May 2015

Independent Environmental Audit - Metropolitan Coal

Trevor Brown & Associates
APPLIED ENVIRONMENTAL MANAGEMENT CONSULTANTS

REPORT: MC/REV2/JANUARY2016

Independent Environmental Audit

Metropolitan Coal Project

May 2015

trevor brown & associates

applied environmental management consultants

REPORT: MC/REV3/JANUARY2016

DISTRIBUTION

Copies	Recipient	Copies	Recipient
1	pdf Electronic Copy		

This document was prepared for the sole use of Peabody Energy and Helensburgh Coal Company Pty Ltd, the regulatory agencies that are directly involved in this project, as the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of trevor brown & associates.

by

trevor brown & associates

ABN: 65 850 181 279

42 Skiff Street Vincentia NSW 2540

18 January 2016

Trevor Brown

Principal Environmental Consultant/Auditor

Table of Contents

Executive Summary

The Project Approval granted for the Metropolitan Coal Project on 8 September 2010, requires an Independent Environmental Audit of compliance to satisfy the requirements of Project Approval 08-0149 Schedule 7 condition 8. This Independent Environmental Audit was conducted by Trevor Brown & Associates in May 2015.

The Independent Environmental Audit findings indicate that Metropolitan Coal is generally operating in compliance with Project Approval 08_0149, Environment Protection Licence 767 and Consolidated Mining Lease CML 2, conditions of approval.

The summarised findings of the Independent Environmental Audit conducted in May 2015 are:

Environmental Management Strategy and Environmental Management Plans

The Environmental Management Strategy prepared under Project Approval 08_0149 Schedule 7 condition 1, satisfies the requirements of Project Approval condition and generally addresses the elements of ISO 14001 and provides a sound basis for the environmental management of the project.

Environmental Management Plans

The approved Environmental Management Plans have been developed in compliance with the requirements of Project Approval Schedule 7 condition 2 and the specific Project Approval conditions for the Metropolitan Coal Project mining areas and surrounds and the surface facilities area.

Catchment Monitoring Program

The Catchment Monitoring Program was prepared in accordance with Project Approval 08_0149 Schedule 3 condition 2 and approved by DP&I on 14 November 2011. Revisions of the Catchment Monitoring Program were approved on 29 May 2013 and 25 August 2014. The extensive surface water and groundwater monitoring network implemented by Metropolitan Coal provides a sound program for the assessment of environmental performance of water management in the underground mining area within the Woronora Special Area. The monitoring and assessment of Project impacts on surface water and groundwater resources within the Woronora Special Area, described in the Catchment Monitoring Program, is consistent with the programs described in the Extraction Plan - Water Management Plans. To date no statistically detectable impacts on threatened species, populations or ecological communities have been recorded from the various monitoring programs. It thus appears that Metropolitan Coal has satisfied the requirements of the Project Approval in relation to these matters.

Extraction Plans – Subsidence Assessment

The Extraction Plans for the Metropolitan Coal underground mining have been prepared in accordance with the Environmental Assessment and subsidence predictions are presented in each Extraction Plan and the documents approved prior to commencement of the nominated Long-walls. Based on the review of the of the Project Approval conditions, Extraction Plans, AEMR documents for 2012 to 2014 and End of Panel Reports for long-walls 21 and 22, it is concluded that the Metropolitan Mine has complied with the conditions for mine subsidence impact management for the 2012 to 2014 audit period. The information being collected is considered adequate for meeting the adaptive management objectives of current and future Extraction Plan standards and allows for the review and assessment of necessary mitigation or remediation strategies should environmental impact exceedances occur. Actual subsidence and impact predictions at surface features within the area of influence of mining have generally been less than or consistent with the Environmental Assessment predictions.

Biodiversity

Project Approval Schedule 3 Condition 1, requires that Metropolitan Coal to demonstrate the environmental performance of the project in relation to several specific ecological values. During the period of this audit (August 2011 to December 2014), Metropolitan Coal was operating in a manner compliant with the requirements of Project Approval 08_0149.

