under the current Development Consent (DA 305-7-2003) commenced in 2004 and permits both open cut, underground operations and associated activities to be conducted. The latest modification to DA305-7-2003 (Mod 16), approved by the Independent Planning Commission of NSW on 29 August 2019, requires development at Wambo to be undertaken in the following stages:

- Phase 1 - open cut mining operations at Wambo open cut mine, underground mining operations at Wambo underground mine and the operation of Wambo mine infrastructure (including minor upgrades to this infrastructure) within the green operational area identified in Figure 1 of Appendix 2<sup>1</sup>
- Phase 2 - underground mining operations at Wambo underground mine, the operation of Wambo mine infrastructure within the green operational area identified in Figure 2 of Appendix 2<sup>2</sup> and associated surface development
- Phase 3 - following the cessation of underground mining operations that includes mine closure.

The operation of WCPL's rail and coal loading infrastructure is undertaken in accordance with DA177-8-2004. The latest modification to DA177-8-2004 (Modification 3) was approved by the Independent Planning Commission of NSW on 29 August 2019.

The approved run-of-mine (ROM) coal production rate is 14.7 million tonnes per annum (Mtpa) and all product coal is transported from Wambo by rail. A summary of the approved Wambo Coal Mine is provided in **Table 1**.

---

<sup>1</sup> Of DA305-7-2003 (Mod 16)

<sup>2</sup> Of DA305-7-2003 (Mod 16)

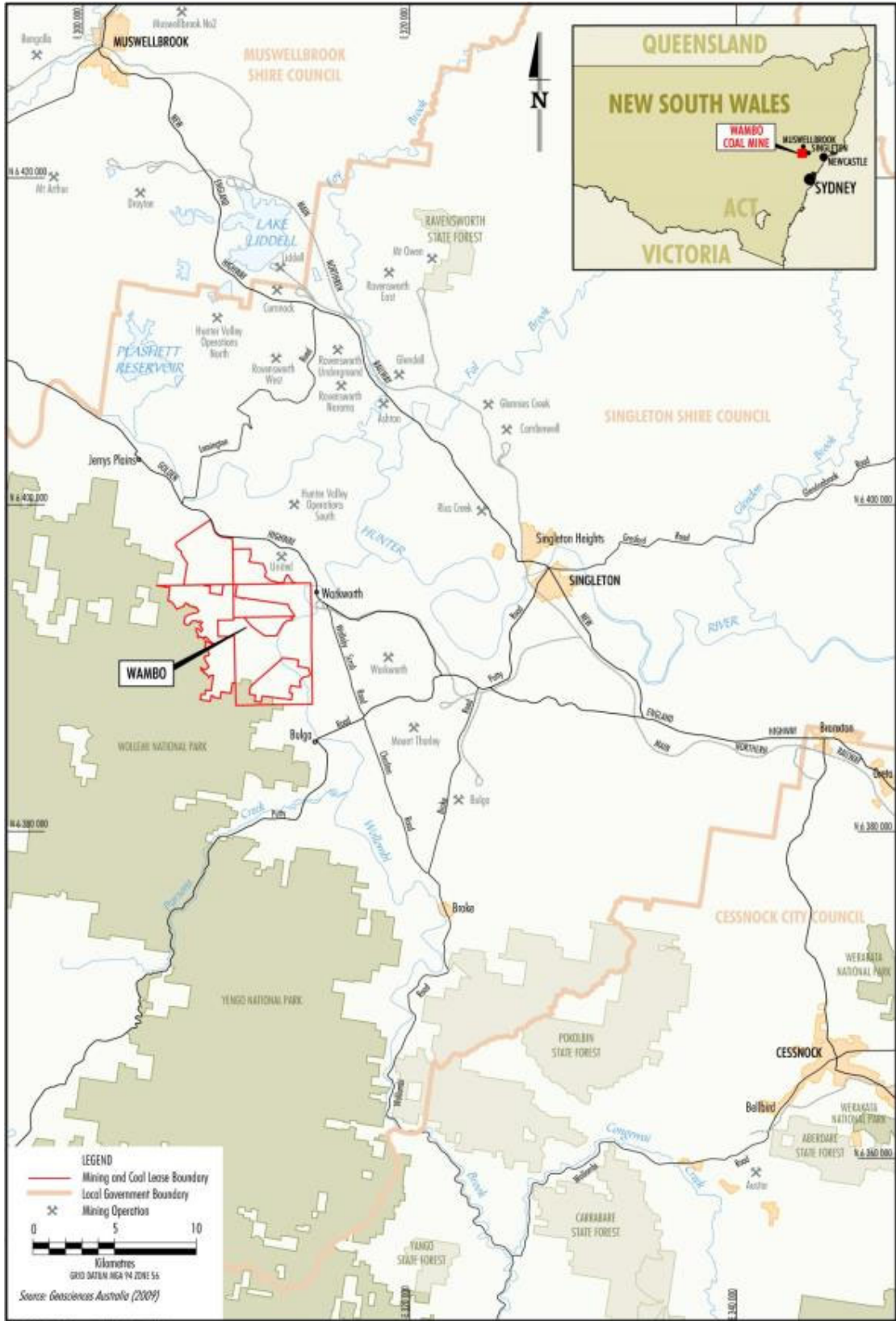


Figure 1: Wambo Coal Regional Location

**Table 1: Summary of the Approved Wambo Coal Mine**

Component	Approved WCPL <sup>1</sup>
Life of Mine	<ul style="list-style-type: none"> <li>38 years (until 31 August 2042).</li> </ul>
Open Cut Mining	<ul style="list-style-type: none"> <li>Open cut mining operations only during Phase 1 activities.</li> </ul>
	<ul style="list-style-type: none"> <li>A maximum of 8 Mt of ROM coal may be extracted from Wambo Open Cut in an any calendar year (during Phase 1)</li> </ul>
	<ul style="list-style-type: none"> <li>An estimated total open cut ROM coal reserve of 98 Mt.</li> </ul>
Underground Mining	<ul style="list-style-type: none"> <li>Underground mining of up to 9.75 Mtpa of ROM coal in any calendar year.</li> </ul>
	<ul style="list-style-type: none"> <li>Underground ROM coal reserves are estimated at 161.3 Mt.</li> </ul>
Subsidence commitments and management.	<ul style="list-style-type: none"> <li>The subsidence impact performance measures listed in Conditions B1 and B4, Schedule 2, Part B of the Development Consent (DA 305-7-2003).</li> </ul>
ROM Coal Production Rate	<ul style="list-style-type: none"> <li>Up to 14.7 Mtpa of ROM coal from the Wambo Mining Complex and United Wambo open cut coal may be processed at the Wambo CHPP in any calendar year.</li> </ul>
Total ROM Coal Mined	<ul style="list-style-type: none"> <li>259.3 Mt.</li> </ul>
Waste Rock Management	<ul style="list-style-type: none"> <li>Waste rock deposited in open cut voids and in waste rock emplacements adjacent open cut operations.</li> </ul>
Total Waste Rock	<ul style="list-style-type: none"> <li>640 million bank cubic metres.</li> </ul>
Coal Washing	<ul style="list-style-type: none"> <li>CHPP capable of processing approximately 1,800 tonnes per hour.</li> </ul>
Product Coal	<ul style="list-style-type: none"> <li>Production of up to 11.3 Mtpa of thermal coal predominantly for export.</li> </ul>
Coal Handling and Preparation Plant Reject Management	<ul style="list-style-type: none"> <li>Coarse rejects and tailings would be incorporated, encapsulated and/or capped within open cut voids (that would comprise part of United's operations during Phase 2).</li> </ul>
Coal Transportation	<ul style="list-style-type: none"> <li>Carried out until 31 August 2042.</li> </ul>
Total CHPP Rejects	<ul style="list-style-type: none"> <li>Approximately 40.3 Mt of coarse rejects and approximately 24.5 Mt of tailings.</li> </ul>
Water Supply	<ul style="list-style-type: none"> <li>Make-up water demand to be met from runoff recovered from tailings storage areas, operational areas, dewatering, licensed extraction from Wollombi Brook and Hunter River.</li> </ul>
Surface Facilities	<ul style="list-style-type: none"> <li>Construction of surface facilities within the approved surface development area.</li> </ul>
Mining Tenements	<ul style="list-style-type: none"> <li>CL 365, CL 374, CL 397, CCL 743, ML 1402, ML 1572, ML 1594, ML1806, , Authorisation (A) 444 and Exploration Licence(EL) 7211.</li> </ul>

**Note to Table 1:** <sup>1</sup> Development Consents DA305-7-2003 and DA177-8-2004 (as modified August 2019)

### 1.1.1 Mining History

Substantial coal mining activity has occurred historically and is continuing currently in the vicinity of Wambo, by a number of companies, with development across several coal seams. Coal is extracted by means of both underground and open cut mining methods. Coal mines neighbouring Wambo include United Colliery to the north and east of Wambo, Mt Thorley Warkworth to the south-east, and a number of open cut and underground mines to the north and east within the Hunter Valley Operations, as shown in **Figure 1**.

Open cut mining at Wambo commenced in 1969. During the 1970s, development consents were issued for a range of open cut and underground mining operations. The Whybrow, Redbank Creek, Wambo and Whynot Seams have primarily been mined by open cut methods at Wambo. The Wambo Seam was also mined for a short period in the Wambo No. 1 Underground Mine, however was abandoned due to hydrological issues. The Whybrow Seam was also mined from the Ridge Underground in this early period.

The Wollemi Underground Mine commenced production in 1997 and was placed under care and maintenance in October 2002 after the available longwall reserves were exhausted. Open cut operations were suspended between March 1999 and August 2001. Following the closure of the Wollemi Underground Mine in October 2002, open cut operations were expanded to maintain an overall production rate of 3 Mtpa of product coal.

Development of the North Wambo Underground Mine (NWU) commenced in November 2005, with longwall operations in the Wambo Seam commencing in October 2007. Longwall extraction at NWU finished in January 2016. Underground mining previously occurred both above and below the Wambo Seam at NWU. The adjacent United Colliery mined the lower Arrowfield Seam until 2010 (United Underground Mine) directly beneath portions of the NWU.

Development of the South Bates Underground Mine (SBU) commenced in October 2014 and longwall mining commenced in the Whybrow Seam (Longwalls 11 to 13) in February 2016. Mining operations progressed to the Wambo Seam (Longwalls 14 to 16) in July 2017. Approval was granted in December 2017 (MOD17) for mining of nine additional longwall panels in the Whybrow seam at the South Bates Extension Underground (Longwalls 17 to 25). Mining commenced in Longwall 17 in December 2018.

## 1.2 Purpose and Objectives

This WMP has been developed to address all water related requirements of DA305-7-2003, DA177-8-2004 and Environment Protection Licence (EPL) 529 as relevant to Phase 2 mining operations at Wambo Coal Mine.

The key objectives of water management at Wambo are to:

- satisfy regulatory requirements, including meeting required performance criteria;
- segregate clean waters from active mining areas, where possible, to reduce the volume of mine affected water requiring subsequent storage and treatment;
- segregate mine impacted water and runoff from undisturbed and revegetated areas with better water quality to minimise the volume of mine impacted water that requires reuse;
- reuse mine impacted water within the water management system (WMS) to reduce reliance on raw/clean water; and
- minimise adverse effects on downstream waterways (including hydraulic and water quality impacts).

The WMP has also been prepared in accordance with Condition D5 of DA305-7-2003.

In recognition of the requirements of Condition B66 (a) of DA305-7-2003, this WMP prepared by WCPL has been reviewed by suitably experienced and qualified persons:

- Mr Chris Bonomini (Umwelt) – Surface Water, Erosion and Sediment Control and Site Water Balance ; and
- Ms Claire Stephenson (SLR Consulting) - Groundwater.

A letter confirming DPIE's endorsement of these experts is provided in **Appendix A**.

### 1.3 Scope

This WMP applies to all Phase 2 operational activities at the Wambo Coal Mine including all underground mining operations, CHPP and train loading operations. It does not apply to open cut mining operations (associated with the United Wambo Open Cut Project) (**Figure 2**).

This WMP addresses the relevant conditions of WCPL's development approvals, EPL 529, water licences and all relevant mining / exploration leases and licences as detailed in **Section 2.0**.

The WMP applies to all employees and contractors working for, or on behalf of, WCPL within the project approval boundary.

This WMP provides the framework for the management of water onsite at Wambo and outlines:

- the water management strategy;
- detailed performance criteria; and
- the United Wambo water balance.

Further information on the relationship between this WMP and other relevant management plans and documents is included in **Section 1.4**.



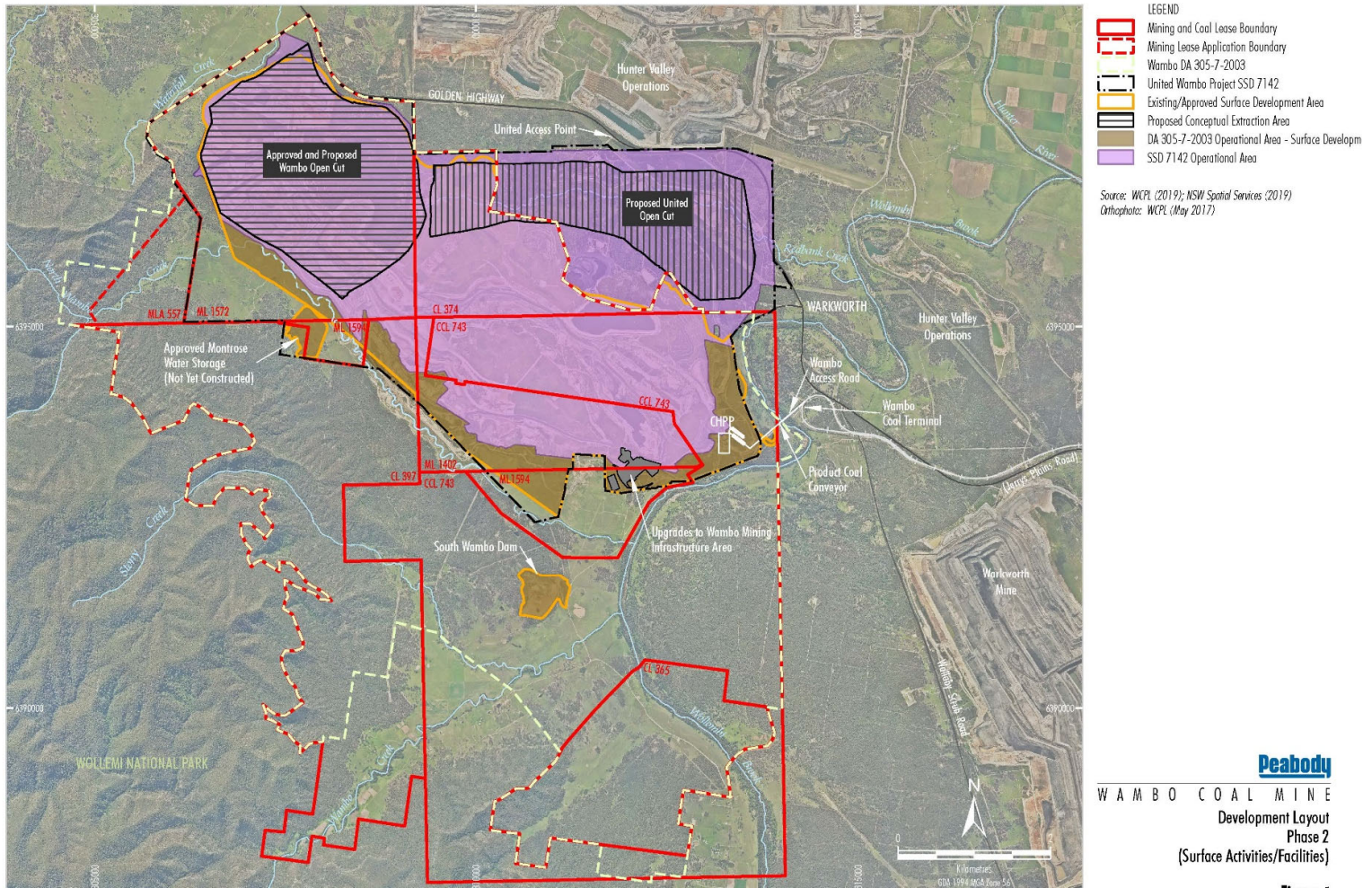
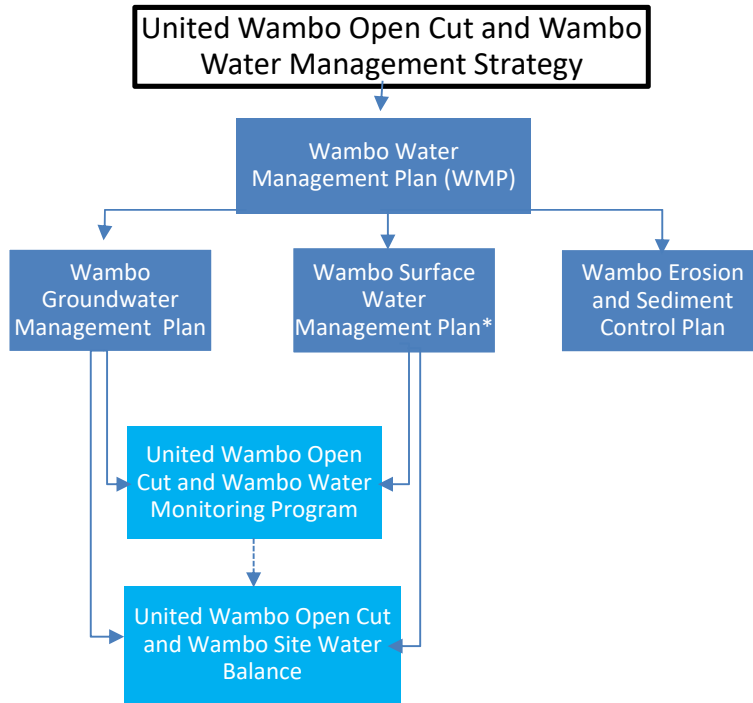


Figure 2: Approved United Wambo Project – Phase 2

## 1.4 Relationship with Other Documents

This WMP is part of a set of documents that have been developed to manage surface and ground water impacts for Wambo. These documents and their relationship to this WMP are shown in **Figure 3** and described in **Table 2**.



**Figure 3: Wambo Water Management Plan Structure**

Notes to **Figure 3**:

- Shared Document with United Wambo Open Cut Operations (refer **Table 2**)
- Wambo Document (refer **Table 2**)
- \* SWMP incorporates the North Wambo Creek Diversion Management Plan (NWCD MP)

This WMP also forms part of WCPL’s Environmental Management System and should be read in conjunction with the Wambo **Environmental Management Strategy (EMS)** (WA-ENV-MNP-501).

All incidents reported at Wambo, including water-related incidents, are managed in accordance with the Wambo **Pollution Incident Response Management Plan (PIRMP)** (WA-ENV-MNP-502).

Mining operations and rehabilitation, including demolition and rehabilitation of water management infrastructure, is detailed in the Wambo **Mining Operations Plan/Rehabilitation Management Plan (MOP/RMP)**.



**Table 2: Water Management Documents Related to this WMP**

Document ID	Document Name	Relationship to this WMP	Applies to	Purpose
WA-ENV-MNP-509.7	United Wambo Open Cut and Wambo Water Management Strategy	Overarching management strategy	United Wambo Open Cut and Wambo	Internal document that describes how water is managed at the mining complex and clearly articulates the relationship between the two Water Management Plans, Water Monitoring Program and Site Water Balance.
WA-ENV-MNP-509.8	United Wambo Open Cut and Wambo Water Monitoring Program	Shared sub plan to WMP	United Wambo Open Cut and Wambo	To clearly document the shared monitoring program and triggers for surface and ground water for the mining complex.
WA-ENV-MNP-509-4	United Wambo Open Cut and Wambo Site Water (SWB) and Salt Balance (SSB)	Shared sub plan to WMP	United Wambo Open Cut and Wambo	To clearly document the site water and salt balances for the mining complex.
WA-ENV-MNP-509-1	Wambo Groundwater Management Plan (GWMP)	Sub plan to WMP	Wambo	To describe how ground water is managed at Wambo.
WA-ENV-MNP-509-2	Wambo Surface Water Management Plan (SWMP)	Sub plan to WMP	Wambo	To describe how surface water is managed at Wambo.
WA-ENV-MNP-509-3	Wambo Erosion and Sediment Control Plan (ESCP)	Sub plan to WMP	Wambo	To describe how erosion and sediment control is managed at Wambo.
WA-ENV-MNP-509-6	North Wambo Creek Diversion Management Plan (NWCD MP)	Appendix to SWMP	Wambo	To describe how the North Wambo Creek Diversion is managed by Wambo.
-	United Wambo Open Cut and Wambo Water Asset Management Plan	Internal management plan	United Wambo Open Cut and Wambo	Internal document that describes how water assets will be managed by Wambo and United Wambo.

#### 1.4.1 Obsolete Plans

Prior to the approval of Modification 16 to DA305-7-2003 WCPL was required to prepare a **Surface and Groundwater Response Plan (SGWRP)**. As the **SGWRP** is no longer required under the modified DA 305-7-2003, relevant information from the **SGWRP** (WA-ENV-MNP-509.4) has been incorporated into the revised **SWMP** and **GWMP**. This includes the Trigger Action Response Plans (TARPs) that were developed in consultation with DPIE Water and DPIE.

In addition, the **North Wambo Creek Diversion Management Plan (NWCD MP)**, which was required under DA305-7-2003 prior to Modification 16, is no longer required. Prior to the approval of Modification 16, WCPL were in the process of updating the **NWCD MP** in consultation with DPIE Water and DPIE. The updated **NWCD MP** (Version 2) was submitted to the DPIE on 28 July 2020. The **NWCD MP** (Version 2) has been appended to the **SWMP**. WCPL may seek to incorporate the content of the **NWCD MP** into the **SWMP** during future revisions of the **SWMP** as the **NWCD MP** is no longer required under the consent.

#### 1.5 Integration with United Water Management System

The water management system for the United Wambo Open Cut Project has been designed to build on the existing United WMS and integrate with the existing water management system at Wambo.

During Phase 2, water management at the Wambo Underground, CHPP, and train loading facilities will continue to be undertaken in accordance with this WMP (as described in **Section 1.4**). Water management at the Wambo Open Cut will be undertaken in accordance with the United Wambo Water Management Plan during Phase 2.

## 1.6 Stakeholder Consultation

As required by Condition B66 of DA 305-7-2003, the WMP must be prepared in consultation with DPIE Water and the EPA, to the satisfaction of the Planning Secretary. A copy of this WMP (including all sub plans) was provided to DPIE Water and the EPA 26 August 2020. The EPA provided correspondence dated 4 September 2020 advising that it is not the role of the EPA to review such plans. No comments were received from DPIE Water/NRAR.

This WMP (and sub plans) has been prepared in consultation with Wambo's technical water experts:

- Mr Chris Bonomini (Umwelt Australia)– Surface Water, Site Water Balance and Erosion and Sediment Control;
- Ms Claire Stephenson (SLR Consulting) – Groundwater; and
- Mr Rohan Lucas (Alluvium) – North Wambo Creek Diversion Management Plan.

Correspondence in relation to the WMP and endorsement of experts is attached as **Appendix A**. A summary of how comments from DPIE Water, the Independent Expert Scientific Committee (IESC) and DPIE have been addressed in previous versions of the WMP is also provided in **Appendix A**.

Version 2 of the WMP was approved by DPIE 20 November 2020.

## 1.7 Summary of Commitments

A Summary of Commitments relating to this WMP is included in **Appendix B**.

## 2.0 Statutory and Other Requirements

### 2.1 Legislation

The main legislation relevant to this WMP (and sub plans) is:

- *Environmental Planning & Assessment Act 1979* (EP&A Act);
- *Protection of the Environment Operations Act 1997* (POEO Act); and
- *Water Act 1912*; and
- *Water Management Act 2000* (WM Act).

Other legislation referenced in this WMP includes the *Mining Act 1992*, *Fisheries Management Act 1994* and *Local Government Act 1993*.

#### 2.1.1 Environmental Planning & Assessment Act 1979

WCPL received Development Consent (DA305-7-2003) in accordance with the EP&A Act from DPIE, formerly NSW Department of Planning and Environment (DP&E), on 4 February 2004. This Consent was for the development of open cut and underground mining operations at the Wambo coal mine. The most recent modification to DA305-7-2003 was granted by the Independent Planning Commission of NSW on 29 August 2019 (Mod 16). DA305-7-2003 stipulates requirements related to this WMP (refer to **Section 2.3.1** and **Appendix C**).

WCPL received Development Consent (DA177-8-2004) in accordance with the EP&A Act from DPIE, formerly NSW Department of Planning and Environment (DP&E), on 16 December 2004. This Consent was for the development of rail and coal loading infrastructure adjacent to the Wambo Coal Mine. The most recent modification to DA177-8-2004 was granted by the Independent Planning Commission of NSW on 29 August 2019 (Mod 3). DA177-8-2004 stipulates requirements related to this WMP (refer to **Section 2.3.2** and **Appendix C**).

#### 2.1.2 Protection of the Environment Operations Act 1997

Activities that do, or may, lead to pollution of waters in NSW are regulated by the NSW Environment Protection Agency (EPA) under the POEO Act. Where discharge of waters is permitted it is strictly controlled by licence conditions such that discharges do not result in significant impacts on water resources.

Wambo operates under EPL No. 529, issued by the EPA under the authority of the POEO Act. Condition L1.1 of EPL 529 (Wambo) requires compliance with Section 120 of the POEO Act, which prohibits pollution of waters.

The EPL stipulates requirements related to this WMP (refer to **Section 2.4**).

All holders of EPLs are required to prepare a Pollution Incident Response Management Plan (PIRMP) in accordance with section 153A of the POEO Act (refer **Section 1.4**).

#### 2.1.3 Water Act 1912

The *Water Act 1912* governs access, trading and allocation of licences associated with both surface and underground water for water sources where a Water Sharing Plan (WSP) has not commenced. The elements to which the *Water Act 1912* applies include extraction of water from a river, extraction of water from underground sources, aquifer interference and capture of surface runoff in dams.

The Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources (NFPR WSP) commenced for the Permian and Triassic hard-rock units on 1 July 2016. WCPL's licences under the *Water Act 1912* have been converted to licences under the *Water Management Act 2000*.

#### **2.1.4 Water Management Act 2000**

The *Water Management Act 2000* (WM Act) is intended to ensure that water resources are conserved and properly managed for sustainable use benefitting both present and future generations. It is also intended to provide formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for protection of catchment conditions.

An amendment to the WM Act (section 60I) came into effect on 1 March 2013. This amendment provides that it is *an offence for a person without an access licence to take, remove or divert water from a water source, or relocate water from one part of an aquifer to another part of an aquifer, in the course of carrying out a mining activity*. Various activities are captured by the provisions of the amendment including mining, mineral exploration and petroleum exploration.

The area covered by this WMP is located within the following Water Sharing Plan (WSP) areas:

- Hunter Unregulated and Alluvial Water Sources 2009 (HUA WSP);
- Hunter Regulated River Water Source 2016 (HRR WSP); and
- North Coast Fractured and Porous Rock Groundwater Sources (NFPR WSP).

Any interference and extraction of surface or ground water throughout the WMP area generally requires a water access licence (WAL) under the WM Act. United and Wambo hold a number of WALs under the WM Act, as described in **Section 2.5**.

##### **2.1.4.1 Hunter Unregulated and Alluvial Water Sources Sharing Plan**

The HUA WSP commenced in August 2009. This WSP regulates the interception and extraction of surface water and alluvium within the Hunter region and is categorised into four extraction management units (EMUs). These EMUs are further broken down into water sources. Wambo is located predominantly within the Lower Wollombi Brook water source.

At the commencement of the WSP (in August 2009), the groundwater (alluvial) entitlement within the Lower Wollombi Brook water source was 5,071 megalitres per year (ML/year) shared between 38 licences. WCPL currently holds one alluvial aquifer licence (WAL 23897, Licence 20AL211371, 70 shares) within the Lower Wollombi Brook water source of the HUA WSP (refer **Section 2.5.1**).

##### **2.1.4.2 Hunter Regulated River Water Source Sharing Plan**

The HRR WSP commenced on 1 July 2016 and covers the Hunter River surface water flows and highly connected alluvials. United Wambo currently hold groundwater licences to abstract 1,306ML/year from the Hunter Regulated River Alluvial water source (Hunter River) (refer **Section 2.5.2**).

### 2.1.4.3 North Coast Fractured and Porous Rock Groundwater Sources

The NFPR WSP commenced on 1 July 2016. This WSP regulates the interception and extraction of water from the Permian and Triassic hard-rock units, including coal seams.

WCPL's licences previously held under the *Water Act 1912* have been converted to licences under the NFPR WSP. WCPL holds 1,647 ML of entitlements under the Sydney Basin North Coast water source. United holds a further 300 ML of entitlements (refer **Section 2.5.2**).

## 2.2 Policies, Guidelines and Standards

The following policies, guidelines and standards are relevant to this WMP (and sub plans):

- *NSW Aquifer Interference Policy 2012* (see **Section 2.2.1**);
- *NSW State Groundwater Policy Framework Document 2007* (see **Section 2.2.2**);
- *Draft Groundwater Monitoring Guidelines for Mine Sites within the Hunter Region* (DIPNR, 2003) (see **Section 2.2.3**);
- *Groundwater Monitoring and Modelling Plans – Information for prospective mining and petroleum exploration activities* (NSW Department of Industry, Water (DPIE Water (formally DPI Water)) 2014) (**Section 2.2.4**);
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) (**Section 2.2.5**);
- *Approved Methods for Sampling and Analysis of Water Pollutants in New South Wales* (DEC, 2004) (**Section 2.2.6**);
- Australian Standard/New Zealand Standard (AS/NZS) 5667:1998 (**Section 2.2.7**);
- Water Reporting Requirements for Mines (DWE Water updated) (**Section 2.2.8**);
- *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom, 2004) and *2E Mines and Quarries* (DECC, 2008), otherwise known as the “Blue Book” (**Section 2.2.9**);
- Minimum Construction Requirements for Water Bores in Australia (NUDLC 2012) (**Section 2.2.10**); and
- *Draft Guidelines for the Design of Stable Drainage Lines on Rehabilitated Mine sites in the Hunter Coalfields* (DIPNR undated) (**Section 2.2.11**).

### 2.2.1 NSW Aquifer Interference Policy

The NSW Aquifer Interference Policy (AIP) was finalised in September 2012 and clarifies the water licensing and approval requirements for aquifer interference activities in NSW, including the taking of water from an aquifer in the course of carrying out mining. Many aspects of this Policy will be given legal effect in the future through an Aquifer Interference Regulation. Stage 1 of the Aquifer Interference Regulation commenced on 30 June 2011.

This Policy outlines the water licensing requirements under the *Water Act 1912* and *WM Act*:

*A water licence is required whether water is taken for consumptive use or whether it is taken incidentally by the aquifer interference activity (such as groundwater filling a void) even where that water is not being used consumptively as part of the activity's operation.*

Under the *WM Act*, a water licence gives its holder a share of the total entitlement available for extraction from the groundwater source. The WAL must hold sufficient share component and water allocation to account for the take of water from the relevant water source at all times.

Sufficient access licences must be held to account for all water taken from a groundwater or surface water source as a result of an aquifer interference activity, both for the life of the activity and after the activity has ceased. Many mining operations continue to take water from groundwater sources after operations have ceased. This take of water continues until an aquifer system reaches equilibrium and must be licensed.

The AIP requires that potential impacts on groundwater sources, including their users and Groundwater Dependent Ecosystems (GDEs), be assessed against minimal impact considerations, outlined in Table 1 of the Policy. If the predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable.

The Level 1 minimal impact considerations for less productive groundwater sources are relevant to the groundwater sources at Wambo and are as follows:

- **Water table:** less than or equal to 10% cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, 40 m from any high priority groundwater dependent ecosystem or high priority culturally significant site listed in the schedule of the relevant WSP. A maximum of a 2 m decline cumulatively at any water supply work unless make good provisions should apply.
- **Water pressure:** a cumulative pressure head decline of not more than 40% of the 'post-water sharing plan' pressure head above the base of the water source to a maximum of a 2 m decline at any water supply work.
- **Water quality:** any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity. For alluvial water sources, there should be no increase of more than 1% per activity in the long-term average salinity in a highly connected surface water source at the nearest point to the activity.

## 2.2.2 NSW State Groundwater Policy

The objective of the *NSW State Groundwater Policy Framework Document* (NSW Government 1997) is to manage the State's groundwater resources so that they can sustain environmental, social and economic uses for the people of NSW. NSW groundwater policy has three component parts:

- NSW Groundwater Quantity Protection Policy;
- NSW Groundwater Quality Protection Policy; and
- NSW Groundwater Dependent Ecosystems Policy.

The principles of the *NSW Groundwater Quantity Protection Policy* include:

- Maintain total groundwater use within the sustainable yield of the aquifer from which it is withdrawn;
- Groundwater extraction shall be managed to prevent unacceptable local impacts; and



- All groundwater extraction for water supply is to be licensed. Transfers of licensed entitlements may be allowed depending on the physical constraints of the groundwater system.

The criteria and management practices developed as part of this document will seek to follow the principles of this policy.

The objective of the *NSW Groundwater Quality Protection Policy* is the ecologically sustainable management of the State's groundwater resources so as to:

- Slow and halt, or reverse any degradation in groundwater resources;
- Direct potentially polluting activities to the most appropriate local geological setting so as to minimise the risk to groundwater;
- Establish a methodology for reviewing new developments with respect to their potential impact on water resources that will provide protection to the resource commensurate with both the threat that the development poses and the value of the resource; and
- Establish triggers for the use of more advanced groundwater protection tools such as groundwater vulnerability maps or groundwater protection zones.

Groundwater triggers will be developed as part of the **GWMP** where they will seek to follow the objectives of this policy.

The *NSW Groundwater Dependent Ecosystem Policy* was designed to protect ecosystems which rely on groundwater for survival so that, wherever possible, the ecological processes and biodiversity of these dependent ecosystems are maintained or restored for the benefit of present and future generations.

### 2.2.3 Draft Groundwater Monitoring Guidelines

The former NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) developed the '*Draft Groundwater Monitoring Guidelines for Mine Sites within the Hunter Region*' in September 2003. This draft guideline is still used by DPIE Water as the benchmark for groundwater monitoring programs at mine sites within the Hunter Region.

### 2.2.4 Groundwater Monitoring and Modelling Plans Guideline

DPI Water developed the '*Groundwater Monitoring and Modelling Plans – Information for prospective mining and petroleum exploration activities*' in February 2014, to assist in the development of Groundwater Monitoring and Modelling Plans. These plans are required as a standard condition of licence for exploration (drilling) under the Mining Act 1992.

Condition B66d(vi) of DA305-7-2003 require WCPL to develop a GWMP that is consistent with this document (refer **GWMP**). The **GWMP** also meets the requirements of Condition 12 of EL7211, which requires the development of a Groundwater Monitoring and Modelling Plan (GWMMP) for EL7211 (refer **Section 2.6**).

### 2.2.5 ANZECC Water Quality Guidelines

The ANZECC Guidelines were prepared in 2000 as part of Australia's *National Water Quality Management Strategy* (NWQMS). These guidelines were updated in 2018 and include recommended criteria or limits for fresh and marine water quality. These criteria have been adopted for some surface water monitoring locations, where baseline data is unavailable. Further detail is provided in the **SWMP**.

## 2.2.6 Approved Methods for Sampling and Analysis of Water Pollutants in NSW

In 2004 the then Department of Environment and Conservation (DEC) published the *Approved Methods for Sampling and Analysis of Water Pollutants in NSW*. This document lists the sampling and analysis methods to be used when complying with the requirements of the POEO Act and regulations.

## 2.2.7 Australian Standard 5667:1998 for Water Quality Sampling

*Australian Standard 5667:1998 Water Quality - Sampling* applies to this WMP (and sub plans). Relevant parts include:

- Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples
- Part 4: Guidance on sampling from lakes, natural and man-made
- Part 6: Guidance on sampling of rivers and streams

## 2.2.8 Water Reporting Requirements for Mines

As part of the water balance monitoring, water imported to site, water used onsite and water discharged from site will be monitored in accordance with *Water Reporting Requirements for Mines* (DWE Water undated). Further detail on water balance monitoring is provided in the **Site Water Balance (SWB)**.

## 2.2.9 The “Blue Book”

WCPL is required to design, install and maintain erosion and sediment controls in accordance with the guidance series *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom, 2004) and *2E Mines and Quarries* (DECC, 2008), otherwise known as the “Blue Book”.

Condition B66(d)(iii) of DA305-7-2003 also requires WCPL to develop an Erosion and Sediment Control Plan (ESCP) that is consistent with the requirements of the Blue Book.

## 2.2.10 Minimum Construction Requirements for Water Bores in Australia

Condition 26 of EL7211 requires that WCPL construct, maintain and decommission all boreholes in accordance with standards equivalent to or exceeding the *Minimum Construction Requirements for Water Bores in Australia* (NUDLC 2012).

## 2.2.11 Draft Guidelines for the Design of Stable Drainage Lines on Rehabilitated Mine Sites in the Hunter Coalfields

The Draft *Guidelines for the Design of Stable Drainage Lines on Rehabilitated Mine sites in the Hunter Coalfields* (DIPNR undated) (Draft Guidelines) provide for the long-term stability of drainage lines on mine sites. Drainage lines require the application of control structures to mitigate against erosion and sediment discharge. The Draft Guidelines outline the elements of drainage design that include specific erosion control techniques and revegetation of areas adjacent to the drainage lines to control soil erosion of spill over areas

WCPL has considered the Draft Guidelines in the preparation of the **ESCP**.



## 2.3 Project Approval

### 2.3.1 DA305-7-2003 Conditions of Consent

DA305-7-2003 requirements related to the development of this WMP are summarised in **Table 3**. Water management performance measures, as specified in Condition B62 of DA305-7-2003, are listed in **Table 4**.

Other conditions within DA305-7-2003 relevant to water management are included in **Appendix C (Table A)**.

**Table 3: DA305-7-2003 Requirements for this WMP**

Condition	Condition Details	WMP Section
B66	The Applicant must prepare a Water Management Plan for the Wambo Mining Complex to the satisfaction of the Planning Secretary. This plan must:	<b>This document</b>
	(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;	<b>Section 1.6 and Appendix A</b>
	(b) be prepared in consultation with DPIE Water and the EPA;	<b>Section 1.6 and Appendix A</b>
	(c) describe the measures to be implemented to ensure that the Applicant complies with the water management performance measures (see Table 8 of DA305-7-2003);	<b>GWMP, SWMP &amp; ESCP</b>
	(d) include a:  (i) Site Water Balance that includes details of: <ul style="list-style-type: none"> <li>• predicted annual inflows and outflows on the site;</li> <li>• sources and security of water supply for the life of the development (including authorised entitlements and licences);</li> <li>• water storage capacity;</li> <li>• water use and management on the site, including any water transfers or sharing with neighbouring mines;</li> <li>• licensed discharge points and limits; and</li> <li>• reporting procedures, including the annual preparation of an updated site water balance;</li> </ul>	<b>Section 5.2 and SWB</b>
	(ii) Salt Balance that includes details of: <ul style="list-style-type: none"> <li>• sources of saline material on the site;</li> <li>• saline material and saline water management on the site;</li> <li>• measures to minimise discharge of saline water from the site; and</li> <li>• reporting procedures, including the annual preparation of an updated salt balance;</li> </ul>	<b>Section 5.3 and SWB (which includes the SSB)</b>

Condition	Condition Details	WMP Section
	<p>(iii) <u>Erosion and Sediment Control Plan</u>, that:</p> <ul style="list-style-type: none"> <li>• is consistent with the requirements of <i>Managing Urban Stormwater: Soils and Construction – Volume 1: Blue Book</i> (Landcom, 2004) and <i>Volume 2E: Mines and Quarries</i> (DECC, 2008);</li> <li>• identifies activities that could cause soil erosion, generate sediment or affect flooding;</li> <li>• describes measures to minimise soil erosion and the potential for the transport of sediment to downstream waters, and manage flood risk;</li> <li>• describes the location, function, and capacity of erosion and sediment control structures and flood management structures; and</li> <li>• describes what measures would be implemented to maintain (and if necessary decommission) the structures over time;</li> </ul>	<p><b>ESCP</b></p>
	<p>(iv) <u>Surface Water Management Plan</u>, that includes:</p> <ul style="list-style-type: none"> <li>• detailed baseline data on surface water flows and quality of watercourses and/or water bodies potentially impacted by the development, including: <ul style="list-style-type: none"> <li>○ stream and riparian vegetation health;</li> <li>○ channel stability (geomorphology); and</li> <li>○ water supply for other surface water users;</li> </ul> </li> <li>• a detailed description of the surface water management system;</li> <li>• detailed plans, design objectives and performance criteria for water infrastructure, including: <ul style="list-style-type: none"> <li>○ any approved creek diversions or restoration works associated with the development;</li> <li>○ water run-off diversions and catch drains;</li> <li>○ water storages and sediment dams;</li> <li>○ emplacement areas and tailings storages; and</li> <li>○ reinstated drainage networks on rehabilitated areas of the site;</li> </ul> </li> <li>• detailed performance criteria, including trigger levels for identifying and investigating any potentially adverse impacts associated with the development, on: <ul style="list-style-type: none"> <li>○ downstream surface water flows and quality Including Wollombi Brook, North Wambo, South Wambo, and Stony Creeks);</li> <li>○ channel stability;</li> <li>○ downstream flooding impacts;</li> <li>○ stream and riparian vegetation health;</li> <li>○ water supply for other water users; and</li> <li>○ post-mining water pollution from rehabilitated areas of the site;</li> </ul> </li> <li>• a program to monitor: <ul style="list-style-type: none"> <li>○ compliance with the relevant performance measures</li> </ul> </li> </ul>	<p><b>SWMP and WMPProg</b></p>

Condition	Condition Details	WMP Section
	<p>listed in Table 8 and the performance criteria established above;</p> <ul style="list-style-type: none"> <li>○ controlled and uncontrolled discharges and seepage/leachate from the site;</li> <li>○ surface water inflows, outflows and storage volumes to inform the Site Water Balance;</li> <li>○ impacts on water supply for other users; and</li> <li>○ the effectiveness of the surface water management systems and the measures within the Erosion and Sediment Control Plan;</li> </ul> <ul style="list-style-type: none"> <li>● reporting procedures for the results of the monitoring program; and</li> <li>● a plan to respond to any exceedances of the performance measures or performance criteria, and repair, mitigate and/or offset any adverse surface water impacts of the development;</li> </ul>	
	<p>(v) <u>Groundwater Management Plan</u>, which is consistent with <i>Groundwater Monitoring and Modelling Plans – Introduction for prospective mining and petroleum activities</i> (DPI Water, 2014) and includes:</p> <ul style="list-style-type: none"> <li>● detailed baseline data of groundwater levels, yield quality for groundwater resources and groundwater dependent ecosystems potentially impacted by the development, including groundwater supply for other water users;</li> <li>● a detailed description of the groundwater management system;</li> <li>● groundwater performance criteria, including trigger levels for identifying and investigating any potentially adverse groundwater impacts associated with the development, on: <ul style="list-style-type: none"> <li>○ regional and local aquifers (alluvial and hardrock);</li> <li>○ groundwater supply for other water users such as privately-owned licensed groundwater bores; and</li> <li>○ groundwater dependent ecosystems;</li> </ul> </li> <li>● a program to monitor and evaluate: <ul style="list-style-type: none"> <li>○ compliance with the relevant performance measures listed in Table 8, and the performance criteria established above, including monitoring of regional groundwater levels and quality during the life of the development and at least 10 years post-mining;</li> <li>○ water loss/seepage from water storages into the groundwater system (particularly from South Wambo Dam and Montrose East Dam);</li> <li>○ groundwater inflows, outflows and storage volumes to inform the Site Water Balance;</li> <li>○ any hydraulic connectivity between the alluvial and hardrock aquifers;</li> <li>○ impacts on groundwater dependent ecosystems;</li> <li>○ impacts on groundwater supply for other water users; and</li> <li>○ the effectiveness of the groundwater management systems;</li> </ul> </li> <li>● reporting procedures for the results of the monitoring program;</li> <li>● a plan to respond to any exceedances of the groundwater performance criteria, and repair, mitigate, compensate and/or</li> </ul>	<p><b>GWMP and WMPProg</b></p>

Condition	Condition Details	WMP Section
	<p>offset any adverse groundwater impacts of the development; and</p> <ul style="list-style-type: none"> <li>a program to periodically validate the groundwater model for the development, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions; and</li> </ul>	
	(vi) a protocol to report on the measures, monitoring results and performance criteria identified above, in the Annual Review referred to in condition D10.	<b>Section 9.0</b>
D5	<p><b>Management Plan Requirements</b></p> <p>The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include where relevant:</p>	<b>Section 2.2</b>
	(a) summary of relevant background or baseline data;	<b>Section 3.0 (see also SWMP, GWMP &amp; ESCP)</b>
	(b) details of: <ul style="list-style-type: none"> <li>the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> </ul>	<b>Section 2.0 and Appendix C</b>
	<ul style="list-style-type: none"> <li>any relevant limits or performance measures and criteria;</li> </ul>	<b>Table 4 and Table 5 (see also SWMP, GWMP &amp; ESCP)</b>
	<ul style="list-style-type: none"> <li>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;</li> </ul>	<b>Refer SWMP, GWMP &amp; ESCP</b>
	(c) any relevant commitments or recommendations identified in the document/s listed in condition A2(c);	<b>Section 2.3.2</b>
	(d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	<b>Entire document (see also SWMP, GWMP &amp; ESCP)</b>
	(e) a program to monitor and report on the: <ul style="list-style-type: none"> <li>impacts and environmental performance of the development; and</li> <li>effectiveness of any management measures set out pursuant to paragraph (d);</li> </ul>	<b>Monitoring - Section 6.0 (see also SWMP, GWMP &amp; ESCP)</b> <b>Reporting - Section 9.0</b>
	(f) 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;	<b>Section 8.0. See also SWMP, GWMP &amp; ESCP</b>
	(g) a program to investigate and implement ways to improve the environmental performance of the development over time;	<b>Section 9.0</b>
	(h) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>incident, non-compliance or exceedance of any impact assessment criterion and performance criterion;</li> </ul>	<b>Section 9.0</b> <b>Section 9.0</b>
	<ul style="list-style-type: none"> <li>complaint; or</li> </ul>	<b>Section 7.0</b>
	<ul style="list-style-type: none"> <li>failure to comply with other statutory requirements; and</li> </ul>	<b>Section 9.0</b>

Condition	Condition Details	WMP Section
	(i) a protocol for periodic review of the plan.	Section 9.1
	Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	Noted

**Table 4: DA305-7-2003 Water Management Performance Measures**

Feature	Performance Measure <sup>1</sup>	WMP Section
Water management – general	<ul style="list-style-type: none"> <li>Maintain separation between clean, dirty and mine water</li> <li>Minimise the use of clean and potable water</li> <li>Maximise water recycling, reuse and sharing opportunities</li> <li>Minimise the use of make-up water from external sources</li> <li>Design, install, operate and maintain water management infrastructure in a proper and efficient manner</li> </ul>	Section 4.1 See also SWMP, GWMP & ESCP
Alluvial aquifers (including Wollombi Brook alluvium and excluding North Wambo Creek alluvium)	<ul style="list-style-type: none"> <li>Negligible impacts beyond those predicted in the document/s listed in condition A2(c), including:               <ul style="list-style-type: none"> <li>negligible change in groundwater levels;</li> <li>negligible change in groundwater quality; and</li> <li>negligible impact to other groundwater users</li> </ul> </li> </ul>	GWMP
Erosion and sediment control works	<ul style="list-style-type: none"> <li>Design, install and maintain erosion and sediment controls in accordance with the guidance series <i>Managing Urban Stormwater: Soils and Construction – Volume 1</i> (Landcom, 2004) and <i>2E Mines and Quarries</i> (DECC, 2008)</li> <li>Design, install and maintain any infrastructure within 40 metres of watercourses in accordance with the guidance series for <i>Controlled Activities on Waterfront Land</i> (DPI Water, 2012)</li> <li>Design, install and maintain any creek crossings generally in accordance with the <i>Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management</i> (DPI, 2013) and <i>Why Do Fish Need To Cross The Road? Fish Passage Requirements for Waterway Crossings</i> (NSW Fisheries, 2003)</li> </ul>	SWMP & ESCP
Clean water diversions and storage infrastructure	<ul style="list-style-type: none"> <li>Design, install and maintain the clean water system to capture and convey the 100 year ARI flood event</li> <li>Maximise, as far as reasonable, the diversion of clean water around disturbed areas on the site, except where clean water is captured for use on the site</li> </ul>	SWMP
Sediment dams	<ul style="list-style-type: none"> <li>Design, install and maintain sediment dams in accordance with the guidance series <i>Managing Urban Stormwater: Soils and Construction – Volume 1</i> (Landcom, 2004) and <i>2E Mines and Quarries</i> (DECC, 2008)</li> </ul>	SWMP & ESCP

Feature	Performance Measure <sup>1</sup>	WMP Section
Above-ground mine water storages	<ul style="list-style-type: none"> <li>Design, install and maintain mine water storage infrastructure to avoid unlicensed or uncontrolled discharge of mine water</li> </ul>	SWMP
Prescribed dams under the Dams Safety Act 1978 or Dams Safety Act 2015 (including South Wambo Dam)	<ul style="list-style-type: none"> <li>Design, constructed and operated to the satisfaction of DSC</li> <li>Drained prior to the commencement of secondary workings in underlying longwalls, to the satisfaction of DSC</li> </ul>	Section 5.1.6
Tailings storages	<ul style="list-style-type: none"> <li>Design and maintain tailings storage areas to encapsulate and prevent the release of tailings seepage/leachate</li> </ul>	Section 4.1.3
Overburden emplacements	<ul style="list-style-type: none"> <li>Design, install and maintain emplacements to encapsulate and prevent migration of tailings, acid forming and potentially acid forming materials, and saline and sodic material</li> <li>Design, install and maintain out-of-pit emplacements to prevent and/or manage long term saline seepage</li> </ul>	Section 4.1.3
Chemical and hydrocarbon storage	<ul style="list-style-type: none"> <li>Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standard</li> </ul>	Section 5.1.8
Creek diversion and restoration works (including the North Wambo Creek Diversion)	<ul style="list-style-type: none"> <li>Diverted creek lines are hydraulically and geomorphologically stable in the long term</li> <li>Incorporate erosion control measures based on vegetation and engineering revetments</li> <li>Incorporate persistent/permanent pools for aquatic habitat</li> <li>Revegetate with suitable native species</li> </ul>	SWMP (NWCD MP)
Aquatic, riparian and groundwater dependent ecosystems	<ul style="list-style-type: none"> <li>Negligible environmental consequences beyond those predicted in the document/s listed in condition A2(c)</li> <li>Maintain or improve baseline channel stability</li> <li>Develop site-specific in-stream water quality objectives in accordance with the <i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality</i> (ANZECC &amp; ARMCANZ, 2000) and <i>Using the ANZECC Guidelines and Water Quality Objectives in NSW</i> (DEC, 2006)</li> </ul>	SWMP

Note:

- The performance measures in **Table 4** do not apply to water management structures constructed prior to the approval of Modification 16 (to DA305-7-2003).

### 2.3.2 DA177-8-2004 Conditions of Consent

There are no specific requirements in DA177-8-2004 for the development of a WMP however conditions relevant to water management with DA177-8-2004 have been addressed in this WMP. These conditions, and where they have been addressed in this WMP, are included in **Appendix C (Table B)**.

Water management performance measures, as specified in Condition B9 of DA177-8-2004, are listed in **Table 5**.

**Table 5: DA177-8-2004 Water Management Performance Measures**

Feature	Performance Measure	WMP Section
Water management – general	<ul style="list-style-type: none"> <li>• Maintain separation between clean, dirty and mine water</li> <li>• Minimise the use of clean and potable water</li> <li>• Maximise water recycling, reuse and sharing opportunities</li> <li>• Design, install, operate and maintain water management infrastructure in a proper and efficient manner</li> </ul>	<b>Section 4.1</b> <b>See also SWMP, GWMP &amp; ESCP</b>
Sediment dams	<ul style="list-style-type: none"> <li>• Design, install and maintain sediment dams in accordance with the guidance series <i>Managing Urban Stormwater: Soils and Construction – Volume 1</i> (Landcom, 2004) and <i>2E Mines and Quarries</i> (DECC, 2008) and the requirements under the POEO Act or <i>Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002</i>.</li> </ul>	<b>SWMP &amp; ESCP</b>
Chemical and hydrocarbon storage	<ul style="list-style-type: none"> <li>• Chemical and hydrocarbon products to be stored in bunded areas in accordance with the relevant Australian Standard</li> </ul>	<b>Section 5.1.8</b>
Above-ground storage tanks containing materials likely to cause environmental harm	<ul style="list-style-type: none"> <li>• Imperviously bunded with a capacity of 110% that of the largest container stored within the bund</li> <li>• Designed and constructed in a manner which prevents the ingress of rainwater into the tanks</li> <li>• Clearly labelled to identify content</li> </ul>	<b>Section 5.1.8</b>

### 2.3.3 2016 EA Commitments

There are a number of commitments relating to water management and monitoring within the following documents:

- *United Wambo Open Cut Coal Mine Project Environmental Impact Statement* (Umwelt, 2016);
- *United Wambo Open Cut Coal Mine Project Surface Water Assessment* (Umwelt, 2016a); and
- *United Wambo Open Cut Coal Mine Project Groundwater Impact Assessment* (AGE, 2016).

These commitments relate to the United Wambo Open Cut Mine Project, however some of them are relevant to the shared water monitoring program and site water balance. For reference these commitments are summarised in **Appendix C (Table C)**. Further detail on how these commitments have been met is provided in the **WMPProg** and **SWB**.

### 2.3.4 Independent Environmental Audit Recommendations

In 2017 Hansen Bailey conducted an Independent Environmental Audit of the Wambo Coal Mine, in accordance with the requirements of Condition D11 of DA305-7-2003 and DA177-8-2004 (Hansen Bailey, 2018). Recommendations from the audit report relating to this WMP, and where they are addressed, are contained in **Appendix C (Table D)**.

## 2.4 Environment Protection Licence 529

Under EPL 529, Wambo may discharge water into the Hunter River system in accordance with the Hunter River Salinity Trading Scheme (HRSTS) through a designated Licenced Discharge Point (LDP). The HRSTS is a cap-and-trade system designed to facilitate saline discharges into the Hunter River by its many industrial and agricultural users, without compromising sustainable water quality. The HRSTS is administered under the *Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002*.

There is currently one LDP in the Wambo EPL 529. As of July 2020, Wambo currently holds 51 credits under the HRSTS.

The EPL 529 conditions relevant to this WMP are included in **Appendix C (Table E)**.

## 2.5 Water Licences

### 2.5.1 Water Access and Surface Water Licences

As discussed in **Section 2.1.3**, United and Wambo hold a number of WALs under the WM Act for the HRR WSP and HUA WSP. **Table 6** presents the WALs held by United and Wambo.

WCPL will report performance against relevant surface water licence conditions in the Annual Review (refer **Section 9.2.1**).

**Table 6: Water Access and Surface Water Licences**

Licence No	Water Source	Category	Holder	Share Component (units)	Tenure Type
WAL718	Hunter Regulated River Water Source	Regulated River (High Security)	Wambo	1000	Continuing
WAL8599	Hunter Regulated River Water Source	Regulated River (High Security)	Wambo	6	Continuing
WAL8600	Hunter Regulated River Water Source	Regulated River (General Security)	Wambo	868	Continuing
WAL8604	Hunter Regulated River Water Source	Supplementary Water	Wambo	240	Continuing
WAL10541	Hunter Regulated River Water Source	Regulated River (High Security)	United	300	Continuing
WAL1369	Hunter Regulated River Water Source	Regulated River (Supplementary)	Wambo and United	15	Continuing
WAL15459	Hunter Regulated River Water Source	Regulated River (General Security)	Wambo and United	21	Continuing
WAL18445	Hunter Unregulated and Alluvial Water Sources (Lower Wollombi Brook Water Source)	Unregulated River	United	200	Continuing



Licence No	Water Source	Category	Holder	Share Component (units)	Tenure Type
WAL18549	Hunter Unregulated and Alluvial Water Sources (Lower Wollombi Brook Water Source)	Unregulated River	United	100	Continuing
WAL18437	Hunter Unregulated and Alluvial Water Sources (Lower Wollombi Brook Water Source)	Unregulated River	Wambo	350	Continuing
WAL 23897	Hunter Unregulated and Alluvial Water Sources (Lower Wollombi Brook Water Source)	Aquifer	Wambo	70	Continuing

## 2.5.2 Groundwater Licences

United and Wambo also hold WALs under the WM Act for the NFPR WSP, for the operation of groundwater extraction. **Table 7** presents the WALs held by United and Wambo.

WCPL will report performance against relevant groundwater licence conditions in the Annual Review (refer **Section 9.2.1**).

**Table 7: Groundwater Extraction Licences**

Licence No	Description	Category	Holder	Share Component (units)	Tenure Type
WAL 42373 <sup>1</sup>	Dewatering bores	Aquifer	Wambo	1549	Continuing
WAL41532	Dewatering	Aquifer	Wambo	98	Continuing
WAL41510	Dewatering	Aquifer	United	300	Continuing

1. Consolidated licence including WALs 39735, 39738, 39803, 41494, 41528 and 41520.

WCPL also holds a number of licences for groundwater monitoring bores under the *Water Act 1912*. Details of groundwater monitoring bores are included in the **GWMP**. Monitoring of these bores is included in the **WMP**.

## 2.6 Mining Tenements and Exploration Licences

Mining operations and exploration activities at Wambo must be operated in accordance with the conditions of various mining tenements and exploration licences/authorities (refer to the **MOP/RMP** for more detail). Conditions relevant to water management and where they are addressed in this WMP are summarised in **Table 8**.

**Table 8: Mining Tenement Conditions relevant to this WMP**

Tenement/ Licence	Condition No	Condition Description	WMP Section
EL7211 <sup>1</sup>	10	<b>Erosion and sediment control</b> The licence holder must prevent erosion and pollution of watercourses resulting from the conduct of prospecting	<b>ESCP</b>

Tenement/ Licence	Condition No	Condition Description	WMP Section
		operations by implementing effective erosion and sediment control measures.	
EL7211 <sup>1</sup>	11	The planning, design and construction of erosion and sediment control measures must be conducted generally in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (DECC 2007), as amended or replaced from time to time.	ESCP
EL7211 <sup>1</sup>	12	<p><b>Groundwater Monitoring and Modelling Plan</b> Prior to conducting prospecting operations involving the construction and use of boreholes, the licence holder must:</p> <ul style="list-style-type: none"> <li>a) Prepare a Groundwater Monitoring and Modelling Plan in consultation with the NSW Office of Water;</li> <li>b) Ensure the Groundwater Monitoring and Modelling Plan: <ul style="list-style-type: none"> <li>i. describes methods for identifying aquifers, their depths, behaviour, containing layers and connectivity with surrounding aquifers or surface water systems;</li> <li>ii. describes methods for collection of data relevant to the type, quantity and quality of water contained within aquifer systems likely to be encountered during prospecting operations;</li> <li>iii. provides for the future development of a conceptual model of regional groundwater behaviour;</li> <li>iv. provides for the future development of a calibrated computer model of regional groundwater behaviour, to enable the impacts of any proposed mining operations to be assessed;</li> <li>v. describes how records of all data collected will be maintained;</li> <li>vi. describes the staging process for implementation of the plan; and</li> <li>vii. is prepared in accordance with any additional requirements prescribed by the Secretary.</li> </ul> </li> <li>c) The Groundwater Monitoring and Modelling Plan must address the requirements identified in b)i) and b)vii) in a level of detail commensurate with the scale, timing and potential impact of the proposed operations;</li> <li>d) have the Groundwater Monitoring and Modelling Plan approved by the Minister; and</li> <li>e) Implement and comply with the approved Groundwater Monitoring and Modelling Plan.</li> </ul>	GWMP
EL7211 <sup>1</sup>	26	<p><b>Drilling</b> The licence holder must:</p> <ul style="list-style-type: none"> <li>a) Construct, maintain and decommission all boreholes and petroleum wells in accordance with standards equivalent to or exceeding the <i>Minimum Construction Requirements for Water Bores in Australia</i> (NUDLC 2012), as amended or replaced from time to time. Where this condition is inconsistent with other conditions set out in this exploration licence, those conditions prevail to the extent of that inconsistency.</li> <li>b) Ensure that the construction, operation, maintenance and decommissioning of boreholes does not cause or enhance: <ul style="list-style-type: none"> <li>i. hydraulic connection between aquifers;</li> <li>ii. contamination or cross-contamination of aquifers;</li> <li>iii. the escape of natural or noxious gases;</li> <li>iv. the uncontrolled surface discharge of ground waters;</li> </ul> </li> </ul>	Sections 2.2.10 & 5.1.7 and GWMP

Tenement/ Licence	Condition No	Condition Description	WMP Section
		v. collapse of the surrounding surface; or vi. hazards to persons, stock and wildlife.	
		e) Contain all drill cutting, fluids and groundwater returned to the surface as part of the drilling process in above-ground tanks or in-ground sumps pending recirculation or disposal. In-ground sumps must be lined with an impermeable barrier where there is a potential risk of contamination from drill cuttings or fluids;	<b>GWMP and SWMP</b>
EL7211 <sup>1</sup>	39	<b>Rehabilitation</b> The licence holder must ensure that all water land and wetland crossings that are disturbed during prospecting operations are rehabilitated such that the natural flow of water is unimpeded and bank stability is maintained to prevent erosion.	<b>SWMP</b>
ML1594, ML1572 & CL374	15	<b>Exploratory Drilling</b> c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of any groundwaters;	<b>GWMP</b>
		e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.	<b>GWMP</b>
ML1594, ML1572 & CL374	16	<b>Prevention of Soil Erosion and Pollution</b> Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan.  For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	<b>SWMP</b>
CCL743 & ML1402	17	<b>Exploratory Drilling</b> b) iii) all drill holes are permanently sealed with cement plugs to prevent surface discharge of any groundwaters;	<b>GWMP</b>
		b) v) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.	<b>GWMP</b>
CCL743 & ML1402	18	<b>Prevention of Soil Erosion and Pollution</b> Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan.  For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.	<b>SWMP</b>

1. EL7211 is expected to be handed over to the United Wambo Open Cut late 2020

## 3.0 Baseline Data

### 3.1 Existing Environment

The existing environment is described in detail in the EIS (Umwelt 2016) and summarised with respect to water in the sections below.

#### 3.1.1 Rainfall

Wambo is located in the Upper Hunter Valley near the NSW township of Jerry's Plains. The area experiences a dry temperate to sub-tropical climate with hot humid summers and cool drier winters. The annual average rainfall is some 650 mm.

#### 3.1.2 Geological Setting

The Permian age Wittingham Coal Measures comprise economic coal seams in the project area, along with overburden and interburden consisting of sandstone, siltstone, tuffaceous mudstone, and conglomerate. The coal measures plunge in a general west to south-westerly direction, with the Wittingham Coal Measures outcropping to the north and east of the project area, near the Hunter River. The Permian sediments are unconformably overlain by thin Quaternary alluvial deposits. These deposits consist of silt, sand and gravel in the alluvial floodplain of the Wollombi Brook. To the east of the Wollombi Brook is a sequence of aeolian sands, known as the Warkworth Sands Formation, that form a thin capping on the underlying Permian bedrock.

The Permian coal measures are also unconformably overlain by the Triassic Narrabeen Group, which formed from uplift during the Triassic. The Narrabeen Group comprises primarily consolidated sandstone that form the ridge lines and high plateau areas within the Wollemi National Park.

Surficial weathering occurs across the project area. The weathering profile is typically present as a thin heterogeneous layer of unconsolidated and highly weathered material (regolith) overlying fresh bedrock.

The following main stratigraphic units occur within the project area and immediate surrounds (from youngest to oldest):

- Quaternary sediments (alluvium);
- Triassic Narrabeen Group;
- Permian Newcastle Coal Measures; and
- Permian Wittingham Coal Measures.

#### 3.1.3 Topography and Vegetation

The project area is gently undulating, with elevation ranging between 60 m Australian Height Datum (AHD) in the east and 215 m AHD in the west. Outside of the project area, the topography grades into the flat alluvial lands associated with the adjacent water courses (50 m AHD to 60 m AHD) and rises to between 300 m AHD and 650 m AHD toward the Wollemi National Park escarpment to the west.

Due to historical farming and mining, the majority of the project area is cleared of vegetation. Wollemi National Park is densely vegetated with various plant communities, including open forests dominated by eucalypt species.

### 3.1.4 Surface Water Catchment Context

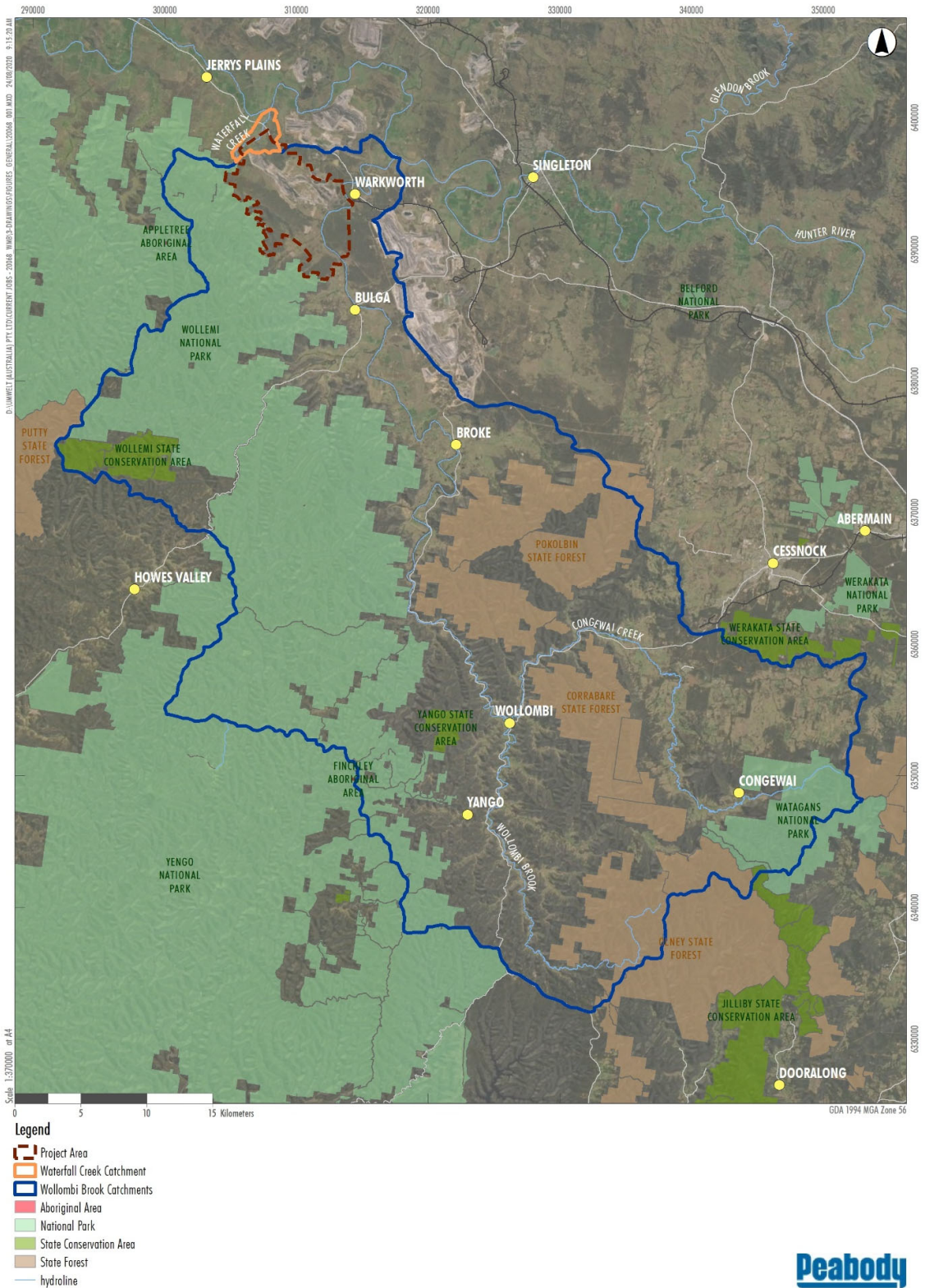
The mine site is within the lower Wollombi Brook catchment near its confluence with the Hunter River. Wollombi Brook drains an area of approximately 1,950 km<sup>2</sup> (Gilbert and Associates, 2003) and joins the Hunter River some 5 km north- east of Wambo (**Figure 4**).

Surface runoff from the majority of land within the WCPL's project area drains to Wollombi Brook via a series of generally easterly flowing creeks including South and North Wambo Creek, Stony Creek, Waterfall Creek and Redbank Creek. South Wambo Creek and its main tributary Stony Creek rise in the Wollemi National Park escarpment south of the mine and drain the southern and south-western parts of the mining lease area. Waterfall Creek drains the north end of the mining lease area. Relatively smaller parts of the northern side of the site drain to Redbank Creek in the United Collieries lease area (**Figure 5**).

North Wambo Creek, which also has its headwaters in the Wollemi escarpment, drains the central parts of the mining lease. A section of North Wambo Creek has been diverted to avoid the Wambo open cut (**Figure 5**). The North Wambo Creek Diversion was constructed in 2008, accordance with the approved North Wambo Creek Diversion Plan (WCPL, 2007b).

Further detail on sub-catchment sizes as well as detailed baseline data for surface water flows and quality in the vicinity of Wambo is presented in the **SWMP**.





**Figure 4: Wollombi Brook Catchment Context**



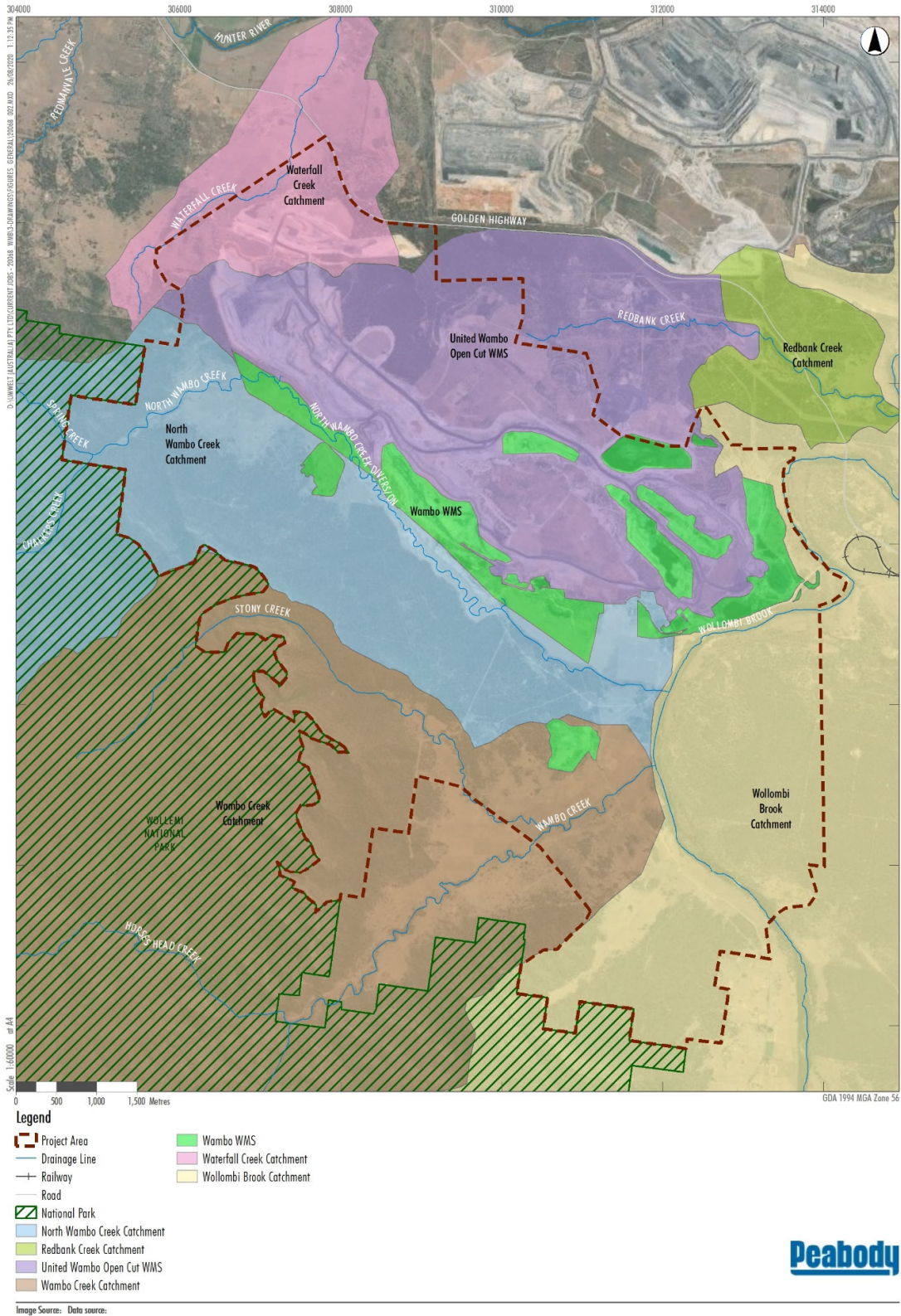


Figure 5: Project Area Catchment Context

### 3.1.5 Hydrogeology

The hydrogeological regime of the Wambo area and surrounds comprises two main systems (HydroSimulations, 2014):

- Quaternary alluvial aquifer system of channel fill deposits associated with Wollombi Brook, North Wambo Creek, Wambo Creek and Stony Creek.
- Underlying Permian strata consisting of:
  - hydrogeologically “tight” and hence very low yielding to essentially dry sandstone and lesser siltstone; and
  - low to moderately permeable coal seams, which are the prime water-bearing strata within the Permian measures.
- Triassic Narrabeen Group described as:
  - Unconformably overlying the Permian coal measures and comprising lithic to quartzose sandstone, conglomerate, mudstone and siltstone. The Narrabeen Group is not present in the mine disturbance footprint but does form the ridges and high plateau within Wollemi National Park.

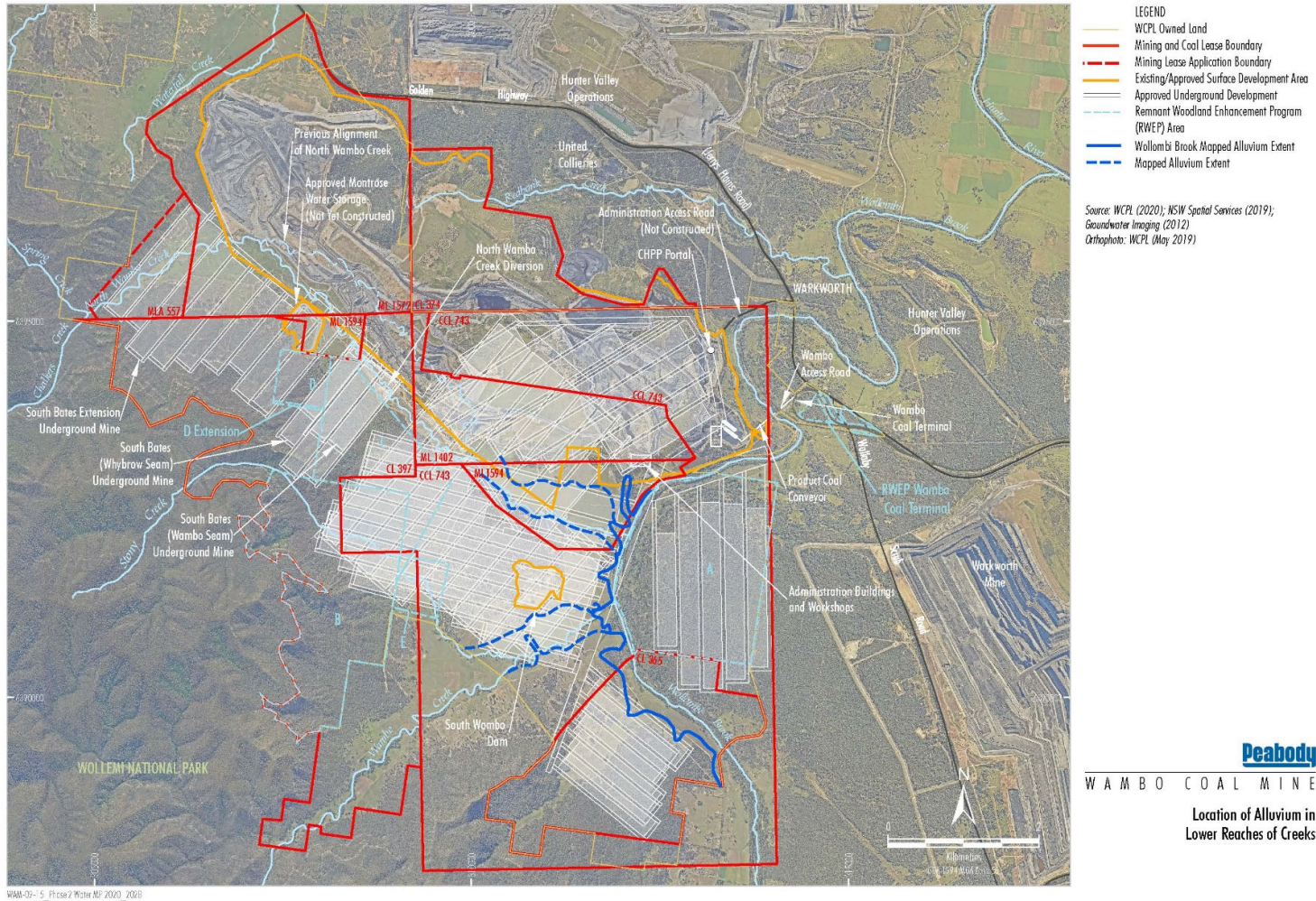
#### 3.1.5.1 Quaternary Alluvium

The alluvium in the vicinity of the Wambo forms an unconfined shallow aquifer. The alluvium within the Wambo area is generally less than 15 m thick (Heritage Computing, 2012). Previous studies indicate that the alluvium of Wambo Creek is 4 to 7 m deep and is discontinuous, probably due to bedrock highs (HLA-Envirosciences, 1999). The alluvium of North Wambo Creek near its confluence with Wollombi Brook was found to vary between 7 and 19 m (GHD, 2007). The extent of alluvium interpreted from the TEM study is typically of a narrower alluvial body along both the lower reaches of (South) Wambo Creek and North Wambo Creek than is mapped in the publicly available mapping (HydroSimulations, 2014) (refer **Figure 6**).

A section of North Wambo Creek has been diverted to skirt the Wambo Open Cut. Groundwater conditions within the North Wambo Creek alluvium have been locally altered by historical and existing mining operations, including removal of alluvium with progression of open cut mining (Montrose Pit).

Based on a review of groundwater quality and the results of the search of the NSW Bore Database (refer **GWMP**) the typical yield of the alluvial aquifer is likely to be less than 5 litres per second (L/s) and the salinity varies from low to very high. Based on this information the environmental value of the alluvial groundwater is considered to be ‘primary industry’ (specifically stock watering) and potentially irrigation.





### 3.1.5.2 Permian Groundwater Sources

The fractured and porous groundwater sources within the Permian strata consist of both the coal seams and the interburden layers. The Permian strata includes the Wittingham Coal Measures intersected at site, and the overlying Newcastle Coal Measures.

Groundwater flow in the coal measures is influenced by the local geomorphology and structural geology, with unconfined conditions where the coal measures occur at outcrop, becoming confined as they dip towards the south-west. Pre-mining regional groundwater flow is generally towards the north-east. The regolith is variably saturated and shows unsaturated groundwater conditions. Previous and ongoing open cut and underground mining within the Wambo area and adjoining mining operations has resulted in a regional zone of depressurisation within the Permian coal measures (HydroSimulations, 2020).

The permeability of the fresh Permian coal measures is generally low and decreases with depth. This is due to tightening of joints between rock units as depth increases. The coal seams generally have higher permeability than the interburden layers. Overall, the Permian groundwater sources are low yielding and brackish to saline. The weathered coal measures (regolith) show variable permeability dependent on the insitu material (i.e. siltstone, sandstone, conglomerate). Water quality within the regolith is variable dependent on recharge sources, including rainfall recharge and upward seepage from underlying fresh Permian coal measures.

Detailed baseline data with regard to groundwater levels and quality in the vicinity of the project is presented in the **GWMP**.

## 3.2 Baseline Monitoring Data

Baseline monitoring data for surface and ground water is included in the **SWMP** and **GWMP**.

## 4.0 Planning

### 4.1 Water Management Types

Wambo categorises water into three types to effectively manage water and to mitigate any potential for environmental harm to occur. Each type of water requires different management measures to minimise the risk of contamination of downstream drainage systems. A description of the water quality and potential sources for the three categories of water are summarised in **Table 9**.

**Table 9 Water Categories and Design Criteria**

Water Category	Description	Target Design Criteria
Clean Water	Runoff from undisturbed or rehabilitated areas.	Intercept, convey and/or release, where practicable, to downstream environment.
Dirty Water	Runoff from disturbed areas, such as active overburden emplacement areas or overburden emplacement areas where vegetation is not fully established.	Managed in line with the Blue Book ( <i>Managing Urban Stormwater: Soils and Construction Volume 1 and Volume 2E</i> ).
Mine Water	Water exposed to coal or used in coal processing and runoff within mining infrastructure areas or coal stockpile areas. Mine water includes water associated with groundwater inflows into open cut pits.	Mine water storages to have sufficient freeboard to contain runoff for events up to and including the 1% 24 hour AEP (annual exceedance probability) storm event.

#### 4.1.1 Clean Water Management

The existing clean water management system includes a series of clean water drains and dams around the perimeter of operational areas in order to minimise the volume of runoff from the upstream catchments entering the surface facilities. Clean water controls will be augmented with the construction of new drains and dams as required to accommodate any changes to the surface facilities disturbance footprint (increase or decrease).

#### 4.1.2 Dirty Water Management

Runoff from areas disturbed by mining (including the CHPP) is collected in open cuts and mine water storages. These storages are used as priority sources of water for the CHPP and dust suppression. Runoff from haul roads is treated in sediment traps or is diverted to mine water storages. Runoff from rehabilitated and establishing revegetated mine areas is directed to sediment retention storages. These are either allowed to drain to local drainages or, depending upon the water quality, are directed to mine water storages.

Additional information on the management of dirty water and a table showing the water control structures at Wambo is contained within the **ESCP** and **SWMP**.

#### 4.1.3 Mine Water Management

Mine water will be contained in storages (including open cut pits or sumps and underground voids). The water management system is designed to minimise the risk of discharges of mine water to downstream watercourses.

Tailing storage areas will be suitably designed, installed and maintained to encapsulate and prevent the migrating of tailings seepage offsite. Oil-water separators treat water exposed to hydrocarbons within the infrastructure areas.



## 5.0 Implementation

### 5.1 Water Management System

The site water management strategy for Wambo and United Wambo is based on the containment and re-use of mine water and on the control of sediment that may be potentially carried with runoff from disturbed areas such as the waste rock emplacements. The water management system (WMS) controls waters generated from development and operational areas while diverting upstream water around such areas. It includes both permanent structures that will continue to operate post-closure and temporary structures that will only be required until the completion of rehabilitation works. The WMS includes:

- Up-catchment diversion structures;
- Water storage dams;
- Sediment dams;
- Water transfer infrastructure (i.e. pumps and pipelines);
- Licenced Discharge Points; and
- The North Wambo Creek Diversion.

The WMS operates predominately as a closed, self-contained system. The water balance of the system fluctuates with climatic conditions and as the extent of the mining operations evolves over time.

CHPP tailings are currently discharged to the Homestead Inpit Tailings Dam and from Q1 2021 will be discharged into a new facility constructed within the Homestead Main Pit. Water liberated from the settled tailings is pumped from the decant location to various water storages for reuse primarily by the CHPP. An extensive reticulation system has been developed to transfer water between open cuts, underground operations and mine water storages, to source water from Wollombi Brook and the Hunter River, to facilitate controlled releases to Wollombi Brook (in accordance with EPL 529 and the Hunter River Salinity Trading Scheme) and to provide water to the adjacent United Collieries operation. A schematic of the WMS is provided in the **SWB**.

The available water sources and the relatively large surface and underground storage capacity for mine water have provided Wambo and Wambo United with significant flexibility to manage the water system.

#### 5.1.1 Wambo Water Management Strategy

The water management strategy for Wambo includes all underground operations (South Bates and South Bates extension) including South Bates Pit, as well as all tailings storage facilities and water storages, as shown on **Figure 7** and in **Table 10**.

Table 10: Summary of Water Storages Managed and Utilised by Wambo

Storage	Max Operational Volume (ML)
Main Homestead In-pit tailings dam <sup>1</sup>	600
Eagles Nest	80
South Dam <sup>2, 3</sup>	500
CHPP Dams (including Gordon Below Franklin)	82

Storage	Max Operational Volume (ML)
C11 Void <sup>3</sup>	340
West Cut Dam	35
Roses Pit Sump	35
Admin Boxcut	80
South Bates Sump	35
Glen Munro Boxcut Sump	120
Underground Workings (including United, Wambo Workings, South Bates and South Bates Extended)	>8,000 <sup>3</sup>

1. Scheduled to be decommissioned in 2021
2. To be recommissioned in 2021, subject to approval
3. Capacity, not operational volume

Excess water from both the United Wambo Open Cut and Wambo underground will be discharged via the Wambo licensed discharge points in accordance with Wambo EPL 529 under the HRSTS. The *Wambo Coal Water Asset Management Plan* sets out the schedule and plans of the complex water assets.

### Dirty and Mine Water

Runoff from rehabilitation areas at Wambo will be captured via a series of drains and dams constructed in accordance with the *ESCP*. The dams will be dewatered to the major water storages. Erosion and sediment controls will be implemented as required for all proposed disturbance areas.

Wambo will manage the water associated with the following tailings storage facilities (TSF):

- North East Tailings Dam;
- Hunter Pit Tailings Dam;
- Homestead Main Pit TSF; and
- South Bates Pit TSF (proposed for future storage)

### 5.1.2 Additional Water Management Infrastructure

Water is transferred around the site using pump and pipeline infrastructure. The pipeline network is dynamic and may change over time based on need and location of mining and in-pit water.

Where possible, all sections of mine water pipelines will run through mine water catchments so that any leaks in the pipes in these areas will flow into mine water storages.

In the event that a dirty or mine water pipeline is located in a clean water catchment, additional controls will be implemented to mitigate offsite discharges. Differential flow meters or pressure sensors will be installed to detect potential losses. This system is to be linked by telemetry to readily detect and mitigate potential pipeline failure incidents. The system will cease pumping at a pre-defined trigger level, which minimises spillage risk.

Pipelines should be buried across creeks and drainage lines and should be double skinned or sleeved to minimise physical damage and/or to contain potential leakages. Where burial is not practical or for existing pipelines that are suspended across creeks, measures are to be implemented to confirm that they are to be adequately supported to prevent damage from creek flows and or flood debris.

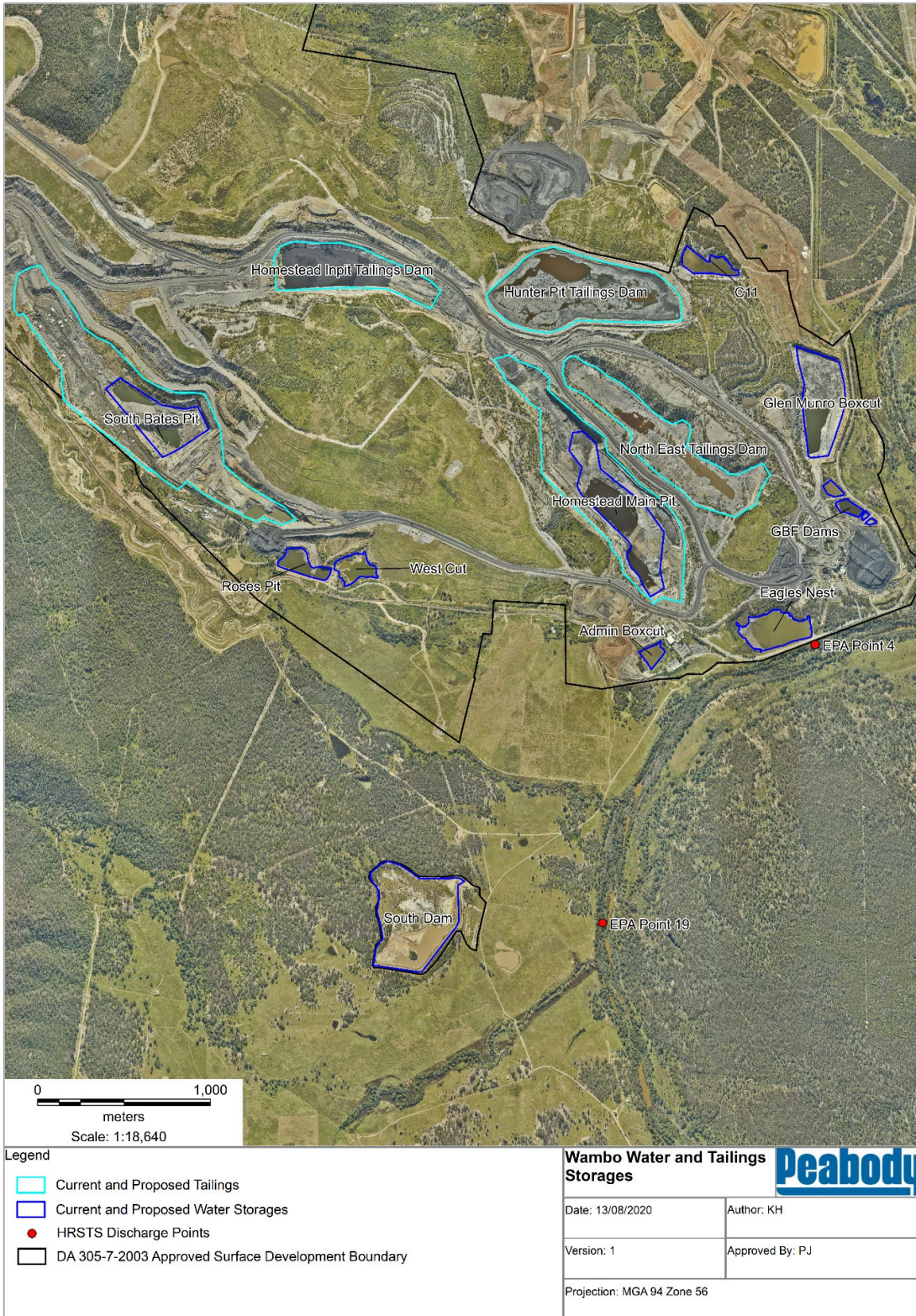
### 5.1.3 Erosion and Sediment Controls

Erosion and sediment control measures at Wambo will be implemented and undertaken in accordance with the **ESCP**.

The objective of the **ESCP** will be to ensure that appropriate structures and programs of work are in place to:

- Identify activities that could cause erosion and generate sediment;
- Describe the location, function and capacity of erosion and sediment control structures required to minimise soil erosion and the potential for transport of sediment downstream;
- Ensure erosion and sediment control structures are appropriately maintained;
- Fulfil the statutory conditions of the project approval; and
- Meet the requirements of the Blue Book (Landcom 2004 and DECC 2008) and the Draft *Guidelines for the Design of Stable Drainage Lines on Rehabilitated Mine sites in the Hunter Coalfields* (DIPNR undated).





**Figure 7: Water Management System Managed and Utilised by Wambo**

#### 5.1.4 Water Extraction and Discharges

Water will be extracted from the Hunter River and Wollombi Brook as required and approved under the existing WALs (refer **Section 2.5.1**). Surplus water will be discharged as required and in accordance with EPL 529 and consistent with the provisions of the HRSTS. Discharges will be monitored prior to release to ensure compliance with the requirements of the HRSTS and in accordance with EPL conditions. Details of the extraction and discharge points are listed in **Table 11**, including planned future points. This table does not include Erosion and Sediment Control discharge points.

**Table 11: Water Extraction and Discharge Points**

Identification	Capacity (ML/day)	Type	Existing or Planned
Hunter River Pump	6.5 – 8.4	Extraction	Existing
Wollombi Brook Pump	8	Extraction	Existing
Bore BH2A	2.3	Extraction	Existing
Bore DW4C (Arrowfield Seam – United Workings)	8	Extraction	Existing
HRSTS - Eagles Nest	70	Discharge	Existing
HRSTS – South Dam	250	Discharge	Planned

#### 5.1.5 Water Transfers

A key objective of the Wambo water management system is to allow for water sharing between the United and Wambo operations to optimise the overall water balance through maximising water recycling, minimising external water demand and water discharge and to provide operational flexibility. The water management system outlined in **Section 5.1.1** has been designed to facilitate this. Water can also be imported from and exported to United Wambo water management system and the neighbouring Mt Thorley Warkworth (MTW) and Hunter Valley Operations (HVO). Water will be imported and exported on an as needs basis subject to commercial agreements.

#### 5.1.6 Prescribed Dams

WCPL has three prescribed dams onsite:

- Wambo Hunter Pit Tails Dam;
- South Wambo Dam (currently decommissioned); and
- North East Tailings Dam.

Hunter Pit and North East Tailings Dam are operated and maintained in accordance with an Operations and Maintenance Manual (OMM) and a Dam Safety Emergency Plan (DSEP). If/when South Wambo Dam is recommissioned, an OMM and DSEP will be developed and implemented in line with the requirements of the Dams Safety Act 2015.

Further information on the inspections and management of Prescribed dams is included in the **SWMP**.

#### 5.1.7 Decommissioning

Decommissioning of boreholes will be undertaken in accordance with standards equivalent to or exceeding the *Minimum Construction Requirements for Water Bores in Australia* (NUDLC 2012). Further information on decommissioning of bores is included in the **GWMP**.



Rehabilitation objectives and strategies for the decommissioning of water management structures including dams is included in the **SWMP**.

### 5.1.8 Hydrocarbon and Chemical Management

Any chemical and hydrocarbon products are stored in bunded areas in accordance with the relevant Australian Standards.

Above-ground storage tanks containing materials likely to cause environmental harm will be:

- Imperviously bunded with a capacity of 110% that of the largest container stored within the bund;
- Designed and constructed in a manner which prevents the ingress of rainwater into the tanks; and
- Clearly labelled to identify content.

## 5.2 Site Water Balance

The site water balance model was revised by Jacobs in 2020 and includes both the United Wambo Open Cut and the Wambo Underground, CHPP and rail facility. Inflows to the water balance included groundwater flows from the open cuts and underground. The average groundwater flow was predicted to be 256 ML/year from the open cuts and 505 ML/year from the underground.

Further detail on the site water balance is included in the **SWB**.

The site water balance will be recalculated on an annual basis and reported in the Annual Review (**Section 9.2.1**).

## 5.3 Site Salt Balance

A site salt balance has been developed as an extension of the site water balance for Wambo (refer **Section 5.2**). The salt balance model allows the salt load and salinity of water to be predicted, which is an important consideration for the management of water on-site. Given the integrated nature of the United Wambo and Wambo water management systems, the water balance assessment has included consideration of water use and make in the Wambo and United pits as well as the Wambo underground, CHPP and train loading facility.

Salt transfers were simulated within the site water balance model in parallel with the water transfers. The site salt balance provides the expected salt loads and concentration of salt associated with each water transfer within the model.

Further detail on the site salt balance is included in the **SWB**.

The site salt balance is reviewed on an annual basis, in association with the review of the site water balance, and the results are reported in the Annual Review (refer **Section 9.2.1**).

## 5.4 Groundwater Model

Several groundwater models have been constructed within the Wambo area to simulate the stresses on the groundwater environment from mining activities i.e. Wambo, Mt Thorley Warkworth and Hunter Valley Operations (HVO) models. The most recent modelling prepared for WCPL is based on the HydroSimulations (2016a) model that was developed as part of the groundwater assessment for the South Bates Underground Mine Modification (MOD 12)

application (HydroSimulations, 2016a) and was subsequently used for the South Bates Extension Modification (Modification 17 in July 2017) (HydroSimulations 2017)..

Numerical modelling was undertaken to inform the Groundwater Assessments detailed above and to quantify the likelihood and magnitude of potential impacts. On each occasion the Groundwater Assessment was peer reviewed by Kalf and Associates (Dr Frans Kalf) who concluded that the hydrogeological description, conceptualisation, model design, simulations and reporting had been conducted in a professional manner.

More recently groundwater modelling has been undertaken to inform the Wambo GDE Study (HydroSimulations, 2019) and the South Bates Extension Extraction Plan for Longwalls 21-24 (SLR, 2020). The hydrogeological model predicts the lateral zone of impact of depressurisation of aquifers due to current and future mining activity. In addition, the hydrogeological model predicts groundwater inflows into the underground workings over the life of the mine.

Periodic re-calibration of the model will be undertaken based on observed piezometric heads and groundwater inflow data. This periodic review and recalibration of the groundwater model is being undertaken by SLR for completion in Q4 2020.

Results from monitoring undertaken as part of the **WMP** will be compared to groundwater model predictions, as part of the Annual Review process (refer **Section 9.2.1**). As required by Condition B66 (v) of DA305-7-2003, Wambo will implement a program to periodically validate the groundwater model, including an independent review of the model every three years, and comparison of monitoring results with model predictions (refer **Section 9.1.2**). This process will be coordinated by Wambo and reported on in the Annual Review.

Further detail on the groundwater model is included in the **GWMP**.

## 5.5 Security of Supply

Wambo receives water from rainfall and catchment runoff captured in surface storages, groundwater inflows, water imported from other mines and licenced extraction from boreholes, the Hunter River and Wollombi Brook.

The water balance model will be updated throughout the mine life to forecast supply reliability as part of the water management planning process. In the event of reductions in the forecast reliability due to low rainfall conditions, water conservation measures (such as the use of synthetic dust suppressants) will be implemented.

## 5.6 Training and Communication

Regular workforce communication days and toolbox talks allow for discussion of the objectives and requirements of this and any other relevant Plans.

Selected site personnel whose duties directly involve the management of water at Wambo will undertake specific training in regards to site operational procedures which incorporate water management measures. This training will be undertaken annually and when there is a change in personnel in key roles.

## 6.0 Measurement and Evaluation

### 6.1 Site Water and Salt Balance

WCPL has developed a separate document to address the requirements of DA305-7-2003 and SSD 7142 relevant to the site water and salt balance for both operations i.e. the **SWB**.

The **SWB** provides information on:

- the United Wambo Water Management System;
- sources of water;
- water use;
- the water balance model;
- the salt balance;
- review and reporting requirements; and
- responsibilities for site personnel specific to the water balance.

Both operations will monitor rainfall, water usage, fresh water imported to site, the transfers of water around site and the volume of water stored in designated storages on the site.

The monitoring data is used to update the site water balance annually and track water inventory. The results from the site water balance are reported in the Annual Review.

### 6.2 Groundwater Inflows

As part of the ongoing water balance monitoring the groundwater inflows to the mining pits and underground will be reviewed monthly. This will be undertaken by review of available data (including flow metering data or pump hours, site daily rainfall data and site survey data) to estimate groundwater inflows to the mining operations.

Groundwater inflows will be compared to predicted inflows as outlined in the **GWMP**.

### 6.3 Water Structure Inspections

Routine inspections of water structures, including dams, drop structures, diversion drains and erosion and sediment control structures, as well as inspections following significant rainfall events, will be conducted by Wambo personnel. Water structures are inspected to assess the capacity, structural integrity and effectiveness and identify any maintenance requirements.

Further detail is presented in the **ESCP**.

The frequency of pipeline inspections will be determined through risk assessment, however all major operational pipelines and high risk pipelines are to be inspected weekly when in use, as a minimum. Minor pipelines and low risk pipelines within the mine containment system are to be inspected on a risk based approach. Inspections are also to be completed prior to commissioning or recommissioning a pipeline. Inspection frequency is risk based depending on water quality being transferred and the environment in which the pipeline is located.

### 6.4 Water Monitoring

Water monitoring is undertaken on key water storages and receiving waterways around Wambo. Refer to the **SWMP** and **WMPprog** for further detail.

Water monitoring is undertaken for groundwater levels and quality as part of the groundwater monitoring program. Refer to the **GWMP** and **WMPprog** for further detail.

Monitoring results are reported in the Annual Review (refer **Section 9.2.1**) and made available on the WCPL website.



## **7.0 Community Complaint Response**

All water related community complaints received by WCPL will be recorded within the Community Complaints Register. The Environment and Community (E&C) Manager (or delegate) will investigate the complaint, which will include, where possible, contacting the complainant within 24 hours to discuss the complaint. A review of the effectiveness of the corrective or preventative actions will be conducted within a month of the complaint and the relevant work procedures updated if required.

Preliminary investigations will commence as soon as practicable upon receipt of a complaint to establish if WCPL is responsible. All efforts will be made to determine the likely causes contributing to the complainant's concerns.

WCPL will address the complainant's concerns such that a mutually acceptable outcome is achieved. If a mutually beneficial outcome cannot be reached, WCPL may refer the matter to the Planning Secretary for resolution.

Details of all community complaints will be included in the Monthly Environment Monitoring Report. WCPL will retain a copy of the Community Complaints Register for at least four years. The Community Complaints Register is posted on the WCPL website.

## 8.0 Adaptive Management

Potential water-related impacts are detailed in the *Wambo Development Project Environmental Impact Statement (EIS)* (Wambo Coal, 2003), various Environmental Assessments associated with Development Consent Modifications including the recent *United-Wambo Project Environmental Assessment* (Umwelt, 2016).

This WMP has been developed to manage and monitor water-related risks associated with the Wambo underground mining operations, to minimise the likelihood of exceedances of the criteria and/or performance measures detailed in the relevant development approvals and licences.

### 8.1 Exceedances of Criteria and/or Performance Measures

If an exceedance of these criteria and/or performance measures occurs, WCPL will, at the earliest opportunity:

- Take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;
- Undertake an investigation into the cause of the exceedance and contributing factors. This investigation may involve collaboration with personnel at the United Wambo Open Cut Operations, depending on the nature, location and potential cause of the exceedance;
- Consider all reasonable and feasible options for remediation (where relevant) and submit a report to DPIE describing those options and any preferred remediation measures or other course of action; and
- Implement remediation measures as directed by the Planning Secretary, to the satisfaction of the Planning Secretary.

### 8.2 Unforeseen Impacts

In the event that any unforeseen surface water or ground water impacts are detected, the following general response procedure will be initiated:

- Check and validate the data/information which indicates an unforeseen impact;
- Notify DPIE, EPA and other relevant agencies immediately after becoming aware of the impact;
- In the event of an apparently anomalous monitoring result, conduct a resample/retest where possible;
- Review the unforeseen impact, including consideration of:
  - Any relevant monitoring data; and
  - Current mine activities and land management practices in the relevant catchment, including other mining activities;
- Commission an investigation by an appropriate specialist into the unforeseen impact;
- Provide a preliminary investigation report to DPIE, EPA and relevant agencies within 7 days of identifying the unforeseen impact;
- Implement appropriate contingency/remedial measures;
- Implement additional monitoring to measure the effectiveness of the mitigation measures, where necessary;

- Communicate results of investigation and subsequent contingency and remedial measures to government agencies as required; and
- Review and update the WMP and resubmit to DPIE.

### 8.3 Failure to Comply with Other Statutory Requirements

Statutory requirements relating to this WMP are summarised in **Section 2.0** and **Appendix C** as well as in the related sub plans i.e. **SWMP**, **GWMP** and **ESCP**.

These requirements include compliance with development approvals (DA305-7-2003 & DA177-8-2004), EPL 529, various water licences and mining tenements.

WCPL monitors compliance with these statutory requirements on an ongoing basis, including during regular reviews and reporting of monitoring data and as part of Annual Reviews and compliance audits (e.g. Independent Environmental Audits).

In the event that WCPL identifies a failure to comply with a statutory requirement (other than those relating to unpredicted impacts – refer **Section 8.2**), WCPL will:

- Undertake an investigation into the failure;
- Identify suitable strategies or actions to be implemented to address the failure (and avoid a recurrence of the failure); and
- Report the non-compliance in accordance with the requirements of the development consent.

### 8.4 Provision of Compensatory Water

WCPL is required to provide a compensatory water supply to any landowner of privately-owned land whose rightful water supply is adversely and directly impacted (other than an impact that is minor or negligible) as a result of the development, in consultation with DPIE Water, and to the satisfaction of the Planning Secretary.

In the event that WCPL receives a complaint from a landholder regarding their water supply, WCPL will investigate the complaint to determine if the impact was caused by WCPL's mining operations. If this can be proven, WCPL will consult with DPIE Water on appropriate compensatory water supply arrangements, in accordance with Conditions B56 – B59 of DA305-7-2003.

## 9.0 Review and Reporting

### 9.1 Review

#### 9.1.1 Environmental Performance

WCPL's environmental performance is reviewed annually by the WCPL E&C Manager (or delegate) and reported on as part of the Annual Review process (refer **Section 9.2.1**).

#### 9.1.2 Validation of Predictions

Every year the site water balance, surface and ground water take will be validated by comparing predicted results to monitoring results collected over the life of the development. This will be undertaken as part of the Annual Review process (refer **Section 9.2.1**).

In accordance with Condition B66 (v) WCPL will periodically validate the groundwater model and commission an independent review of the model every three years. A comparison of monitoring results with modelled predictions will also be undertaken. Further detail on the groundwater model is included in the **GWMP**.

#### 9.1.3 Management Plan Review

This WMP and associated documents will be reviewed in accordance with DA305-7-2003 and the **EMS**. A full review will be undertaken prior to new underground mining areas being developed and/or within three months of:

- the submission of an Annual Review;
- the submission of a water-related incident report;
- the submission of an Independent Environmental Audit: or
- any modification to the conditions of consent (unless the conditions require otherwise).

The review process is also to reflect changes in environmental legislation and guidelines and changes in technology or operational procedures. If any significant modifications to the WMS are required as an outcome of the review, relevant government agencies will be consulted regarding the changes and the revised Plan will be submitted to DPIE for approval by the Secretary within 6 weeks.

### 9.2 Reporting

#### 9.2.1 Annual Review

The WCPL E&C Manager will be responsible for reporting any significant findings regarding the implementation of this WMP in the WCPL Annual Review. The report will include:

- any amendments to licensing or statutory approvals;
- a summary of any complaints or incidents relating to the performance of the Water Management System over the reporting period;
- a summary of monitoring results collected over the reporting period and assessment against the relevant performance measures and criteria;
- a summary of water extracted from Wollombi Brook and the Hunter River during the relevant water reporting period/s;
- an evaluation of any trends in monitoring results over the life of the operation;
- any non-compliance recorded during the reporting period and the actions taken to rectify the non-compliance and avoid recurrence;

- identification of any discrepancies between the predicted and actual impacts of United Wambo and an analysis of the potential cause of any significant discrepancies; and
- a summary of the management actions to be implemented over the next year to improve the environmental performance of the site.

In accordance with Condition B53 of DA305-7-2003 WCPL will also report on water extracted or discharged from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.

Yearly reporting of the water level and quality results from the monitoring network will be included in the Annual Review. An experienced hydrogeologist will review measured water levels and determine when water levels deviate significantly from that predicted by the groundwater model and determine the reason for this deviation. The review will consider the impact of mining, and other factors that could result in declining water levels including climatic conditions, rainfall recharge and pumping from private (and mine owned) bores.

Future annual groundwater monitoring reviews will comment on the interaction/connectivity of the open cut and underground area and on the degree of match of the predicted versus observed water levels. This information will be included in each Annual Review.

The Annual Review will also identify if any additional monitoring sites are required, or if optimisation of the existing monitoring sites, frequency of sampling and analytical suites should be undertaken.

The WCPL Annual Review will be provided to DPIE and other relevant agencies prior to the end of March each year. A copy of the Annual review will also be made available on the WCPL website.

### **9.2.2 EPL Annual Return**

WCPL will prepare and submit an Annual Return in the approved form comprising a certified Statement of Compliance and a signed Monitoring and Complaints Summary to the EPA at the end of each EPL reporting period.

The Annual Return for the reporting period will be supplied to the EPA by registered post not later than 60 days after the end of each reporting period. WCPL will retain a copy of the Annual Return for a period of at least four years after the Annual Return was due to be supplied to the EPA.

The sewage treatment system maintenance program required by Condition O2.6 of EPL 529 (refer **SWMP**) will be submitted annually to the EPA with the Annual Return.

### **9.2.3 HRSTS Reporting**

WCPL will compile a written report of the activities under the HRSTS for each scheme year i.e. 1 July to 30 June. The written report will be submitted to the EPA's regional office within 60 days after the end of each scheme year and will be in a form and manner approved by the EPA. The information will be used by the EPA to compile an annual scheme report.

### **9.2.4 Reporting of Incidents**

Any incident which occurs within the site boundary or is associated with WCPL's operations will be immediately reported by the employee or contractor who has been associated with or witnessed the incident. The method for reporting incidents is outlined in the **PIRMP** and the **EMS**.

In accordance with Condition R2 of EPL 529 and the *PIRMP*, WCPL must notify the EPA of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident. Notifications will be made by telephoning the Environment Line service on **131 555**.

WCPL must also notify DPIE and any other relevant agencies immediately after it becomes aware of an incident, as outlined in Section 5.4 of the *PIRMP*. The notification must be in writing and identify the development (Wambo Coal Mine, DA305-7-2003) and set out the location and nature of the incident.

WCPL will provide written details of the incident to relevant agencies within seven days of the incident.

### **9.2.5 Reporting of Non-Compliances**

Within seven days of becoming aware of a non-compliance with any of the conditions of DA305-7-2003, WCPL must notify DPIE of the non-compliance. The notification must be in writing to the compliance mailbox via the Major Project's website and must:

- identify the development (Wambo Coal Mine (DA305-7-2003)),
- set out the condition of DA305-7-2003 that the development is non-compliant with,
- detail why it does not comply and the reasons for the non-compliance (if known); and
- detail what actions have been, or will be, undertaken to address the non-compliance.

### **9.2.6 Reporting of Results**

A comprehensive summary of the water monitoring results will be made publicly available on the WCPL website:

<https://www.peabodyenergy.com/Operations/Australia-Mining/New-South-Wales-Mining/Wambo-Approvals,-Plans-Reports>

Information on the website will be updated regularly, as required by DA305-7-2003.

### **9.2.7 Website Updates**

WCPL will ensure that any information relevant to water management and monitoring is uploaded to the website (and kept up to date). This includes:

- Current statutory approvals;
- Approved strategies, plans or programs required under the DA305-7-2003;
- A community complaints register;
- Minutes of Community Consultative Committee (CCC) meetings;
- Annual Reviews;
- A copy of any Independent Audits and WCPL's response to any recommendations in any audit; and
- Any other matter required by the Planning Secretary.

WCPL has made provision on its website for comments/ enquiries by members of the community. Email enquiries can be made at [WamboCommunity@peabodyenergy.com](mailto:WamboCommunity@peabodyenergy.com).



## 10.0 Accountabilities

Table 12 outlines the accountabilities associated with this WMP.

Table 12: WMP Accountabilities

Role	Accountabilities for this document
Operations Manager	Provide adequate resources for the implementation of this Plan.
Environment and Community Manager	Implement the WMP (and sub-plans). Ensure that monitoring, periodic environmental inspections and visual assessments after high rainfall events are undertaken. Provide that the Training and Communication, Monitoring and Review and Improvement requirements of this Plan are met. Investigate and report all incidents involving the failure or damage to Water Management Structures.
Environmental Advisor	Assist the E&C Manager as required in the implementation of this Plan. Investigate and report all incidents involving the failure or damage to Water Management Structures.
Task Coordinators	Provide that the requirements of this Plan are met through compliance with WCPL procedures. Report all incidents involving the failure or damage to Water Management Structures.
All contractors	Undertake works in accordance with the objectives and principles of this Plan (where relevant). Report all incidents involving the failure or damage to Water Management Structures.
All personnel	Undertake works in accordance with the objectives and principles of this Plan (where relevant). Report all incidents involving the failure or damage to Water Management Structures.

## 11.0 References

### 11.1 Related Documents

Related documents, listed in **Table 13** below, are internal or United Wambo documents directly related to or referenced from this document.

**Table 13: Related Documents**

Document ID	Title
WA-ENV-MNP-501	Wambo Environmental Management Strategy (WCPL EMS)
WA-ENV-MNP-502	Wambo Pollution Incident Response Management Plan (WCPL PIRMP)
WA-ENV-MNP-509.7	United Wambo Open Cut and Wambo Water Management Strategy
-	United Wambo Open Cut and Wambo Water Asset Management Plan
WA-ENV-MNP-509.8	United Wambo Open Cut and Wambo Water Monitoring Program
WA-ENV-MP-513	Wambo Mining Operations Plan/Rehabilitation Management Plan
WA-ENV-MNP-509.1	Wambo Groundwater Management Plan
WA-ENV-MNP-509.2	Wambo Surface Water Management Plan
WA-ENV-MNP-509.3	Wambo Erosion and Sediment Control Plan
WA-ENV-MNP-509.4	Wambo Surface and Ground Water Response Plan
WA-ENV-MNP-509.5	United Wambo Open Cut and Wambo Site Water Balance (including Salt Balance)
WA-ENV-MNP-509.6	North Wambo Creek Diversion Management Plan
UWOC-1689771511-365	United Wambo Water Management Plan
UWOC-1689771511-370	United Wambo Groundwater Management Plan
UWOC-1689771511-364	United Wambo Surface Water Management Plan
UWOC-1689771511-369	United Wambo Erosion and Sediment Control Plan

### 11.2 Reference Information

Reference information, listed in **Table 14** below, is information that is directly related to the development of this document or referenced from within this document.

**Table 14: Reference Information**

Reference	Title
DA 305-7-2003	<i>Wambo Coal Mine Notice of Modification of DA305-7-2003 (Modification 16)</i>
EPL 529	<i>Environment Protect Licence 529 for Wambo Coal Mine</i>
WCPL 2003	<i>Wambo Development Project Environmental Impact Statement (EIS), July 2003</i>
SSD 7142	<i>United Wambo Open Cut Coal Mine Development Consent SSD 7142</i>
Umwelt 2016a	<i>United Wambo Open Cut Coal Mine Project – Surface Water Assessment</i>
SLR Consulting	<i>SLR (2020a) SBE LW21-24 Groundwater Technical Review. Report for Wambo Coal Pty Ltd. Report No.665.10008.R02</i>
AGE 2016	<i>United Wambo Open Cut Coal Mine Project – Groundwater Impact Assessment</i>
Umwelt 2016b	<i>United Wambo Open Cut Coal Mine Project – Environmental Impact Statement (EIS)</i>

## **APPENDIX A - Evidence of Consultation**



Nicole Dobbins  
Senior Environmental Advisor  
Wambo Coal Mine  
PMB 1  
Singleton NSW 2330

20/11/2020

Dear Ms Dobbins

**Wambo Coal Mine (DA 305-7-2003-i)  
Water Management Plan**

I refer to the Wambo Water Management Plan (WMP), submitted in accordance with condition B66 of the approval for the Wambo Coal Mine (DA 305-7-2003-i). I understand that revisions to the WMP are required prior to Phase 2 of operations between the Wambo Coal Mine and United Wambo Joint Venture, which are scheduled to start on 1 December 2020.

I note that the WMP includes the following sub – plans:

- Site Water Balance;
- Salt Balance;
- Erosion and Sediment Control Plan;
- Surface Water Management Plan (including the North Wambo Creek Diversion Management Plan);
- Groundwater Management Plan; and
- Water Monitoring Plan.

The Department notes that the Site Water Balance, Salt Balance and Water Monitoring Program cover both the Wambo Coal Mine and United Wambo Joint Venture operations.

The Department has carefully reviewed the WMP and is satisfied that it adequately addresses the relevant requirements of the approval. Accordingly, the Planning Secretary has approved the WMP (Revision 2, November 2020) for Phase 2 of the operations. Please continue to operate in accordance with the previously approved WMP until Phase 2 commences.

Please also ensure that the approved plan is placed on the project website at the earliest convenience. If you wish to discuss the matter further, please contact Melanie Hollis on 8217 2043.

Yours sincerely

Matthew Sprott  
Director  
Resource Assessments (Coal & Quarries)

as nominee of the Planning Secretary



Ms Nicole Dobbins  
Senior Environmental Advisor  
Wambo Coal Pty Ltd  
PMB 1  
Singleton, NSW, 2330

02/09/2020

Dear Ms Dobbins

**Wambo Coal Mine (DA 305-7-2003)  
Endorsement of Water Expert**

I refer to your letter dated 13 August 2020, requesting the Planning Secretary's approval of a suitably qualified person to prepare the Water Management Plan, required by condition B66 of the Wambo Coal Mine Development Consent (DA 305-7-2003).

This plan includes several sub-management plans including a Site Water Balance, Surface Water Management Plan, Monitoring Program, Groundwater Management Plan and Erosion and Sediment Control Plan. I also note that it is proposed to combine the Wambo and United Wambo (SSD 7142) Site Water Balance and Monitoring Program under condition A23(d). These joint aspects of the Water Management Plan would be prepared by Chris Bonomini from Umwelt Australia.

I note that previously endorsed experts for Wambo, Ms Claire Stephenson and Dr Noel Merrick from SLR and Mr Rohan Lucas from Alluvium will remain the endorsed experts for groundwater and the North Wambo Creek Diversion.

The Department has reviewed the nomination and information you have provided and is satisfied that all four experts are suitably qualified and experienced. Consequently, I can advise that the Planning Secretary approves the additional appointment of Chris Bonomini to prepare the relevant sections of the Water Management Plan alongside the existing endorsed experts.

If you wish to discuss the matter further, please contact Sarah Clibborn on (02) 82 896 184 or via email at [sarah.clibborn@planning.nsw.gov.au](mailto:sarah.clibborn@planning.nsw.gov.au).

Yours sincerely

Matthew Sprott  
Director  
Resource Assessments (Coal & Quarries)

as nominee of the Planning Secretary



Nicole Dobbins  
Senior Environmental Advisor  
Wambo Coal Pty Ltd  
PMB 1  
Singleton NSW 2330

28/05/2020

Dear Ms Dobbins

**Wambo Coal Mine (DA 305-7-2003)  
Approval of Experts**

I refer to your correspondence of 23 April, requesting the Secretary's approval of suitably qualified persons to prepare the following environmental management plans for the Wambo Coal Mine (DA 305-7-2003):

- Air Quality and Greenhouse Gas Management Plan, required by condition B46; and
- Groundwater Management Plan required by condition B66(v).

The Department has reviewed the nominations and information you have provided and is satisfied that the following experts are suitably qualified and experienced:

- Shane Lakmaker (Jacobs) – Air Quality; and
- Claire Stephenson (SLR Consulting) – Groundwater.

I note that the Department recently approved the following experts to prepare the Wambo Extraction Plan for Longwalls 21 – 22:

- Dr Noel Merrick, (SLR Consulting) – Groundwater;
- Mr Rohan Lucas, (Alluvium) – Surface water;
- Mr Peter Kuskie, (South East Archaeology) – Aboriginal Cultural heritage; and
- Mr Martin Sullivan, (Eco Logical Australia) – Biodiversity.

The Department is satisfied that these experts are also suitably qualified and experienced to assist in the preparation of site environmental management plans in their field of expertise.

If you wish to discuss the matter further, please contact Melanie Hollis on 8217 2043.

Yours sincerely

Matthew Spratt  
Director  
Resource Assessments (Coal & Quarries)  
as nominee of the Secretary





Mr Peter Jaeger  
Environment and Community Manager  
Wambo Coal Pty Limited  
PMB 1  
Singleton NSW 2330

28/02/2020

Dear Mr Jaeger

**Wambo Coal Project (DA 305-7-2003)  
Endorsement of Experts**

I refer to your letter dated 11 February 2020, requesting the Secretary's approval of suitably qualified persons to prepare the Extraction Plan for Longwalls 21 to 24 for the Wambo Coal Project (DA 305-7-2003).

The Department has reviewed the nominations and information you have provided and is satisfied that these experts are suitably qualified and experienced. Consequently, I can advise that the Secretary approves the appointment of the following experts to prepare the Extraction Plan for Longwalls 21 to 24:

- Mr Joshua Hunt (Resource Strategies) - Extraction Plan preparation;
- Mr James Barbato (Mine Subsidence Engineering Consultants) - Subsidence;
- Mr Rohan Lucas (Alluvium) - Surface Water;
- Dr Noel Merrick (SLR Consulting) - Groundwater;
- Mr Martin Sullivan (Eco Logical Australia) – Biodiversity; and
- Mr Peter Kuskie (South East Archaeology) - Aboriginal cultural heritage.

In relation the upcoming revisions of complex-wide management plans, to align with the commencement of United Wambo Phase 2, it is recommended that the Department's Water Group is consulted on this approach.

If you wish to discuss the matter further, please contact Melanie Hollis on 8217 2043.

Yours sincerely

Matthew Sprott  
A/Director  
Resource Assessments (Coal & Quarries)

as nominee of the Planning Secretary

## Evidence of Consultation on the WMP and Sub Plans

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<b>4 June 2015 - DPIE – Email from Jessie Evans re Wambo 10A Extraction Plan (NOW Comments)</b>		
<p>The Department has received comments from NOW in regards to the Wambo LW 8-10A Extraction Plan. I have attached these for your careful consideration and response. NOW has raised a number of issues, and in particular has concerns regarding the Groundwater Management Plan.</p> <p>Could you please provide a response to NOWs concerns at your earliest possible convenience.</p>	<p>WCPL provided a response to recommendations made by NOW via email on 17 June 2015 – see below.</p>	<p>See below</p>
<b>3 June 2015 - DPIE Water (formerly NSW Office of Water (NOW)) - Extraction Plan for NWU LWs 8-10a (Groundwater Management)</b>		
<p>It is recommended with respect to the exceedance of groundwater level triggers:</p> <ul style="list-style-type: none"> <li>WCPL must investigate the drivers for declining water levels (rather than omitting bores from the monitoring program when bores go dry). Notification to the Office of Water is required as part of the response procedure within 3 months of such an event.</li> </ul>	<p>Five bores are proposed to be removed from the groundwater monitoring program (GW14, GW18, GW19, P5 and P6).</p> <p>Only two samples (August 2011 and December 2011) have been obtained from GW14 since its installation in 2011 (these samples may have been associated with groundwater levels stabilising following drilling). This bore is located to the east of Wollombi Brook and is far removed from mining activities associated with the Wambo Coal Mine.</p> <p>Only one sample (August 2010) has been obtained from GW18. GW19 has been consistently dry since installation and no valid samples have been obtained from this bore.</p> <p>GW18 and GW19 are located immediately downstream and upstream of the North Wambo Creek Diversion, respectively. The alluvial flow in North Wambo Creek has been altered by the historical and existing mining operations including the removal of alluvium across the full width of the channel with consequent desaturation of the adjacent upstream and downstream alluvium associated with the approved and constructed North Wambo Creek Diversion.</p> <p>Bores P5 and P6 have been covered by the approved Wambo Coal Mine waste rock emplacement.</p> <p>WCPL considers removal of these five bores from the groundwater monitoring program is justified as outlined above.</p> <p>Trigger levels are not proposed for a further four bores along North Wambo Creek (GW08, GW09, GW16 and GW17).</p> <p>WCPL has initiated an investigation for bores GW08 and GW09 as outlined further below. Trigger levels will not be developed for these bores until this investigation is complete.</p>	<p><b>GWMP (Section 6.0) and WMPprog)</b></p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
	GW16 and GW17 are located upstream of the North Wambo Creek Diversion and in close proximity to the approved open cut. There are no groundwater users located in the vicinity of North Wambo Creek upstream of the North Wambo Creek Diversion. Therefore, a trigger level for these two bores is not considered warranted.	
<ul style="list-style-type: none"> <li>Where the driver for declining shallow bore water levels exceeding trigger levels cannot be linked to the prevailing climatic influence or miscellaneous sampling error, additional groundwater modelling is required to re-assess if there is a change in the predicted take of water from the Lower Wollombi Brook Water Source from mining related activities. As part of WCPL's response procedure, a report summarising the assessment is to be submitted to the Office of Water.</li> </ul>	<p>WCPL has initiated an investigation into the monitored declining water levels in GW08 and GW09.</p> <p>As described in Section 6.1.3 of the revised GWMP, a preliminary investigation report will be provided to the OP&amp;E and NOW by 30 September 2015.</p> <p>This report will include preliminary conclusions regarding the potential licensing implications and a process and timetable for any further investigation work (including potential additional numerical hydrogeological modelling work).</p>	<b>GWMP</b> (Section 5.4)
<ul style="list-style-type: none"> <li>Where the updated modelled aquifer interference take of water from the Lower Wollombi Brook Water Source (encapsulating Wambo and North Wambo Creek) exceeds the estimates as predicted in WPCL's Groundwater Impact Assessment by 100% or more, WCPL must re-evaluate the associated ecological impacts and any influence on a low now cease to pump criteria specified in the relevant WSP. The reference value triggering this response procedure must be clearly documented in the GWMP.</li> </ul>	<p>As described in Section 6.1.3 of the revised GWMP, where the investigation for GW08 and GW09 indicates a revised predicted take from alluvial water sources that exceeds the previous estimates by more than 100%, WCPL would consider other potential associated impacts (e.g. on ecology) and any influence on a low now cease to pump criteria specified in the HUA WSP.</p>	<b>GWMP</b> (Section 5.4)
<ul style="list-style-type: none"> <li>The trigger levels in Table 11 of the GWMP outlines a minimum and maximum depth to water level. These values, plus any new bores added to the list, and the bores proposed to be dropped, must be presented in Australian Height Datum.</li> </ul>	<p>Table 11 of the GWMP has been revised to include trigger levels presented in Australian Height Datum.</p>	<b>GWMP</b> (Table 11)
<p>It is recommended with respect to the exceedance of groundwater quality triggers:</p> <ul style="list-style-type: none"> <li>Appropriate water quality baseline data has not been captured and presented in way that can be used for before and after impact. Salinity data for a number of bores has fluctuated considerably which is not consistent with a more stable groundwater environment. The use of major ion analysis and ONQC procedures should be reviewed to inform if the salinity measurements reported are accurate and if so the drivers to cause such variability in the results.</li> </ul>	<p>The GWMP has been revised to include annual comprehensive analysis of major ions standpipe bores.</p> <p>A description of data management procedures has been included in Section 5.3.2.</p>	<p><b>GWMP</b> (Section 6.1 - Monitoring) (see also <b>WMPprog</b>)</p> <p><b>GWMP</b> (Section 6.3 – Data Management Procedures)</p>
<ul style="list-style-type: none"> <li>Due to the concerns with the potential for cross aquifer interconnection, water quality performance measures are essential to the impact assessment. Water quality performance measures should be defined and added to the GWMP.</li> </ul>	<p>The GWMP has been revised to include groundwater quality trigger levels in Section 5.4.</p>	<p><b>GWMP</b> (Section 4.2 - Triggers)</p> <p><b>GWMP</b> (Section 4.3 – Performance Criteria)</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>It is recommended with respect to the exceedance of predicted mine inflows:</p> <ul style="list-style-type: none"> <li>There is a discrepancy between the GWMP which outlines a monthly measurement and annual assessment of mine inflows, whilst the 'Subsidence Response Strategy' indicates metering of weekly dewatered volumes. It should be consistently reported weekly, in the GWMP as this will improve the understanding of inflow and assist with groundwater management and the triggers for exceedance.</li> </ul>	<p>Section 5.2.5 of the GWMP has been updated to clarify that dewatering values are recorded internally on a daily basis (during active pumping).</p> <p>As outlined in the North Wambo Creek Subsidence Response Strategy, these values are reviewed weekly for any indication that pumping rates are higher than normal (which would trigger an investigation).</p> <p>Dewatering values are also reviewed annually (as outlined in the GWMP) to determine the inflows from groundwater sources and to verify whether WCPL holds sufficient groundwater licence entitlements.</p>	<p><b>GWMP</b> (Section 6.1.2 – Monitoring of Inflows)</p> <p><b>GWMP</b> (Section 5.2 – Annual Site Water Balance)</p> <p><b>GWMP</b> (Section 7.3.3 – Response Plan)</p>
<ul style="list-style-type: none"> <li>Where the annual assessment for mine inflows exceeds the peak estimate as predicted in WCPL's Groundwater Impact Assessment by 50% or more, WCPL shall: <ul style="list-style-type: none"> <li>investigate if there is a change in the predicted take of water from the Lower Wollombi Brook Water Source from mining related activities.</li> <li>where there is an increased take from the Lower Wollombi Brook Water Source, investigate any influence on a low flow cease to pump criteria specified in the relevant WSP.</li> <li>define the mine inflow volume value triggering this response procedure within the GWMP.</li> <li>As part of WCPL's response procedure, a report summarising the assessment is to be submitted to the Office of Water.</li> </ul> </li> </ul>	<p>Section 5.2.5 of the GWMP has been updated to include the recommended response procedure.</p> <p>The mine inflow volume that would trigger the response procedure has been defined in the GWMP i.e. 563 ML/annum, which is 50 % more than the peak estimate predicted by HydroSimulations (2014) [375 ML/annum) for the North Wambo Underground Mine).</p>	<p><b>GWMP</b> (Section 6.1.2 – Inflows to Underground Workings) Note: inflow volume has been updated for SBU)</p> <p><b>GWMP</b> (Section 7.3.3 – Response Plan)</p>
<ul style="list-style-type: none"> <li>WCPL must notify the Office of Water as soon as practicable on become aware of any take of water in excess of its licensed entitlement</li> </ul>	<p>Section 5.2.5 of the GWMP has been updated to include this statement.</p>	<p><b>GWMP</b> (Section 6.1.2)</p>
<p>It is recommended with respect to monitoring leakage from dams:</p> <ul style="list-style-type: none"> <li>The closest bore to South Dam is Piezometer 114 representative of Wambo Creek alluvium. South Dam contains produced water from the mine and P114 shows a sharp rise in salinity to a level on par with water in the dam. This indicates probable leakage occurring from the dam that warrants further investigation. However, as the proponent proposes not to utilise water quality as a performance measures, no direct response is proposed. Significant leakage to the nearby alluvial aquifer could risk a change in the beneficial use of the aquifer. Trigger levels with regard to salinity must be set to investigate and determine if remediation is required.</li> </ul>	<p>WCPL has initiated an investigation into the monitored increasing salinity levels in P114.</p> <p>Wambo South Water Dam is currently not in use for the period of secondary extraction for Longwall 9, Longwall 10 and Longwall 10A at the North Wambo Underground Mine. Wambo South Water Dam has been drained as far as practical since January 2015. Therefore, any possible leakage mechanism that may have impacted bore P114 may no longer be present.</p>	<p><b>GWMP</b> (Table 12 – triggers) and <b>GWMP</b> (Section 6.1.3 – Monitoring) Note two additional bores have now been established in the vicinity of P114 (P316 and P319) (see also <b>WMPprog</b>)</p> <p><b>GWMP</b> (Section 6.4.2 - Investigation)</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<ul style="list-style-type: none"> <li>A report summarising any special assessment for the above recommendations should be provided within 6 months</li> </ul>	As described in Section 6.1.4 of the revised GWMP, a preliminary investigation report will be provided to the DP&E and NOW by 30 November 2015.	<b>GWMP</b> (section 6.4.2) – Report provided to DPIE and NRAR/DPIE Water on 22 Nov 2018 <sup>1</sup>
<b>3 June 2015 - DPIE Water (formerly NSW Office of Water (NOW)) - Extraction Plan for NWU LWs 8-10a (Surface Water Management)</b>		
<p>The Office of Water recommends the proponent and the Department of Planning and Environment develop a consultation process with affected landholders to address existing and potential degradation which occurs as a result of mining subsidence. This should focus on incorporating natural processes for channel recovery particularly using large timber controls to maintain bed level (bed sills), bank toe protection (timber bank revetment) and creation of scour pools by using 'forced' controls such as engineered log jams as an adjunct to revegetation of both banks of both watercourses.</p>	<p>All land above the North Wambo Underground Mine is owned by WCPL. Therefore there are no other affected landholders associated with the North Wambo Underground Mine Extraction Plan for Longwalls 8 to 10A.</p> <p>Advisian (2015) concluded it is unlikely Wambo Creek and Stony Creek would experience adverse impacts from the North Wambo Underground Mine, and mitigation measures are unlikely to be required. In the unlikely event that any mitigation measures are required, these would be developed in consultation with the Department of Planning and Environment and the NSW Office of Water, and would aim to incorporate natural processes for channel recovery.</p>	N/A
<b>21 October 2015 – DPIE – Email from Scott Brooks re WMP (and Sub Plans)</b>		
<p>We (DPIE) will need some type of water balance and the info for the evaporation sprays if you want to use them.</p> <p>See also below comments.</p>		<b>SWB</b> (Water balance)
<p><b>SGWRP (version 8)</b></p> <ul style="list-style-type: none"> <li>2.7 North Wambo Creek Diversion Performance Criteria - Given the problems with the NWCD this section should refer to other management plans or have a section referring to erosion and the potential for sediment generation and loss from the system.</li> </ul>		<b>SGWRP</b> obsolete <b>NWCD MP</b> (Appendix D to <b>SWMP</b> ) includes NWCD performance criteria
<p><b>SWMP (version 8)</b></p> <ul style="list-style-type: none"> <li>1.4.1 Environmental Planning &amp; Assessment Act 1979 (Table 3) - (NOW) Currently called DPI Water</li> </ul>		<b>WMP</b> and Sub Plans now reference DPIE Water
<ul style="list-style-type: none"> <li>2.2.3.2 Stream Flow (Table 7) - (No flow data available) Is this because the SWC never runs?</li> </ul>		<b>SWMP</b> (Table 10) – no flow events recorded for South Wambo Creek for period of record
<ul style="list-style-type: none"> <li>4.1 Monitoring Network, Parameters and Frequency - (Mine water monitoring is undertaken for operational management purposes only. This data is not reported publicly). This would appear to</li> </ul>		<b>SWMP</b> (Section 6.1.2). This data not reported publicly.

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>conflict with Schedule 6 Condition 12 requiring the publishing of monitoring results.</p>		
<ul style="list-style-type: none"> <li>4.1.5 Riparian Vegetation and Creek Bed Stability - The NWCD has its own rehab management plan. This management plan should refer to it and it may need to be updated.</li> </ul>		<p><b>SWMP</b> (Section 6.1.6 - Monitoring) – see also <b>BMP</b> and <b>NWCD MP</b> (Appendix D of <b>SWMP</b>)</p>
<ul style="list-style-type: none"> <li>4.1.6 Monitoring of Discharge Flows in the North Wambo Creek Diversion - What did NOW ask for. This should be included.</li> </ul>		<p><b>SWMP</b> (Section 6.1.7 - Monitoring) – see also <b>NWCD MP</b> (Appendix D of <b>SWMP</b>)</p>
<ul style="list-style-type: none"> <li>6.1 Review - (Review every two years) Usually 3 years</li> </ul>		<p><b>WMP</b> Section 11.1.3 and <b>SWMP</b> (Section 9.1.2)</p>
<p><b>GWMP (Version 9)</b></p> <ul style="list-style-type: none"> <li>2.2.3.1 Alluvial Water Sources - (Investigation into increase in EC) This will need to be reported in the AEMR</li> </ul>		<p><b>WMP</b> Section 9.2.1 (Annual Review)</p>
<ul style="list-style-type: none"> <li>3.1.3 Permian Monitoring Locations- Need to discuss why we monitor if the results cannot result in action.</li> </ul>		<p><b>GWMP</b> (Section 4.1.2)</p>
<ul style="list-style-type: none"> <li>3.2 Trigger Values for Groundwater Quality - (Bi-monthly monitoring) This will need to be defined. Twice a month or every 2 months</li> </ul>		<p><b>GWMP</b> (Section 4.2)</p>
<ul style="list-style-type: none"> <li>4.1.6 Chitter Dam and Wambo South Water Dam Monitoring Program -Need some comment here if the dam will be recommissioned if it is found to be leaking.</li> </ul>		<p><b>GWMP</b> (section 6.1.3)</p>
<ul style="list-style-type: none"> <li>6.1 Review - (Review every two years) Review is normally every 3 years.</li> </ul>		<p><b>WMP</b> Section 11.1.3 and <b>GWMP</b> (Section 9.1.3)</p>
<p><b>ESCP</b></p> <ul style="list-style-type: none"> <li>No comment on ESCP</li> </ul>		
<p><b>6 November 2015 - DPIE Water Comments on GWMP</b></p>		
<p>DPI Water recommended that the groundwater monitoring program be revised to address the loss of bores from the North Wambo Creek alluvium.</p>	<p>WCPL is installing additional groundwater monitoring locations in 2017.</p>	<p><b>GWMP</b> (Section 6) See also <b>WMP</b> <b>Prog</b></p>
<p>DPI Water noted that groundwater trigger levels in the GWMP are not referenced in Australian Height Datum (AHD).</p>	<p>Section 3.1.1 of the GWMP has been amended to include absolute trigger levels in m AHD.</p>	<p><b>GWMP</b> (Table 11)</p>



Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
DPI Water requested that P114 and P116 of the Wambo Creek alluvial trigger bores within the subsided area be nested or paired with deeper interburden bores to assess the direction of flow between Permian and alluvial aquifers during the post mining period.	WCPL is installing additional piezometers in this area in 2017.	<b>GWMP</b> (Section 6) See also <b>WMPprog</b>
DPI Water noted that Table 3 of the GWMP should be updated to reflect that: <ul style="list-style-type: none"> <li>• the combined extraction limit of 20BL166910, 20BL173032, 20BL173033, 20BL173034 and 20BL173035 is 450 ML;</li> <li>• the combined extraction limit of 20BL173040, 20BL168017 and 20BL172061 is 750 ML; and</li> <li>• 20BL166906 has been cancelled.</li> </ul>	The GWMP has been updated with the latest groundwater licence information.	<b>GWMP</b> (Table 4 – Groundwater Licences)
DPI requested that Table 3 of the GWMP is updated to include all Water Access Licences (including regulated river access licences). DPI Water recommends that WCPL provide clarification regarding which licences relate to the operation of Wambo mine and which are used to account for passive water take.	Table 3 of the GWMP lists groundwater entitlements. Section 1.4.2 of the GWMP has been revised to include a reference to the SWMP for a list of surface water entitlements.	<b>GWMP</b> (Table 4 – Groundwater Licences) and <b>SWMP</b> (Table 5 – Surface Water Licences)
DPI Water indicated that the GWMP should address its previous comment that where the updated modelled aquifer interference take of water from the Lower Wollombi Brook Water Source exceeds the estimates as predicted in WPCL's Groundwater Impact Assessment by 100% or more, WCPL must re-evaluate the associated ecological impacts and any influence on a low flow cease to pump criteria specified in the relevant WSP. The reference value triggering this response procedure must be clearly documented in the GWMP.	This comment has been addressed in the SGWRP.	<b>GWMP</b> (Section 6.1.2 – Inflows to Underground Workings) Note: inflow volume has been updated for SBU) and <b>GWMP</b> (Section 7.3.3 – Response Plan)
DPI Water referred to the Assessment of Groundwater Trends in GW08 and GW09 prepared by HydroSimulations (29 September 2015) and commented that vertical connection with North Wambo Creek and Wambo Creek is more significant than modelled. DPI Water recommended that an appropriate timeframe be set where the groundwater conceptualisation and numerical model will be updated.	The groundwater conceptualisation was reviewed as a result of monitoring results in GW08 and GW09. The numerical model was recalibrated to capture the monitoring data in GW08 and GW09 and reported in HydroSimulations (2016a).	<b>GWMP</b> (Section 6.4.1)
<b>6 November 2015 - DPIE Water Comments on SWMP</b>		

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
DPI Water notes that WCPL states that it currently holds two water access licences (WAL No. 23897 and 718) within the Wollombi Brook water source, however WAL 718 is within the Hunter Regulated River water source.	Section 1.4.4 has been revised to outline the surface water entitlements held by WCPL, including WAL 23897, WAL 718 and regulated river licences. Groundwater entitlements are described in the GWMP.	<b>SWMP</b> (Section 2.6) and <b>GWMP</b> (Section 2.4)
DPI Water requested further detail on the comments in Table 7 of the SWMP regarding “NA” and “No flow data available”.	WCPL has included the following notes to Table 8 (previously Table 7) of the SWMP: <ul style="list-style-type: none"> <li>• NA – Parameter not available in data summary records.</li> <li>• No flow data available – Flow data not available due to damage to station or unreliable sensor responses.</li> <li>• WCPL has recently updated its data management procedures for the flow gauging stations to improve data capture and recording.</li> </ul>	<b>SWMP</b> (Table 10)
DPI Water recommends that SWMP performance indicators should include exceedance of the stream flow impact assessment criteria in addition to the “number of exceedances of surface water impact assessment criteria”.	Footnote 1 to Table 12 has been revised as follows to clarify that the performance indicators refer to both the surface water quality and surface water flow impact assessment criteria: <i>An exceedance occurs when water quality results exceed the 80th Percentile Trigger Value after three consecutive sampling events or the surface flow impact assessment criteria are met (refer to SGWRP for TARP)</i>	<b>SWMP</b> (Table 19 – TARP for Impacts on Surface Water Flows) and <b>SWMP</b> (Table 20 – TARP for Impacts on Surface Water Quality)
DPI Water recommends that after detection of an exceedance during one surface water quality sampling event, the frequency of monitoring is increased to weekly and that contingency actions be implemented following two further exceedances. DPI Water notes that sampling could return to monthly once sampling indicates that parameters are within trigger levels.	The impact assessment criteria for surface water quality have been set based on the 20th and 80th percentile of the available dataset for each site. The surface water quality impact assessment criteria seek to identify persistent statistical variation from baseline data, and therefore there are triggers for two and three consecutive exceedances of the criteria. Initiating additional monitoring in response to one exceedance would add significant additional monitoring burden for reasonably regular events that could be associated with natural water quality variations. The majority of watercourses at Wambo are ephemeral, which also makes this recommendation impractical. Increasing monitoring frequency following two consecutive exceedances has been addressed in the SGWRP.	<b>SWMP</b> (Section 4.1 - Triggers) <b>SWMP</b> (Table 20 – TARP for Impacts on Surface Water Quality)
DPI Water notes that the nearest flow monitoring site downstream of Longwalls 11 to 13 on North Wambo Creek appears to be at the confluence to Wollombi Brook. DPI Water recommends that WCPL investigate options to install a flow monitoring site immediately downstream of the predicted area of subsidence in order to monitor accurately the surface water losses as a result of Longwalls 11 to 13 (and separate these losses from other sources).	WCPL has a monitoring site immediately downstream of Longwalls 11 to 13 (site FM3). The SWMP includes site FM3 in the monitoring program.	<b>SWMP</b> (Section 6.0) and <b>WMP</b> Prog
<b>6 November 2015 - DPIE Water Comments on SGWRP</b>		

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>In relation to Table 3 of the SGWRP, DPI Water requested further detail on the triggers and responses for impacts on private bores, in particular:</p> <ul style="list-style-type: none"> <li>• DPI Water expressed concerns about the trigger for a Level 2 Contingency Response, in particular if private bores are unable to sustain extraction for licensed and basic rights purposes with a 2 m drawdown.</li> <li>• DPI Water expressed concerns about the trigger for a Level 2 Contingency Response, in particular that action (i.e. a Level 2 Contingency Response) may only be initiated when three consecutive monitoring rounds show a decline at the trigger level.</li> <li>• DPI Water recommended that relevant agencies be notified of trigger exceedances as part of regular reporting requirements.</li> <li>• DPI Water expressed concerns about the timing for provision of compensatory water supplies to affected landholders.</li> </ul>	<p>WCPL recognises that bores in some circumstance (e.g. in shallow aquifers) may not be able to maintain a sustainable yield for a drawdown less than 2 m. WCPL also recognises that three months of drawdown greater than 2 m would be significant in some circumstances.</p> <p>The Trigger Action Response Plan (TARP) for private bores has been structured so that receipt of a new complaint from a landholder in relation to decreasing levels in a private bore automatically initiates a Level 2 Contingency Response. WCPL considers that this mitigates the risks identified by DPI Water.</p> <p>In response to DPI Water's comment regarding notification of relevant agencies, Table 3 of the SGWRP has been revised to include the following Action for a Level 2 Response Contingency Phase:</p> <ul style="list-style-type: none"> <li>•<i>Notify DP&amp;E and DPI water of contingency response.</i></li> </ul> <p>The Plan phase for a Level 2 Response Contingency Phase in Table 3 of the SGWRP has been revised to address DPI Water's comments as follows:</p> <ul style="list-style-type: none"> <li>•<i>If preliminary or subsequent investigations <del>determine</del> indicate that compensatory water supplies are to be initiated, as a direct result from Wambo's operations, then Wambo will commence consultation with the affected Landowners to establish an agreed suitable compensatory supply of water, until further monitoring can <del>determine signs of increasing water levels</del> establish these are no longer required.</i></li> <li>•<i>Review and update the WMP and resubmit to DP&amp;E.</i></li> </ul>	<p><b>GWMP</b> (Table 16 – TARP for Impacts on Private Bores)</p>
<p>In relation to Table 4 of the SGWRP, DPI Water expressed concern that the TARP for impacts on surface water flows does not include mitigation measures only further monitoring.</p>	<p>The Action phase of the TARP for impacts on surface water flows outlines the process for undertaking a preliminary investigation, including engaging a suitably qualified hydrologist.</p> <p>The Plan phase of the TARP includes developing appropriate mitigation measures in consultation with relevant government agencies (including DPI Water) where it is shown that a flow loss has occurred that is greater than modelled.</p> <p>The Plan phase of the TARP for a Level 2 Response Contingency Phase in Table 4 of the SGWRP has been revised to clarify that mitigation measures may include stream remediation works:</p> <ul style="list-style-type: none"> <li>•<i>If confirmation of a flow loss which is greater than modelled has occurred Wambo will notify the relevant government agencies and in consultation develop appropriate measures to mitigate the loss of surface water flows in the surface water streams (e.g. stream remediation techniques).</i></li> </ul>	<p><b>SWMP</b> (Table 19 – TARP for Impacts on Surface Water Flows)</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
	WCPL considers that detail on mitigation measures for unforeseen impacts should not be foreshadowed in detail but developed at the time in consultation with relevant government agencies.	
<p>In relation to Table 5 of the SGWRP, DPI Water recommended that after detection of an exceedance during one surface water quality sampling event, the frequency of monitoring is increased to weekly and that contingency actions be implemented following two further exceedances. DPI Water notes that sampling could return to monthly once sampling indicates that parameters are within trigger levels.</p>	<p>The impact assessment criteria for surface water quality have been set based on the 20th and 80th percentile of the available dataset for each site. The surface water quality impact assessment criteria seek to identify persistent statistical variation from baseline data, and therefore there are triggers for two and three consecutive exceedances of the criteria.</p> <p>Initiating additional monitoring in response to one exceedance would add significant additional monitoring burden for reasonably regular events that could be associated with natural water quality variations.</p> <p>In response to the comment from DPI Water, WCPL has amended the Action phase for a Level 1 Response Management Measures (i.e. two consecutive exceedances of the surface water impact assessment criteria) in Table 5 of the SGWRP as follows:</p> <ul style="list-style-type: none"> <li>• <del>Increase</del> <del>Maintain</del> monitoring of surface water site(s) to fortnightly to identify if water quality results are trending back to long term averages as identified in the SWMP.</li> <li>• If any water quality exceeds the 80th Percentile Trigger Value (three consecutive samples), then go to Level 2 Response.</li> </ul>	<p><b>SWMP</b> (Table 20 – TARP for Impacts on Surface Water Quality)</p>
<p>In relation to Section 2.5 of the SGWRP, DPI Water noted that all loss of surface flow needs to be accounted for through appropriate licences during operation of the mine and prior to the take of water.</p>	<p>WCPL recognises that use of licensing as an offset measure would be in addition to the licence required for other operational purposes.</p> <p>Section 2.5 of the SGWRP has been clarified as follows:</p> <p><i>Appropriate management measures will be developed and implemented in consultation with relevant government agencies and may include the relinquishment of an equivalent portion of water access licences as a direct offset for potential groundwater inflows into the Mine (HydroSimulations, 2014) (i.e. in addition to licences already held to account for water take).</i></p>	<p><b>SWMP</b> (Section 7.3.3)</p>
<p><b>27 November 2015 – DPIE – Approval of WMP (and Sub Plans)</b></p>		
<p>The Department is satisfied that the plans generally address the relevant conditions of the project approval (DA305-7-2003) and the Secretary approves the plans. The plans come into force on 30 November 2015.</p>	<p>See above consideration WCPL provided a response to recommendations made by DPIE Water on 6 November 2015 - see above.</p>	<p>See above</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>The Department notes that DPIE Water are expected to comment on the Extraction Plan for SBU LWs 11-13 and that should these comments require significant changes to any component of the WMP then these changes be made and the plans resubmitted for review and approval.</p>		
<p><b>17 January 2016 – DPI Water – Response to updated Extraction Plan and Water Management Plan – SBU Extraction Plan LWs 11-13</b></p>		
<p>Reference is made to the revised Extraction Plan and Water Management Plans for the Wambo South Bates (Whybrow Seam) Underground Mine Extraction Plan Longwalls 11-13 dated December 2015 and the response to DPI Water comments. DPI Water provides the following further comments</p>		
<p><b>Water Licensing</b>  Wambo Coal Pty Ltd (WCPL) notes in its response that it is in the process of conducting a licensing review to confirm that it holds appropriate licences prior to the commencement of South Bates Underground Mine. DPI Water requests that WCPL liaise with DPI Water to ensure that sufficient entitlement is held and licences are nominated to account for the predicted take of water prior to commencement. As previously requested, WCPL must provide an updated table that includes the maximum predicted take of water from surface water, alluvial groundwater and Permian groundwater pre and post remediation and the specific licences nominated to account for this take. This should be incorporated into the Water Management Plan.</p>		<p><b>GWMP</b> (Table 4 – Groundwater Licences) and <b>SWMP</b> (Table 5 – Surface Water Licences)</p>
<p><b>Groundwater</b>  DPI Water made a number of comments regarding revision of the monitoring program, including concerns regarding the loss of bores and triggers in the North Wambo Creek alluvium. WCPL responded that the following statement had been included in the groundwater management plan: “Specific trigger levels for GW08 and GW09 have not been established however if GW08 and GW09 do not recover within 12 months of the cessation of dewatering pumping, WCPL may consider installing replacement bores that allow monitoring of the alluvium and underlying interburden material...”. It is recommended that this issue be discussed in a meeting between DPI Water and the proponent to ensure that DPI Water concerns regarding monitoring are resolved. DPI Water recommended that an appropriate timeframe be set where the groundwater conceptualisation and numerical models are updated to acknowledge the increased hydraulic connection and provide a more</p>		<p>N/A</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>accurate estimate of the take of water. WCPL responded that whilst the vertical hydraulic conductivity above the previous bord and pillar workings in the Wambo Seam is higher than previously adopted, there is no evidence to support any lateral extension of higher connectivity away from the workings. DPI Water recommends that this issue be further discussed and resolved in the meeting proposed above with the proponent. DPI Water still has some concerns regarding groundwater monitoring and management, as outlined above. It is recommended these concerns be resolved at a subsequent meeting; however, it is not considered that the issues should delay the commencement of work.</p>		
<p><b>25 May 2017 and 5 July 2017 – DPIE Comments on WMP (and Sub Plans)</b></p>		
<p><b>GWMP</b></p>		
<ul style="list-style-type: none"> <li>Update the GWMP to reflect the modified layout for LWs 14-16 and the most up-to-date and recommended monitoring regime provided in Technical Report 2.</li> </ul>	<p>The GWMP has been revised to reflect the latest layout for LWs 14-16 (e.g. see Figure 3). There was no additional monitoring recommended by Technical Report 2 of the Extraction Plan for the South Bates Underground mine. It is noted that this report describes some sites that have been removed from the program due to disturbance by open cut operations (e.g. P5 and P6).</p>	<p><b>GWMP</b> (Figure 3) and <b>GWMP</b> (Section 6.0 – Monitoring). See also <b>WMPProg</b>.</p>
<ul style="list-style-type: none"> <li>Replace Figure 3 with the approved longwall layout for LWs 11-16 (as approved by the Extraction Plan on 16 May 2017).</li> </ul>	<p>Figure 3 has been revised.</p>	<p><b>GWMP</b> (Figure 3)</p>
<ul style="list-style-type: none"> <li>Provide evidenced of consultation with DRG and DPI-Water in relation to this version of the GWMP, and indicate how many matters raised have been addressed.</li> </ul>	<p>Section 1.5 and this Appendix have been revised to include further detail on consultation.</p>	<p>This table</p>
<ul style="list-style-type: none"> <li>Replace Figure 5 with the location of the approved longwall layout for LWs 11-16.</li> </ul>	<p>Figure 5 has been revised to show the location of mapped alluvium in the lower reaches of the creeks over the latest approved underground mine layout.</p>	<p><b>GWMP</b> (Figure 3)</p>
<ul style="list-style-type: none"> <li>Update Section 2.2.1 to include a discussion of the latest approved mining operations in the South Bates Underground Mine.</li> </ul>	<p>Section 2.2.1 has been revised to discuss the latest status of mining at Wambo.</p>	<p><b>WMP</b> Section 1.1.1 (Mining History)</p>
<ul style="list-style-type: none"> <li>Update Section 2.2.2 to describe the current groundwater monitoring network. Replace Figure 7 with Figure 4 in Technical Report 2.</li> </ul>	<p>Section 2.2.2 has been revised with the latest groundwater monitoring network.</p>	<p><b>GWMP</b> (Section 6.0 – Monitoring). See also <b>WMPProg</b>.</p>
<ul style="list-style-type: none"> <li>Update the data summaries in Section 2.2.3 (including Table 8) to include the last 3 years of data.</li> </ul>	<p>The data in Table 8 (HARTT Analysis Results for Shallow Monitoring Bores) was used to generate the groundwater impact assessment criteria.</p> <p>It is not considered appropriate to continue to update baseline data during mining operations, as it may skew the impact assessment criteria. Monitoring results during operations are presented in Annual Reviews.</p>	<p><b>GWMP</b> (Table 8 – HARTT Analysis)</p>
<ul style="list-style-type: none"> <li>Update the discussion on the hydrogeological model in Section 2.2.5.</li> </ul>	<p>Section 2.2.5 has been revised to refer to the latest hydrogeological model for the approved mine.</p>	<p><b>GWMP</b> (section 3.6)</p>



Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<ul style="list-style-type: none"> <li>Update the ground water triggers in Section 3.0 to reflect the latest data for the South Bates Underground.</li> </ul>	<p>The trigger levels in Section 3.0 are for bores with a broad spatial extent and are designed for all open cut and underground mining operations at Wambo. It is not considered appropriate to revise trigger levels to incorporate mine affected data.</p>	<p><b>GWMP</b> (Section 4.0 – triggers). See also <b>WMPprog</b></p>
<ul style="list-style-type: none"> <li>Update Section 4.1.5 to reflect inflow estimates and triggers for South Bates Underground Mine inflows (based on 2015 HydroSimulations estimates).</li> <li>Liaise with DPI-Water in relation to the inflow “trigger”, procedures for exceedances and licence implications.</li> </ul>	<p>Section 4.1.5 has been revised for the South Bates Underground Mine based on the same methodology that was used for North Wambo Underground Mine. This methodology was developed in consultation with DPI Water.</p>	<p><b>GWMP</b> (Section 6.1.2)</p>
<ul style="list-style-type: none"> <li>Update Section 4.0 and Table 12 to reflect the most up-to-date and current groundwater monitoring regime.</li> </ul>	<p>Table 12 reflects the latest groundwater monitoring network. Note that Table 6 includes a note that GW14 has been dry since December 2011, GW18 has been dry since October 2010 and GW19 has been dry since monitoring began in 2009.</p>	<p><b>GWMP</b> (Section 6.0) and <b>WMPprog</b>.</p>
<ul style="list-style-type: none"> <li>Update Section 4.1.6 to reflect the current status of mining and monitoring results in the vicinity of these structures.</li> </ul>	<p>Section 4.1.6 has been revised to reflect that the Chitter Dam has been decommissioned.</p>	<p><b>GWMP</b> (Section 6.1.3)</p>
<ul style="list-style-type: none"> <li>Update the GWMP to reflect the modified layout for LWs 14-16 and the most up-to-date and recommended monitoring regime provided in Technical Report 2.</li> </ul>	<p>The GWMP has been revised to reflect the latest layout for LWs 14-16 (e.g. see Figure 3). There was no additional monitoring recommended by Technical Report 2 of the Extraction Plan for the South Bates Underground mine. It is noted that this report describes some sites that have been removed from the program due to disturbance by open cut operations (e.g. P5 and P6).</p>	<p><b>GWMP</b> (Figure 3)</p>
<p><b>25 May 2017 and 5 July 2017 – DPIE Comments on WMP (and Sub Plans)</b></p>		
<p><b>SWMP</b></p> <ul style="list-style-type: none"> <li>Update the SWMP to reflect the modified layout for LWs 14-16 and the most up-to-date and recommended monitoring regime provided in Technical Report 3.</li> </ul>	<p>The SWMP has been revised to reflect the latest layout for LWs 14-16 (e.g. see Figure 3) and to reflect the monitoring regime recommended by Alluvium in Technical Report 3 of the Extraction Plan (see Section 4.1.7).</p>	<p><b>SWMP</b> (Figure 2)</p>
<ul style="list-style-type: none"> <li>Replace Figure 3 with the approved longwall layout for LWs 11-16 (as approved by the Extraction Plan on 16 May 2017).</li> </ul>	<p>Figure 3 has been revised.</p>	<p><b>SWMP</b> (Figure 2)</p>
<ul style="list-style-type: none"> <li>Provide evidence of consultation with DRG and DPI-Water in relation to this version of the SWMP, and indicate how many matters raised have been addressed.</li> </ul>	<p>Section 1.5 and this Appendix have been revised to include further detail on consultation.</p>	<p>This table</p>
<ul style="list-style-type: none"> <li>Replace Figure 4 with the location of the approved longwall layout for LWs 11-16. Include the location and labelling of surface waters.</li> </ul>	<p>Figure 4 has been revised to show the location of mapped alluvium in the lower reaches of the creeks over the latest approved underground mine layout.</p>	<p><b>GWMP</b> (Figure 3)</p>
<ul style="list-style-type: none"> <li>Update Section 2.2.1 to include a discussion of the latest approved mining operations in the South Bates Underground Mine.</li> </ul>	<p>Section 2.2.1 has been revised to discuss the latest status of mining at Wambo.</p>	<p><b>WMP</b> Section 2.1.1</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<ul style="list-style-type: none"> <li>Update Figure 5 and Table 5 to reflect the monitoring points approved in the Extraction Plan.</li> </ul>	<p>Figure 5 and Table 5 have been revised to show the latest monitoring locations.</p>	<p><b>WMPProg</b></p>
<ul style="list-style-type: none"> <li>Update the data summaries in Section 2.2.3 (Tables 6 &amp; 7 and Figures 6 &amp; 7) to include the last 3 years of data.</li> </ul>	<p>The data in Table 6 (Surface Water Quality Ranges) was used to generate the surface water impact assessment criteria.</p> <p>It is not considered appropriate to continue to update baseline data during mining operations, as it may skew the impact assessment criteria. Monitoring results during operations are presented in Annual Reviews.</p> <p>Notwithstanding, Table 7 has been revised to include more recent flow monitoring data.</p>	<p><b>SWMP</b> (Section 3.4 – Review of Baseline Data)</p>
<ul style="list-style-type: none"> <li>Discuss the surface water quality impact criteria in Table 11 with the Department and DPI-Water.</li> </ul>	<p>The surface water impact assessment criteria for EC and TSS have been developed for low flow conditions based on 80th percentile of recorded concentrations and for high flow conditions based on maximum recorded concentrations. This is considered appropriate.</p> <p>The high salinity observed in the downstream section of North Wambo Creek (site SW05) was also observed in the 2003 Environmental Impact Statement for the Wambo Development Project. WCPL considers that the surface water quality impact assessment criteria in the SWMP are appropriate triggers for determining unanticipated changes to water quality at site SW05.</p>	<p><b>SWMP</b> (Section 3.0 – Surface Water Impact Assessment Criteria)</p>
<ul style="list-style-type: none"> <li>Indicate on Figure 5 and in Section 3.1 that the LDP is SW15.</li> </ul>	<p>Figure 5 and Section 3.1 have been revised.</p>	<p><b>SWMP</b> (Section 6.1.9) and <b>WMPProg</b></p>
<ul style="list-style-type: none"> <li>Confirm the number and location of monitoring sites and make the information in Section 4.1, Table 13 and Figure 5 consistent.</li> </ul>	<p>Section 4.1, Table 13 and Figure 5 are now consistent.</p>	<p><b>SWMP</b> (Section 6.0) and <b>WMPProg</b></p>
<ul style="list-style-type: none"> <li>Provide a summary of the bank and bed stability monitoring program applicable to the LW11 to 16 subsidence areas (Note: this may require an update of the programs in the FFMP).</li> </ul>	<p>The bed and bank stability monitoring program has been in operation at Wambo since 2006, and includes monitoring along natural creek lines (North Wambo Creek, Wambo Creek and Stony Creek) and the North Wambo Creek Diversion (including areas above Longwalls 11 to 16).</p> <p>Section 4.1.5 has been revised to refer to the latest Biodiversity Management Plan (which is proposed to address the requirements of the FFMP).</p> <p>Section 4.1.7 presents further detail on the specific monitoring that will occur for Longwalls 11 to 16.</p>	<p><b>SWMP</b> (Section 6.1.6) and <b>BMP</b></p> <p><b>SWMP</b> (Section 6.1.8 – Subsidence Monitoring) – see also <b>NWCD MP</b> (Appendix D of <b>SWMP</b>)</p>
<ul style="list-style-type: none"> <li>Provide a program to monitor the effectiveness of the ESCP.</li> </ul>	<p>Section 4.1.4 has been revised.</p>	<p><b>SWMP</b> (Section 6.1.5). See also <b>ESCP</b></p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<b>25 May 2017 and 5 July 2017 – DPIE Comments on WMP (and Sub Plans)</b>		
<b>SGWRP</b> <ul style="list-style-type: none"> <li>Update the SGWRP to reflect the modified layout for LWs 14-16.</li> </ul>	The SGWRP has been revised to reflect the latest layout for LWs 14-16 (e.g. see Figure 3).	<b>GWMP</b> (Figure 3)
<ul style="list-style-type: none"> <li>Replace Figure 3 with the approved longwall layout for LWs 11-16 (as approved by the Extraction Plan on 16 May 2017).</li> </ul>	Figure 3 has been revised.	<b>GWMP</b> (Figure 3)
<ul style="list-style-type: none"> <li>Revise TARPs to reflect revisions to the SWMP and GWMPs and make relevant to mining in LW14-16.</li> </ul>	The TARPs in Sections 2.3 and 2.4 are designed to account for all open cut and underground mining operations at Wambo (including Longwalls 14 to 16). A North Wambo Creek Subsidence Response Strategy (NWCSRS) is appended to the SGWRP that deals specifically with the South Bates Underground Mine.	<b>GWMP</b> (Section 7.0) and <b>SWMP</b> (Section 7.0) Note: NWCSRS is now appended to <b>NWCD MP</b> (Appendix D of <b>SWMP</b> )
<ul style="list-style-type: none"> <li>Discuss acceptable triggers for the relinquishment of water extraction rights with DPI-Water and include SGWRP.</li> </ul>	It is most appropriate to consider the relinquishment of water extraction rights to compensate for post mining closer to the end of the mine life. WCPL understands that this staged approach is available under the Development Consent.  DPI Water did not express any concerns with this approach in its review of the SGWRP.	<b>SWMP</b> (Section 7.3.3)
<ul style="list-style-type: none"> <li>Include response times for key actions within the TARPs.</li> </ul>	Additional clarification on the timing of actions has been included. Section 4.4 outlines response times for reportable environmental incidents.	<b>GWMP</b> (Section 7.0) and <b>SWMP</b> (Section 7.0)
<b>31 July 2017 – Independent Expert Scientific Committee (IESC) Comments on SWMP (Revision 11)</b>		
Monthly monitoring of metals and ions (including sulfate) is needed to establish a baseline and to develop suitable trigger values. After this period, event-based monitoring (including multiple samples to capture different stages of the hydrograph such as the rising and falling limbs), and regular monitoring at a frequency which captures the natural variability of the system as identified from the baseline data, will need to continue to allow prompt identification and investigation of exceedances of the trigger values.	WCPL will increase the sampling program to include monthly monitoring of metals and ions on six surface water monitoring locations (as outlined in Table 14) until March 2020. Representative sites surrounding WCPL are as follows: <ul style="list-style-type: none"> <li>USFM01 – upstream North Wambo Creek</li> <li>SW01- located upstream of Wambo Coal Operations;</li> <li>SW02- located downstream of Wambo Coal Operations;</li> <li>SW04 - North Wambo Creek upstream of North Wambo Creek Diversion;</li> <li>SW06 - South Wambo Creek upstream of Wambo Coal former operations; and</li> <li>SW08 - Stony Creek.</li> </ul>	<b>SWMP</b> (Section 6.0 - Monitoring) and <b>WMPProg</b>
The data used to calculate trigger values should be provided. The IESC is concerned that data from impacted sites was used to set trigger values. Data and associated metadata should be presented to show that only pre-impact data has been used in the calculation of the trigger values.	It is noted that mining first commenced in the Wambo area in 1969. Therefore, while the use “pre impact” data to characterise baseline conditions is ideal, it is not feasible at Wambo.	<b>SWMP</b> (Section 3.4 – Review of Baseline Data)

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>Water quality monitoring in the upstream reach of North Wambo Creek has historically occurred infrequently (i.e. four samples collected over 13 years) due to the intermittent nature of North Wambo Creek in this reach. Suitable reference sites need to be identified and monitored by the proponent to enable the calculation of appropriate trigger values for incorporation into TARPs. The reference sites must not be impacted by mining. The current trigger values represent water quality which has been impacted by mining, making these unsuitable for identifying potential mining impacts.</p>	<p>Monitoring site SW04 referred to in the IESC's comments is located upstream of Wambo and has not been directly impacted by mining to date. It is noted that the IESC's suggestion to establish a reference site comparable to the upstream reaches of North Wambo Creek would encounter similar practical difficulties associated with obtaining a suitable number of samples in a highly ephemeral system with a high proportion of sub-surface flow.</p> <p>Quality monitoring will commence at US FM1 (upper reaches of North Wambo Creek). No additional monitoring sites are proposed at this stage.</p>	<p><b>SWMP</b> (Section 6.0 - Monitoring) and <b>WMP</b>Prog</p>
<p>Trigger values should be calculated using the 20th and 80th percentiles as outlined in the ANZECC/ARMCANZ Guidelines (2000), not the less conservative 10th and 90th percentiles used by the proponent. Trigger values and associated TARPs should be initiated based on a single recorded exceedance of the 20th or 80th percentile values and not multiple exceedances over numerous months. A subsequent consecutive exceedance should initiate another level of the TARP.</p>	<p>Although ANZECC and ARMCANZ (2000) recommend 80th percentile values as being suitable for trigger values, a trigger would be initiated 20 percent of the time due to natural causes. Therefore, for the trigger to be a meaningful indicator of a possible mining effect, an investigation is to be triggered when the 90th percentile value is exceeded on two consecutive monitoring events.</p>	<p><b>SWMP</b> (Section 4.1 – Triggers) and <b>SWMP</b> (Section 7.3.1 – TARPs)</p>
<p>Further information regarding the water management system is needed. The water management plan should include this information and an up-to-date version of the water management system schematic.</p>	<p>This information is presented in Site Water Balance Revision 2 (WA-ENV-MNP-509.5), a component of the Site Water Management Plan.</p>	<p><b>WMP</b> Section 6.1 and <b>SWB</b></p>
<p>While the proponent has committed to updating the water balance annually it is unclear if this includes a commitment to update any other models that underpin the predictions of the water balance model. These should be regularly reviewed and updated as needed.</p>	<p>Regular reviews and updates to the numerical model have been undertaken as part of modifications to the Wambo Coal Mine.</p> <p>A site water balance was completed in support of the Extension of the Approved South Bates Mine (DA305-7-203, MOD 17, February 2017). Details on the assumptions of the model are included in the United Wambo Open Cut Coal Mine Project Site Water Balance (JV SWB), a component of the Surface Water Assessment completed in July 2016.</p> <p>The WCPL Site Water Balance document (WA-ENV-MNP-509.5, approved by DP&amp;E in 2015) will be revised to incorporate the findings of the JV SWB and resubmitted for consultation and approval.</p> <p>A review of the site water balance against model predictions is undertaken annually and presented in the Annual Review.</p>	<p><b>GWMP</b> (Section 5.3 – Groundwater Model Validation) and <b>GWMP</b> (Section 9.1.2 – Validation of Predictions)</p> <p>See also <b>SWB</b></p>
<p><b>31 July 2017 – Independent Expert Scientific Committee (IESC) Comments on GWMP</b></p>		
<p>Groundwater quality data for contaminants such as metals and other ions (e.g. sulfate) was not provided in the EA or in the proponent's environmental reporting (from July 2015 onwards (Peabody Energy 2017)) despite the proponent's groundwater monitoring plan stating that monitoring for these parameters had commenced in July 2015 (Peabody Energy 2015a). The current sampling frequency (i.e. annual)</p>	<p>Water quality triggers are defined for EC and pH as sufficient indicators of potential water quality impacts in the context of beneficial use, the criterion in the Aquifer Interference Policy.</p>	<p><b>GWMP</b> (Table 12 – Triggers)</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
will not provide data that is suitable for use in calculating or applying trigger values.		
<p>The current groundwater monitoring network does not contain any bores that are able to detect and provide early warning of potential drawdown in private bores located to the north, northwest and west of the proposed project.</p> <p>There are no monitoring bores located to the southwest and south of the proposed project; therefore, potential drawdown propagation in the direction of the World Heritage-listed Wollemi National Park will not be monitored.</p> <p>The IESC recommends that monitoring bores be installed in these areas and that the proponent commits to replace or repair any current monitoring bores which are damaged due to the proposed project such as through subsidence.</p>	<p>Additional groundwater monitoring bores have been and are being installed to the north and north-west of the Modification 17 area (P320, P321 and UG166A).</p> <p>There are no groundwater users (environmental or third-party users) to the south-west and south of the Modification 17 area, and therefore no additional groundwater monitoring to the south-west and south is proposed.</p>	<p><b>GWMP</b> (Section 6.0) See also <b>WMPProg</b></p>
<p>Water quality monitoring (for contaminants such as metals and ions) should be expanded to include the Permian aquifer. Sampling frequency in the Permian aquifer should be at least six-monthly, with frequency increased to a minimum of three-monthly in the alluvial aquifer where higher hydraulic conductivity and connectivity to surface water will cause more rapid changes in water quality parameters.</p>	<p>Water quality sampling is conducted in Permian bores P202, P203, GW12, GW21, GW22.</p> <p>There is limited use of the Permian aquifers and therefore further sampling is not considered warranted.</p>	<p><b>GWMP</b> (Section 6.0) See also <b>WMPProg</b></p>
<p>Baseline water quality data should be collected from representative reference bores in areas of the aquifers where mining impacts have not occurred.</p>	<p>Bore holes GW23, GW24, GW25 and GW26 were drilled late 2017 in North Wambo Creek. These bores will provide representative data prior to the commencement of mining in the South Bates Underground Extension Area (LW18-25)</p>	<p><b>GWMP</b> (Section 6.0) See also <b>WMPProg</b></p>
<p>The data used to calculate trigger values for both groundwater levels and quality should be provided. The IESC is concerned that data from impacted sites was used to set trigger values. Data and associated metadata (including for reference bores) should be presented to show that only pre-impact data has been used in the calculation of the trigger values.</p>	<p>It is noted that mining first commenced in the Wambo area in 1969. Therefore, while the use of “pre-impact” data to characterise baseline conditions is ideal, it is not feasible at Wambo. A full statistical analysis for data up to April 2015 is included as Table 7.</p>	<p><b>GWMP</b> (Table 8)</p>
<p>Trigger values should be calculated using the 20th and 80th percentiles as outlined in the ANZECC/ARMCANZ Guidelines (2000), not the less conservative 10th and 90th percentiles used by the proponent. Trigger values and associated TARPs should be initiated based on a single recorded exceedance of the 20th or 80th percentile values and not multiple exceedances over numerous months. A subsequent consecutive exceedance should initiate another level of the TARP.</p>	<p>As described in Section 3.2 of the GWMP, although ANZECC and ARMCANZ (2000) recommend 80th percentile values as being suitable for trigger values, a trigger would be initiated 20% of the time due to natural causes. Therefore, for the trigger to be a meaningful indicator of a possible mining effect, an investigation is to be triggered when the 90th percentile value is exceeded on two or three consecutive monitoring events.</p>	<p><b>GWMP</b> (Sections 4.1 and 4.2)</p>

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
<p>The groundwater management plan should include commitments from the proponent to undertake a thorough review of the groundwater model given it has been revised over a number of years to accommodate multiple modifications to mining at the Wambo Mine Site. This makes it difficult to identify the calibration and parameterisation history of the model and hence to appraise its ability to accurately predict project-specific and cumulative impacts.</p>	<p>The regular reviews and updates to the numerical model undertaken as part of modifications to the Wambo Coal Mine has improved the performance of the numerical model through regular re-calibration and validation.</p> <p>The most recent calibration of the numerical model is documented in the MOD 12 Environmental Assessment (HydroSimulations, 2016a).</p> <p>The most recent validation and model run is documented in the MOD 17 Environmental Assessment (HydroSimulations, 2017).</p> <p>Both reports are in the public domain.</p>	<p><b>GWMP</b> (Sections 3.6 and 3.7)</p>
<p>The groundwater management plan should include commitments from the proponent to regularly validate the groundwater model predictions. The groundwater management plan should include commitments from the proponent to regularly update the groundwater model as recommended by the Australian Groundwater Modelling Guidelines (Barnett et al. 2012).</p>	<p>WCPL undertakes a comprehensive review of groundwater monitoring results annually against the groundwater model predictions in the Annual Review (Condition 5, Schedule 6 of the Development Consent DA 305-7-2003).</p> <p>In addition, as part of each Extraction Plan application, WCPL is required to present a revised assessment of potential impacts and environmental consequences incorporating relevant monitoring data obtained since the approval (Condition 22D, Schedule 4 of the Development Consent DA 305-7-2003).</p>	<p><b>GWMP</b> (Sections 9.1.1 and 9.2.1 – Annual Review)</p>
<p>The groundwater management plan should include commitments from the proponent to clearly define the level of variance between groundwater observations and model predictions that will trigger a review of the groundwater model.</p>	<p>A review of monitoring results against the numerical model predictions is undertaken annually and presented in the Annual Review. It is not considered appropriate to define a set level of variance given the complexity of the natural environment and the influence of other potential factors (e.g. climatic conditions or changes in mine progression).</p>	<p><b>GWMP</b> (Sections 9.1.2 and 9.2.1 – Annual Review)</p>
<p><b>December 2017 – DPIE Water (formerly CLWD) Comments on WMP (Revision F)</b></p>		
<p>...CLWD recommends the following is undertaken prior to the Department of Planning's endorsement of the WMP</p>		
<p>The Department of Planning and Environment engages an independent expert to advise if leakage from South Wambo Dam has resulted in contamination of the alluvial aquifer of South Wambo Creek;</p>	<p>Noted.</p> <p>HydroSimulations has prepared a report (under review) titled Update on Possibility of Mine Water Seepage to Wollombi Brook (April 2018)</p>	<p><b>GWMP</b> (Section 6.4.2) – Report provided to DPIE and NRAR/DPIE Water on 22 Nov 2018<sup>1</sup></p>
<p>In consultation with Crown Lands and Water, WCPL expands the observation bore network within and beneath the area of alluvial aquifers and mapped GDEs. This is to ensure that future groundwater model revisions can capture and predict important localised impacts;</p>	<p>SLR completed installation of monitoring bores in the North Wambo Creek alluvium in 2017. The lack of alluvial groundwater present during the drilling (despite recent rain at the time of the drilling) does not support further drilling.</p>	<p><b>GWMP</b> (Section 6) See also <b>WMPProg</b></p>
<p>The WMP set a requirement to measure water quality for water seeping into the open cut and underground mine workings</p>	<p>WCPL conducts monitoring through an extensive network of boreholes. Further investigations will be conducted in 2018 to seek improvements to the overall site water management and direct monitoring of seepage into the open cut or underground workings.</p> <p>The water quality of inflows to the underground workings and the open cut are measured indirectly through monthly water quality monitoring of mine water storages.</p>	<p><b>SWMP</b> (Section 6.1.10) See also <b>WMPProg</b></p>



Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
	This is the most practical method to routinely sample for water quality. An unexpected increase in water make or change in water quality of mine water storages would be investigated by Wambo. If warranted, direct measurement of water quality at the source of inflow may be conducted. (Refer to Section 4.1.9.)	
The Surface and Ground Water Trigger Action Response Plan must link to monitoring bores with defined thresholds listed in the Groundwater Monitoring Plan. Observation sites listed for North Wambo Creek alluvium have no defined triggers that hold WCPL accountable to impacts and the licensable take of water.	The Mine is approved to have an impact on North Wambo Creek alluvium and the licensable take of water has been predicted by HydroSimulations (2016a, 2017).  WCPL is held accountable to its licensing volumes through the monitoring of inflow volumes.	<b>GWMP</b> (Table 17 – TARP for Impacts on North Wambo Creek Alluvium)
<b>25 March 2018 – DPIE Letter – ESCP and EMS</b>		
The Department has reviewed the Erosion and Sediment Control Plan (Revision 9) for the Wambo Mine Complex and is considers that the ESCP does not adequately address the relevant requirements of DA305-7-2003 and DA177-8-2004. The Department's comments are enclosed in Attachment A.	N/A	N/A
<p>The ESCP does not address the requirements of Managing Urban Stormwater: Soils and Construction – Volume 2E mines and quarries (DECC 2008), Appendix C: Erosion and sediment control planning.</p> <p>Action Required: Revise the ESCP to ensure consistency with Managing Urban Stormwater: Soils and Construction – Volume 2E mines and quarries (DECC 2008), Appendix C</p>	<p>The following sections make reference to Managing Urban Stormwater: Soils and Construction – Volume 2E mines and quarries (DECC 2008), Appendix C (also known as the Blue Book):</p> <ul style="list-style-type: none"> <li>• Section 1.2 – Purpose;</li> <li>• Section 4.1 – Principles;</li> <li>• Table 4 – Sediment Dam Risk Analysis;</li> <li>• Section 5.1 - Design Guidelines ;</li> <li>• Section 6.6 – Worked Water;</li> <li>• Section 6.8 – Subsidence Management; and</li> <li>• Section 7.1 – All Control Structures.</li> </ul>	<p><b>ESCP:</b></p> <ul style="list-style-type: none"> <li>• Section 4.2.1 – Principles</li> <li>• Table 7: Design Criteria</li> </ul> <p><b>WMP:</b></p> <ul style="list-style-type: none"> <li>• Section 3.2 (Policies, Guidelines and Standards)</li> <li>• Table 9: Design Criteria</li> <li>• Section 4.1.2 (Dirty Water Management)</li> <li>• Section 5.1.3 (Erosion and Sediment Controls)</li> </ul>
<p>Section 5. discusses the 'Design Guidelines' and Appendix D 'Design Principles'. However it is unclear if the current sediment and erosion controls have been constructed in accordance with the referenced guidelines and principles.</p> <p>Action Required: Integrate the descriptions of erosion and sediment control structures, location, function and capacity. For example, update Table 5 to include the type of erosion and sediment control structure at</p>	Refer to Section 5.0. In March 2018, SLR finalised an assessment of existing dam capacities at Wambo against the requirements of the Blue Book and current best practice. The SLR report concludes 'where the existing dam storage capacity is known, all of the sediment dams comply with the Blue Book requirements and all of the mine water dams are sufficiently sized to contain runoff from the 100 year ARI, 24 hour duration and 72 hour duration design storm events'	<b>ESCP</b> (Section 5.1.1 – ESC Management Structures)

Comment	Consideration of Comment in previous versions of the WMP	Where addressed in this WMP
each location. Include a reference to the relevant design principles applied to each structure.		
The use of the word 'should' throughout the ESCP is to be replaced with 'shall' or 'will' or similar. Please check the document for noncommittal wording and replace.	Complete, refer to changes throughout in blue font.	ESCP (font now black)
The ESCP does not reference the additional mining lease required by the approval of the South Bates Underground Extension (MOD17). All mining lease areas need to be included with the lease boundaries shown on the mine layout plan.	A Mining Lease Application has not yet been lodged for the portion of South Bates Underground Extension not currently subject to a Mining Lease. The Approved Wambo Coal Mine Layout (Figure 3) will be revised to include the new Mining Lease, once approved.	ESCP (Figure 1)
Section 3.4 (hydrology) should include comment on the area subject to MOD 17 that comprises a section of North Wambo Creek above the diversion	See text added to Section 3.4.	ESCP (Section 3.3)
Condition 4, Schedule 6 outlines the requirements of all management plans. Please ensure the ESCP addresses these requirements.	The requirements of Condition 4, Schedule 6 are listed in Table 2 which also provides section links to where each requirement is addressed in the ESCP.	ESCP (Table 1)
<b>27 June 2018 – DPIE Letter - ESCP</b>		
The Department has reviewed the Erosion and Sediment Control Plan (Revision 10) for the Wambo Mine Complex and is satisfied that it adequately addresses the relevant requirements of DA305-7-2003 and DA177-8-2004. As such the Secretary approved this management plan.	N/A	N/A
<b>7 September 2018 – DPIE Letter - Extraction Plan for SBU LWs 17-20</b>		
The Department has reviewed the Extraction Plan and is satisfied that it meets the Da requirements. The Department is awaiting confirmation from NRAR that the Water Management Plan and subsequent information satisfactorily satisfies their concerns. The Department will further liaise with WCPL, if necessary, once this information is received. Nevertheless, the Water Management Plan can be considered approved and should be implemented.	N/A	N/A
<b>4 June 2019 – DPIE Letter - Comments on Extraction Plan for SBU LWs 17-20 (Revised Layout)</b>		
The Secretary approves the revised Extraction Plan for Longwalls 17-20.	N/A	N/A

1. Report titled "Update on Possibility of Mine Water Seepage to Wollombi Brook" (HydroSolutions, 2018) was provided to DPIE and NRAR/DPIE Water Group on 22 November 2018. Findings of the report were presented on 26 September 2018. A general update on issues was provided on 9 April 2020.

## **APPENDIX B - WMP Summary of Commitments**

## Water Management Plan – Summary of Commitments

**Note: The list of commitments in this appendix is in addition to those explicitly required by Development Consent conditions.**

WMP Section	Commitment	Timing
1.4	As the monitoring program is now shared with the United Wambo Open Cut Mine, a separate shared document has been developed and will be submitted to DPIE for review and approval ( <b>WMPProg</b> ).	Prior to Phase 2 commencing
2.2.2	Groundwater triggers will be developed as part of the <b>GWMP</b> where they will seek to follow the objectives of the NSW State Groundwater Policy.	As required
2.2.8	Water imported to site, water used onsite and water discharged from site will be monitored in accordance with Water Reporting Requirements for Mines (DWE Water undated).	As required
2.5.1 and 2.5.2	WCPL will report performance against relevant water licence conditions in the Annual Review.	Annually
4.1.1	Clean water controls will be augmented with the construction of new drains and dams as required to accommodate any changes to the surface facilities disturbance footprint (increase or decrease).	As required
4.1.2	The dirty water management system will be constructed in accordance with Managing Urban Stormwater: Soils and Construction (the Blue Book), Volumes 1 and 2E – Mines and Quarries (Landcom 2004 and DECC 2008).	As required
	As mining progresses, runoff from disturbed areas will be managed within the water management system and reused or, if water quality meets required guidelines (refer United Wambo Surface Water Management Plan), released to downstream waterways.	As required
	Where the dams form part of permanent infrastructure, they will be designed with spillways suitable for conveyance of the 100 year ARI peak flow event, with 300 mm freeboard provided, assuming dams are full.	As required
	The dams will spill into natural undisturbed clean water areas in the event that the design rainfall depth is exceeded and be released from site.	As required
4.1.3	Mine water will be contained in storages (including open cut pits and underground voids), suitably designed, installed and maintained to convey and contain runoff from the 100 year, 24 hour ARI storm event.	Ongoing
	Tailing storage areas will be suitably designed, installed and maintained to encapsulate and prevent the migrating of tailings seepage offsite. Overburden will be monitored for saline seepage as per the United Wambo Surface Water Management Plan.	Ongoing
5.1.1	The Wambo water management system (WMS) will be constructed and modified as and when required so as to support the infrastructure and mine development.	As required
	Wambo will manage the water associated with the following tailings storage facilities (TSF) - North East Tailings Dam, Hunter Pit Tailings Dam, Homestead Main Pit TSF and South Bates Pit TSF (proposed for future storage)	As required
	In the event that a dirty or mine water pipeline is located in a clean water catchment, additional controls will be implemented to mitigate offsite discharges	As required
	Pipelines should be buried across creeks and drainage lines and should be double skinned or sleeved to minimise physical damage and/or to contain potential leakages.	As required
5.1.2	Where possible, all sections of mine water pipelines will run through mine water catchments so that any leaks in the pipes in these areas will flow into mine water storages.	As required
	In the event that a dirty or mine water pipeline is located in a clean water catchment, additional controls will be implemented to mitigate offsite discharges including differential flow meters or pressure sensors and pump cut offs at pre-determined levels.	As required

WMP Section	Commitment	Timing
5.1.3	Erosion and sediment control measures at Wambo will be implemented and undertaken in accordance with the <b>ESCP</b> .	As required
5.1.4	Water will be extracted from the Hunter River and Wollombi Brook as required and approved under the existing WALs.	As required
	Surplus water will be discharged as required and in accordance with EPL 529 and consistent with the provisions of the HRSTS. Discharges will be monitored prior to release to ensure compliance with the requirements of the HRSTS and in accordance with EPL conditions.	As required
5.1.5	Water will be imported and exported on an as needs basis subject to commercial agreements.	As required
5.1.7	Decommissioning of boreholes will be undertaken in accordance with standards equivalent to or exceeding the Minimum Construction Requirements for Water Bores in Australia (NUDLC 2012).	As required
5.1.8	Above-ground storage tanks containing materials likely to cause environmental harm will be: <ul style="list-style-type: none"> <li>• Imperviously bunded with a capacity of 110% that of the largest container stored within the bund;</li> <li>• Designed and constructed in a manner which prevents the ingress of rainwater into the tanks; and</li> <li>• Clearly labelled to identify content.</li> </ul>	At all times
5.2 and 5.3	The site water and salt balance will be recalculated on an annual basis and reported in the Annual Review.	Annually
5.4	Results from monitoring undertaken as part of the <b>WMPprog</b> will be compared to groundwater model predictions, as part of the Annual Review process.	Annually
	The groundwater model will be validated every 5 years, using data collected from the water monitoring program. This process will be coordinated by Wambo and reported on in the Annual Review.	Annually
5.5	The water balance model will be updated throughout the mine life to forecast supply reliability as part of the water management planning process.	As required
	In the event of reductions in the forecast reliability due to low rainfall conditions, water conservation measures (such as the use of synthetic dust suppressants) will be implemented.	As required
5.6	General training on the aspects of the WMP (and sub plans) will be provided to all employees and contractors through the WCPL site induction process.	Ongoing
	Selected site personnel whose duties directly involve the management of water at Wambo will undertake specific training in regards to site operational procedures which incorporate water management measures. This training will be undertaken annually and when there is a change in personnel in key roles.	Annually and as required
6.1	WCPL will monitor rainfall, water usage, fresh water imported to site, the transfers of water around site and the volume of water stored in designated storages on the site.	Ongoing
6.2	As part of the ongoing water balance monitoring the groundwater inflows to the mining pits and underground will be reviewed quarterly. This will be undertaken by review of available data (including flow metering data or pump hours, site daily rainfall data and site survey data) to estimate groundwater inflows to the mining operations.	Quarterly
6.3	Routine inspections of water structures, including dams, drop structures, diversion drains and erosion and sediment control structures, as well as inspections following significant rainfall events (greater than 25 mm in 24 hours), will be conducted by Wambo personnel.	As per <b>ESCP</b>

WMP Section	Commitment	Timing
	The frequency of pipeline inspections will be determined through risk assessment, however all major operational pipelines and high risk pipelines are to be inspected weekly when in use, as a minimum.	Weekly when in use
7.0	All water related community complaints will be recorded within the Community Complaints Register.	As received
	The Monthly Environment Monitoring Report will include details of all community complaints.	Monthly
8.1	<p>If an exceedance of these criteria and/or performance measures occurs, WCPL will, at the earliest opportunity:</p> <ul style="list-style-type: none"> <li>• Take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;</li> <li>• Undertake an investigation into the cause of the exceedance and contributing factors. This investigation may involve collaboration with personnel at the United Wambo Open Cut Operations, depending on the nature, location and potential cause of the exceedance;</li> <li>• Consider all reasonable and feasible options for remediation (where relevant) and submit a report to DPIE describing those options and any preferred remediation measures or other course of action; and</li> <li>• Implement remediation measures as directed by the Planning Secretary, to the satisfaction of the Planning Secretary.</li> </ul>	As required
8.2	WCPL will respond to identified unforeseen water impacts in accordance with the procedure described in <b>Section 8.2</b>	As required
8.3	<p>In the event that WCPL identifies a failure to comply with a statutory requirement, WCPL will:</p> <ul style="list-style-type: none"> <li>• Undertake an investigation into the failure;</li> <li>• Identify suitable strategies or actions to be implemented to address the failure (and avoid a recurrence of the failure); and</li> </ul> <p>Report the non-compliance in accordance with the requirements of the development consents.</p>	As required
8.4	In the event that WCPL receives a complaint from a landholder regarding their water supply, WCPL will investigate the complaint to determine if the impact was caused by WCPL's mining operations. If this can be proven, WCPL will consult with DPIE Water on appropriate compensatory water supply arrangements.	As required
9.1.1	Review Wambo's environmental performance as part of the Annual Review.	Annually
9.1.2	Every year the site water balance, surface water take and groundwater model will be validated by comparing predicted results to monitoring results collected over the life of the development. This will be undertaken as part of the Annual Review process.	Annually
	Every five years the validity of the model predictions will be assessed and if the data indicates significant divergence from the model predictions, an updated groundwater model will be constructed for simulation of mining.	5 yearly
9.1.3	<p>Review the WMP prior to new underground mining areas being developed and/or within three months of:</p> <ul style="list-style-type: none"> <li>• the submission of an Annual Review;</li> <li>• the submission of a water-related incident report;</li> <li>• the submission of an Independent Environmental Audit: or</li> <li>• any modification to the conditions of consent (unless the conditions require otherwise).</li> </ul>	As required



WMP Section	Commitment	Timing
9.2.1	<p>Report on the following in the Annual Review:</p> <ul style="list-style-type: none"> <li>• any significant findings regarding the implementation of the WMP</li> <li>• details of any incidents or non-compliances relating to water</li> <li>• water extracted or discharged from the site each year (direct and indirect), including water taken under each water licence.</li> <li>• monitoring results including water level and quality</li> <li>• comment on the interaction/connectivity of the open cut and underground area and on the degree of match of the predicted versus observed water levels</li> <li>• predictions, actual and licensing requirements</li> </ul> <p>An experienced hydrogeologist will review measured water levels and determine when water levels deviate significantly from that predicted by the groundwater model and determine the reason for this deviation. The review will consider the impact of mining, and other factors that could result in declining water levels including climatic conditions, rainfall recharge and pumping from private (and mine owned) bores.</p> <p>The Annual Review will also identify if any additional monitoring sites are required, or if optimisation of the existing monitoring sites, frequency of sampling and analytical suites should be undertaken.</p> <p>Provide the Annual Review to DPIE and other relevant agencies prior to the end of March each year and make a copy available on the WCPL website.</p>	Annually
9.2.4	Report incidents as per the <b>Section 9.2.4</b> .	As required
9.2.5	Report non compliances as per the <b>Section 9.2.5</b> .	As required
9.2.6	Report results as per the <b>Section 9.2.6</b> .	As required
9.2.7	Keep WCPL website up to date.	As required

## **APPENDIX C - Other Requirements Relating to Water Management**

**Table A: DA305-7-2003 Conditions relevant to Water Management**

Condition	Requirements	Section									
B51	<p><b>Soil Erosion</b> The Applicant must install and maintain suitable erosion and sediment control measures on the site, in accordance with the relevant requirements in the guidance series Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004) and 2E Mines and Quarries (DECC, 2008).</p>	<b>Section 5.1.3 and ESCP</b>									
B52	<p><b>Water Supply</b> The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.</p>	<b>Section 5.4</b>									
B53	<p>The Applicant must report on water extracted or discharged from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.</p> <p><i>Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain all necessary water licences for the development, including during rehabilitation and post mine closure.</i></p>	<b>Section 9.2.1</b>									
B54	<p><b>Pollution of Waters</b> Except as may be expressly provided by an EPL, the Applicant must comply with section 120 of the POEO Act while carrying out the development.</p>	<b>Section 2.1.2</b>									
B55	<p><b>Discharge Limits</b> Except as may be expressly provided by an EPL or the Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002, the Applicant must: (a) not discharge more than 250 ML/day in total from the licensed discharge point/s at the development; and (b) ensure that the discharges from licensed discharge point/s comply with the limits in Table 7.</p> <p><i>Table 7: Discharge limits</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>100 percentile concentration limit</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>pH</td> <td>6.5 to 9.5</td> </tr> <tr> <td>Total suspended solids</td> <td>mg/litre</td> <td>120</td> </tr> </tbody> </table> <p><i>Note: This condition does not authorise the pollution of waters by any other pollutants.</i></p>	Pollutant	Units of measure	100 percentile concentration limit	pH	pH	6.5 to 9.5	Total suspended solids	mg/litre	120	<b>SWMP and WMPProg</b>
Pollutant	Units of measure	100 percentile concentration limit									
pH	pH	6.5 to 9.5									
Total suspended solids	mg/litre	120									
B56	<p><b>Compensatory Water Supply</b> The Applicant must provide a compensatory water supply to any landowner of privately-owned land whose rightful water supply is adversely and directly impacted (other than an impact that is minor or negligible) as a result of the development, in consultation with DPIE Water, and to the satisfaction of the Planning Secretary.</p>	<b>Section 8.4</b>									
B57	<p>The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent, in quality and volume, to the loss attributable to the development. Equivalent water supply should be provided (at least on an interim basis) as soon as practicable after the loss is identified, unless otherwise agreed with the landowner.</p>										
B58	<p>If the Applicant and the landowner cannot agree on whether the loss of water is to be attributed to the development or the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Planning Secretary for resolution.</p>										

Condition	Requirements	Section
B59	<p>If the Applicant is unable to provide an alternative long-term supply of water, then the Applicant must provide compensation, to the satisfaction of the Planning Secretary.</p> <p>Note: <i>The Water Management Plan (see condition B66) is required to include trigger levels for investigating potentially adverse impacts on water supplies.</i></p>	
B60	<p><b>Water Management</b> The Applicant may receive water from, and transfer water to, neighbouring mines including HVO, MTW and United Wambo open cut coal mine.</p>	<b>Section 5.4</b>
B61	<p>The Applicant may integrate the site water management system with water management for the Wambo train loading facility and United Wambo open cut coal mine.</p>	<b>Sections 1.5 and 4.1</b>
B64	<p><b>Groundwater Dependent Ecosystem Study</b> Within 12 months of the determination of Modification 17, or as otherwise agreed with the Planning Secretary, the Applicant must commission and provide to the Planning Secretary for approval, a Groundwater Dependent Ecosystem Study report. This study must:</p> <ul style="list-style-type: none"> <li>(a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;</li> <li>(b) be developed in consultation with DPIE Water;</li> <li>(c) provide advice on the likely level of groundwater dependence of the vegetation in the South Bates Extension Area given current groundwater levels and expert knowledge of the vegetation communities in the region;</li> <li>(d) in the event it is considered that vegetation communities in the vicinity of the South Bates Extension Area are groundwater dependent (either entirely or partially), provide advice on the likelihood that subsidence associated with the South Bates Extension Area could cause adverse impacts and how any such impacts would manifest;</li> <li>(e) consider to what degree the cumulative impacts of adjacent mining operations may have already impacted groundwater dependent vegetation across the South Bates Extension Area;</li> <li>(f) provide any recommendations that would assist in assessing the potential fracture interconnections between surface water resources and hard rock aquifers that may impact on groundwater dependent vegetation; and</li> <li>(g) include a management and/or remediation program that describes measures that could be implemented to ensure compliance with the performance measures in Table 1 or Table 8 for any groundwater dependent endangered ecological community.</li> </ul>	<b>GWMP</b>
B65	<p>The Applicant must take into account the findings of the Groundwater Dependent Ecosystem Study and not less than 2 years of monitoring results obtained under condition B7 in the preparation of any Extraction Plan for Longwalls 23 – 25.</p>	<b>Noted</b>

**Table B: DA177-8-2004 Conditions relevant to Water Management**

Condition	Requirements	Section
B4	<p><b>Soil Erosion</b> The Applicant must install and maintain suitable erosion and sediment control measures on the site, in accordance with the relevant requirements in the guidance series Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004) and 2E Mines and Quarries (DECC, 2008).</p>	<b>Section 5.1.3 and ESCP</b>
B5	<p><b>Water Supply</b> The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.</p> <p>Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain all necessary water licences for the development, including during rehabilitation and post mine closure.</p>	<b>Section 5.4</b>
B6	<p><b>Pollution of Waters</b> Except as may be expressly provided by an EPL, the Applicant must comply with section 120 of the POEO Act while carrying out the development.</p>	<b>Section 2.1.2</b>
B7	<p><b>Water Management</b> The Applicant may receive water from, and transfer water to, neighbouring mines including HVO, MTW, Wambo mine and United Wambo open cut coal mine.</p>	<b>Section 5.4</b>
B8	<p>The Applicant may integrate the site water management system with water management for Wambo mine and United Wambo open cut coal mine.</p>	<b>Sections 1.5 and 4.1</b>

**Table C: EA Commitments relevant to Water Management and Monitoring**

EA Reference	Commitment	Where addressed
<b>Surface Water Assessment (Umwelt, 2016a)</b>		
Appendix 11, Section 6.3.1	Any significant change in pH (in sediment dams) will trigger further analysis of metal/metalloid concentrations in runoff water and this requirement will be included in the Surface Water Monitoring Program.	<b>WMProg</b>
Appendix 11, Section 8.0	The existing monitoring program will be updated as part of the implementation of the Project, including development of specific triggers around low pH and associated monitoring of metals/metalloids.	<b>WMProg</b>
Appendix 11, Section 9.2.2	As part of the water balance monitoring, water imported to site, water used onsite and water discharged from site will be monitored in accordance with Water Reporting Requirements for Mines (NOW undated).	<b>WMProg and SWB</b>
Appendix 11, Section 9.2.5	Flow monitoring on the Wambo Creek and North Wambo Creek, and Wollombi Brook (by DPIE Water) will continue to be undertaken on a continuous basis as documented in the existing water monitoring plans. The flow monitoring will be undertaken by Wambo, although this data will be shared with United.	<b>WMProg</b>
<b>Groundwater Assessment (AGE, 2016)</b>		
Appendix 12, Section 10.2	<p>The full groundwater quality suite will be expanded in order to include key analytes to determine any changes in beneficial groundwater use (i.e. livestock drinking water). The revised full suite will include:</p> <ul style="list-style-type: none"> <li>• physio-chemical indicators – pH, electrical conductivity, total dissolved solids;</li> <li>• major ions – calcium, fluoride, magnesium, potassium, sodium, chloride, sulphate;</li> <li>• total alkalinity as CaCO<sub>3</sub>, HCO<sub>3</sub>, CO<sub>3</sub>; and</li> </ul> <p>dissolved and total metals – aluminium, arsenic, barium, boron, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, strontium, silver, vanadium and zinc.</p>	<b>WMProg</b>
Appendix 12, Section 10.2	Similar to the water level monitoring, yearly reporting of the water quality results from the monitoring network should be included in the annual review. The annual review should consider if any additional monitoring sites are required, or if optimisation of the existing monitoring sites, frequency of sampling and analytical suite should be undertaken.	<b>Section 9.2.1</b>
Appendix 12, Section 10.3	Trigger levels will be derived for water quality parameters as part of the development of the Water Management Plan.	<b>WMProg</b>
Appendix 12, Section 10.3.1	Should post mining water quality data for these selected key parameters reach the trigger levels, then further detailed analysis of all water quality data will occur. Should this analysis indicate trends not consistent with historical variation, then the mitigation process and strategies will be implemented.	<b>WMProg</b>



EA Reference	Commitment	Where addressed
Appendix 12, Section 10.3.2	An annual review should compare the measured groundwater levels in the monitoring bores with the model predicted levels. Judgement of an experienced hydrogeologist will determine when water levels deviate significantly from that predicted by the groundwater model and determine the reason for this deviation. The review should consider the impact of mining, and other factors that could result in declining water levels including climatic conditions, rainfall recharge and pumping from private (and mine owned) bores.	<b>Section 9.2.1</b>
Appendix 12, Section 10.3.2	Water levels in bores located outside the predicted zone of influence will be assessed annually against a trigger level. If groundwater levels fall below the 5th percentile water level established from the preceding 24 months for a period of 30 days or over, a triggering event occurs.	<b>WMProg</b>
Appendix 12, Section 10.4	<p>It is recommended that monitoring of mine water seepage be undertaken, particularly to identify seepage rates and quality. Samples should be collected of pumped seepage with the objective of providing an early indication of any mixing of shallow alluvial groundwaters with the Permian strata.</p> <p>Water quality analysis should be similar as for the groundwater monitoring bores. The seepage monitoring program should include:</p> <ul style="list-style-type: none"> <li>• measurement of water pumped from the mining areas using flow meters or other suitable gauging apparatus;</li> <li>• monitoring quality of water pumped from the mining areas (full water quality suite);</li> <li>• correlation of rainfall records (and catchments) with mining area seepage records so groundwater and surface water can be separated; and</li> </ul> <p>monitoring of coal moisture content.</p>	<b>WMProg</b>
Appendix 12, Section 10.5	Every five years the validity of the model predictions would be assessed and if the data indicates significant divergence from the model predictions, an updated groundwater model would be constructed for simulation of mining.	<b>Section 9.1.2</b>
Appendix 12, Section 10.6	<p>It is recommended data management and reporting includes:</p> <ul style="list-style-type: none"> <li>• annual assessment of departures from identified monitoring data trends and comparison against specified trigger levels;</li> <li>• formal review of depressurisation of coal measures and alluvial aquifers should be undertaken annually by a suitably qualified hydrogeologist, with the frequency reviewed as the Project progresses;</li> <li>• annual reporting (including all water level, water quality and mine water seepage data); and</li> </ul> <p>all groundwater data should be stored in a database customised for the Project and with suitable QA/QC controls.</p>	<b>WMProg</b>
Appendix 12, Section 10.7	Should monitoring indicate the changes in groundwater levels and quality, and surface waters are more extensive or significant than predicted, mitigation measures will be considered.	<b>Section 8.2</b>

**Table D: 2017 IEA Recommendations relevant to Water Management and Monitoring (Hansen Bailey, 2018)**

Recommendation (as per Table 9 of the 2017 IEA Report (Hansen Bailey, 2018))	Section
It is recommended that WCPL also collect water quality data from sediment dams in order to characterise the quality of runoff from non-coal affected catchments.	<b>SWMP and WMPProg</b>
Consideration should be made to directly monitor the quality of groundwater seepage reporting to the underground and open-cut workings.	<b>GWMP and WMPProg</b>
It is suggested that the salt balance be updated annually to include the seepage quality monitoring data.	<b>Section 5.3 and SWB</b>
WCPL should determine the frequency of monitoring to apply for the salt balance model.	<b>SWB and WMPProg</b>
Section 2.2.16 of the Site Water Management Plan outlines rehabilitation objectives for decommissioning water management structures on site. It is recommended that this section is improved by providing a high level strategy for the decommissioning of water management structures (including the management of water during the decommissioning process) as part of any future update of the Site Water Management Plan.	<b>SWMP</b>
It is recommended that the Site Water Management Plan is updated to include the predicted salt balance.	<b>SWB and WMPProg</b>
<p>The GWMP should be updated with the suggestions provided by NSW government subsequent to approval of the GWMP in November 2015 and resubmitted. Updates should include:</p> <ul style="list-style-type: none"> <li>• A more contemporary reference to groundwater sampling techniques;</li> <li>• Amendment of the text relating to purging of groundwater bores to be consistent with the latest guidelines;</li> <li>• Outline the methods of water quality data upload from the laboratory;</li> <li>• The bore labels in Figure 7 need to be clear for all bores; and</li> <li>• General update of text relating to historical or proposed activities.</li> </ul>	<b>GWMP and WMPProg</b>
Update GWMP to include Montrose Dam prior to its construction.	<b>GWMP</b>
<p>AGE made the following recommendations for future groundwater modelling and assessments (see Appendix F):</p> <ul style="list-style-type: none"> <li>• Future groundwater modelling updates/reports need a clear description of the interactions/connectivity of the open cut and underground area and how this is represented in the modelling;</li> <li>• Future groundwater modelling updates/reports should comment on the interaction/connectivity of the open cut and underground areas and whether it is visible in the observational data;</li> </ul>	<b>Section 9.2.1</b>
Future annual groundwater monitoring reviews should comment on the interaction/connectivity of the open cut and underground area and on the degree of match of the predicted versus observed water levels. The predictions, actual and licensing requirements should be included in a tabular format in each Annual Review.	<b>Section 9.2.1</b>
The status of the single groundwater licence under the <i>Water Management Act</i> 2000 should be regularly followed up with DPI-Water	<b>Table 7<sup>1</sup></b>

1. Refer WAL 42373

**Table E: EPL Conditions relevant to Water Management**

Condition	Requirements				Section
P1.3	The following points referred to in the table are identified in this licence for the purposes of monitoring and/or the setting of limits for discharges or pollutants to water from the point.				<b>SWMP and WMProg</b>
	<b>EPA ID No</b>	<b>Type of Monitoring Point</b>	<b>Type of Discharge Point</b>	<b>Location Description</b>	
	4	Discharge of saline water under the Hunter River Salinity Trading Scheme (HRSTS) Discharge quality Volume monitoring	Discharge of saline water under the Hunter River Salinity Trading Scheme (HRSTS) Discharge quality Volume monitoring	HRSTS Outlet from Eagles Nest Dam at co-ordinates 313132 6393073 (Easting Northing) labelled as EPA4 on plan titled "Wambo Mine Environment Protection Licence 529 Plan of Premises – Monitoring Sites" DWG 2160-2 dated 3/3/2017 APE Ref DOC17/147944	
	9	Surface Water Monitoring		Surface water quality must be measured at locations representative of impacts likely to be experienced outside the premises as a result of the operation of the mine	
	18	Discharge quality monitoring	Discharge quality monitoring	STP Discharge monitoring point at coordinates 312057 6393219 (Easting and Northing) defined as STPD1 on plan titled "Wambo Mine Environment Protection Licence 529 Plan of Premises – Monitoring Sites" DWG 2160-2 dated 3/3/2017 APE Ref DOC17/147944	
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.				<b>Noted</b>
L2.1	For each monitoring/discharge point or utilisation area specified in the table(s) below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.				<b>Noted</b>

Condition	Requirements	Section																		
L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	Noted																		
L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.	Noted																		
L2.4	<p>Water and/or Land Concentration Limits</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Units of Measure</th> <th>50 percentile concentration limit</th> <th>90 percentile concentration limit</th> <th>3DGM percentile concentration limit</th> <th>100 percentile concentration limit</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>pH</td> <td></td> <td></td> <td></td> <td>6.5-9.5</td> </tr> <tr> <td>Total Suspended Solids</td> <td>Milligrams per litre</td> <td></td> <td></td> <td></td> <td>120</td> </tr> </tbody> </table>	Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM percentile concentration limit	100 percentile concentration limit	pH	pH				6.5-9.5	Total Suspended Solids	Milligrams per litre				120	SWMP and WMPProg
Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM percentile concentration limit	100 percentile concentration limit															
pH	pH				6.5-9.5															
Total Suspended Solids	Milligrams per litre				120															
L3.1	<p>For each discharge point or utilisation area specified below (by a point number), the volume/mass of:</p> <p>a) Liquids discharged to water; or</p> <p>b) Solids or liquids applied to the area</p> <p>Must not exceed the volume/mass limit specified for that discharge point or area.</p> <table border="1"> <thead> <tr> <th>Point</th> <th>Unit of Measure</th> <th>Volume/Mass limit</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>Megalitres per day</td> <td>250</td> </tr> </tbody> </table>	Point	Unit of Measure	Volume/Mass limit	4	Megalitres per day	250	SWMP and WMPProg												
Point	Unit of Measure	Volume/Mass limit																		
4	Megalitres per day	250																		
O2.2	The licensee is responsible for the correct operation of the sewage treatment system on their premises.	SWMP																		
O2.3	Correct operation involves regular supervision and system maintenance. The licensee must be aware of the system management requirements and must ensure that the necessary service contracts are in place.																			
O2.4	The sewage treatment system must be serviced by a suitably qualified and experienced wastewater technician at least once in each quarterly period and a minimum of four times per year.																			
O2.5	The licensee must record each inspection and any actions required or recommended by the technician including all results of tests performed on the sewage treatment system by the technician as required in Condition O2.4.																			
O2.6	<p>The licensee must prepare a sewage treatment system maintenance program. The program must include:</p> <p>a) Certification from the system provider that the sewage treatment system is operating within its capacity;</p> <p>b) Date, time and results of all routine maintenance procedures undertaken to the sewage treatment system; and</p>																			

Condition	Requirements	Section
	c) Provide written records of each quarterly inspection.	
O4.1	Effluent application must not occur in a manner that causes ponding or surface runoff.	<b>SWMP</b>
O4.2	Spray from the effluent application must not drift beyond the boundary of the effluent discharge utilisation area.	
O4.3	The quantity of effluent/solids applied to the utilisation area must not exceed the capacity of the area to effectively utilise the effluent/solids. For the purpose of this condition, 'effectively utilise' include the use of the effluent/solids for pasture or crop production, as well as the ability of the soil to absorb the nutrient, salt, hydraulic load and organic material.	
O4.4	The licensee must ensure that the effluent discharge utilisation area perimeter is fenced and signposted "Effluent Re-Use Area Keep Out" and controlled in a manner to ensure the exclusion of persons from that area.	
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	<b>SWMP and WMPProg</b>
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	
M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	<b>SWMP and WMPProg</b>
M2.3	Water and/ or Land Monitoring Requirements	

Condition	Requirements	Section																																												
	<p><b>POINT 4</b></p> <table border="1" data-bbox="426 367 1150 634"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Conductivity</td> <td>microsiemens per centimetre</td> <td>Continuous during discharge</td> <td>A probe designed to measure the range 0 to 10,000 uS/cm</td> </tr> <tr> <td>pH</td> <td>pH</td> <td>Continuous during discharge</td> <td>In line instrumentation</td> </tr> <tr> <td>Total suspended solids</td> <td>milligrams per litre</td> <td>Daily during any discharge</td> <td>Grab sample</td> </tr> </tbody> </table> <p><b>POINT 9</b></p> <table border="1" data-bbox="426 708 1142 919"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Conductivity</td> <td>microsiemens per centimetre</td> <td>Every 2 months</td> <td>Grab sample</td> </tr> <tr> <td>pH</td> <td>pH</td> <td>Every 2 months</td> <td>Grab sample</td> </tr> <tr> <td>Total suspended solids</td> <td>milligrams per litre</td> <td>Every 2 months</td> <td>Grab sample</td> </tr> </tbody> </table> <p><b>POINT 18</b></p> <table border="1" data-bbox="426 1019 1142 1198"> <thead> <tr> <th>Pollutant</th> <th>Units of measure</th> <th>Frequency</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Faecal Coliforms</td> <td>colony forming units per 100 millilitres</td> <td>Quarterly during discharge</td> <td>Grab sample</td> </tr> <tr> <td>pH</td> <td>pH</td> <td>Quarterly during discharge</td> <td>Grab sample</td> </tr> </tbody> </table>	Pollutant	Units of measure	Frequency	Sampling Method	Conductivity	microsiemens per centimetre	Continuous during discharge	A probe designed to measure the range 0 to 10,000 uS/cm	pH	pH	Continuous during discharge	In line instrumentation	Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample	Pollutant	Units of measure	Frequency	Sampling Method	Conductivity	microsiemens per centimetre	Every 2 months	Grab sample	pH	pH	Every 2 months	Grab sample	Total suspended solids	milligrams per litre	Every 2 months	Grab sample	Pollutant	Units of measure	Frequency	Sampling Method	Faecal Coliforms	colony forming units per 100 millilitres	Quarterly during discharge	Grab sample	pH	pH	Quarterly during discharge	Grab sample	
Pollutant	Units of measure	Frequency	Sampling Method																																											
Conductivity	microsiemens per centimetre	Continuous during discharge	A probe designed to measure the range 0 to 10,000 uS/cm																																											
pH	pH	Continuous during discharge	In line instrumentation																																											
Total suspended solids	milligrams per litre	Daily during any discharge	Grab sample																																											
Pollutant	Units of measure	Frequency	Sampling Method																																											
Conductivity	microsiemens per centimetre	Every 2 months	Grab sample																																											
pH	pH	Every 2 months	Grab sample																																											
Total suspended solids	milligrams per litre	Every 2 months	Grab sample																																											
Pollutant	Units of measure	Frequency	Sampling Method																																											
Faecal Coliforms	colony forming units per 100 millilitres	Quarterly during discharge	Grab sample																																											
pH	pH	Quarterly during discharge	Grab sample																																											
M3.2	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	<b>SWMP and WMProg</b>																																												
M5.1	<b>Recording of pollution complaints</b>	<b>Section 7.0</b>																																												



Condition	Requirements	Section						
	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.							
M5.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.							
M5.3	The record of a complaint must be kept for at least 4 years after the complaint was made.							
M5.4	The record must be produced to any authorised officer of the EPA who asks to see them.							
M6.1	<b>Telephone Complaints Line</b> The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	<b>Section 7.0</b>						
M6.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.							
M7.1	<b>Requirement to monitor volume or mass</b> For each discharge point or utilisation area specified below, the licensee must monitor: a) the volume of liquids discharged to water or applied to the area; b) the mass of solids applied to the area; c) the mass of pollutants emitted to the air; at the frequency and using the method and units of measure, specified below. <b>POINT 4</b> <table border="1" data-bbox="380 1133 1159 1247"> <thead> <tr> <th>Frequency</th> <th>Unit of Measure</th> <th>Sampling Method</th> </tr> </thead> <tbody> <tr> <td>Continuous</td> <td>megalitres per day</td> <td>In line instrumentation</td> </tr> </tbody> </table>	Frequency	Unit of Measure	Sampling Method	Continuous	megalitres per day	In line instrumentation	<b>SWMP and WMPProg</b>
Frequency	Unit of Measure	Sampling Method						
Continuous	megalitres per day	In line instrumentation						
M9.1	<b>HRSTS Monitoring</b> The licensee must continuously operate and maintain communication equipment which makes the conductivity and flow measurements, taken at Point 4 available to the ""Service provider"" within one hour of those measurements being taken and makes them available in							

Condition	Requirements	Section
	the format specified in the ""Hunter River Salinity Trading Scheme Discharge Point Site Equipment"" as published by the Department of Land and Water Conservation on 7 May 2002.	
M9.2	The licensee must ensure that all monitoring data is within a margin of error of 5% for conductivity measurements and 10% for discharge flow measurement.	
M9.3	The licensee must mark monitoring point(s) number 4, with a sign which clearly indicates the name of the licensee, whether the monitoring point is up or down stream of the discharge point(s) and that it is a monitoring point for the Hunter River Salinity Trading Scheme.	
R1.1	<p><b>Annual return documents</b></p> <p>The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:</p> <ol style="list-style-type: none"> <li>1. a Statement of Compliance;</li> <li>2. a Monitoring and Complaints Summary;</li> <li>3. a Statement of Compliance - Licence Conditions;</li> <li>4. a Statement of Compliance - Load Based Fee;</li> <li>5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan;</li> <li>6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and</li> <li>7. a Statement of Compliance - Environmental Management Systems and Practices.</li> </ol> <p>At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.</p>	<b>Section 9.2.2</b>
R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below.	
R1.5	The Annual Return for the reporting period must be supplied to the EPA via eConnect EPA or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	
R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	
R1.7	<p>Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:</p> <ol style="list-style-type: none"> <li>a) the licence holder; or</li> <li>b) by a person approved in writing by the EPA to sign on behalf of the licence holder.</li> </ol>	
R2.1	<p><b>Notification of environmental harm</b></p> <p>Notifications must be made by telephoning the Environment Line service on 131 555.</p>	<b>Section 9.2.4</b>
R2.2	<p>The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.</p> <p>Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.</p>	

Condition	Requirements	Section
R3.1	<p><b>Written Report</b></p> <p>Where an authorised officer of the EPA suspects on reasonable grounds that:</p> <p>a) where this licence applies to premises, an event has occurred at the premises; or</p> <p>b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.</p>	Section 9.2.4
R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.	Noted
R3.3	<p>The request may require a report which includes any or all of the following information:</p> <p>a) the cause, time and duration of the event;</p> <p>b) the type, volume and concentration of every pollutant discharged as a result of the event;</p> <p>c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;</p> <p>d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;</p> <p>e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;</p> <p>f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and</p> <p>g) any other relevant matters.</p>	Section 9.2.4
R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	Noted
R4.1	<p>HRSTS Reporting</p> <p>The licensee must compile a written report of the activities under the Scheme for each scheme year. The scheme year shall run from 1 July to 30 June each year. The written report must be submitted to the EPA' s regional office within 60 days after the end of each scheme year and be in a form and manner approved by the EPA. The information will be used by the EPA to compile an annual scheme report."</p>	Section 9.2.3
R4.3	The sewage treatment system maintenance program required by Condition O2.6 must be submitted annually to the EPA with the Annual Return.	Section 9.2.2
R4.4	The licensee must retain a copy of each report required by Condition O2.5 for 3 years from the date each report is made.	Noted