Research Programs

The Metropolitan Coal Research Program has been developed in accordance with the requirements of Project Approval 08_0149 Schedule 3 condition 9, and the program approved by DP&I on 27 May 2011. The research programs are continuing with funding and co-operation of Metropolitan Coal.

Noise

The Noise Management Plan was prepared to satisfy Project Approval 08_0149 Schedule 4 condition 8 and approved by DoP on 26 August 2010. The Noise Management Plan was revised to include minor amendments and inclusion of a real-time noise performance monitor on 25 August 2014. The $LA_{eq(15minute)}$ results for the quarterly surveys of September 2012 to December 2014 indicated the long term mine related noise levels at the monitoring locations have been lowered over this period due to works on the CHPP to upgrade the cladding and reduce the area of openings in the façade. The noise survey conducted in March 2015 indicated that noise levels at the monitoring locations were compliant with the noise impact criteria in Project Approval 08_0149 Schedule 4 conditions 1, 2 and 3.

Air

The Air Quality and Greenhouse Gas Management Plan prepared to satisfy Project Approval 08_0149 Schedule 4 condition 13, was approved by DP&I on 14 April 2011 and provides satisfactory procedures and mitigation measures to mage dust generation and dispersion from the Metropolitan Coal surface facilities area activities. The reported dust deposition and PM10 monitoring results between 2012 and 2014 were compliant with the air quality criteria listed in Project Approval Schedule 4 condition 11.

Site Water Balance

A site water balance was developed for the Metropolitan Coal Mine Project as part of the Environmental Assessment (2008) and the water balance model is used as a forward planning tool for the operation of the project. The site water balance is monitored and reviewed annually to optimise water usage and assess performance and validate predictions related to the water management system.

Surface Water

A Surface Facilities Water Management Plan was prepared in consultation with DWE and DECCW to satisfy Project Approval 08_0149 Schedule 4 condition 15, and approved by DoP on 14 April 2011. The water management at the surface facilities area and two ventilation sites has been conducted in accordance with the Surface Facilities Water Management Plan. The review of surface water quality records required to satisfy EPL 767 criteria indicated compliance for all water discharged from the surface facilities area between August 2011 and December 2014.

Groundwater

The information reviewed indicates the impact of the project on the groundwater regime is within the bounds of the impacts predicted by the Environmental Assessment and subsequent updates to the groundwater model. The proponent has developed the management plans required by the Project Approval and is complying with the commitments made within these plans. The management plans require frequent monitoring of groundwater levels/quality, and six monthly verification of the groundwater model. This level of rigour is appropriate given the sensitive nature of the project area. The environmental performance of the project with regards to

groundwater management is considered to be of a very high standard, particularly given the onerous nature of the approval conditions.

Water-Related Data Review

This review of Metropolitan Mine's publically available surface water quality data carried out as part of the audit process and found that, for the analytes of concern at key monitoring sites:

- the raw data and laboratory reports have been accurately transcribed into spreadsheet form;
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 accurately reflects the raw data; and
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 has been appropriately interpreted.

It was noted that there were some discrepancies in the calculation of the baseline mean plus one standard deviation and the baseline mean plus two standard deviations. These discrepancies resulted in the over reporting of some exceedances of water quality data but did not result in any exceedances not being reported.

Erosion and Sediment Control

The management of erosion and sediment control on the Metropolitan Coal surface facilities area and the areas of the Woronora Special Area where potential subsidence impacts may or have occurred, is assessed and managed in accordance with the various Extraction Plans, Water Management Plans, and Biodiversity Management Plans developed for the project. The visual inspections conducted during this audit confirmed that Metropolitan Coal procedures and mitigation measures were satisfactorily managing surface runoff from disturbed areas and controlling loss of sediment to the environment.

Transport

The transport of coal from the Metropolitan Colliery by rail to Port Kembla and by road to local customers (i.e. Corrimal and Coalcliff Coke Works), did not exceed the approved production rate of 3.2 million tonnes in a calendar year, between 2011 and 2015. Road transport of product coal to the Corrimal and Coalcliff Coke Works ceased in 2014 with closure of the coke works. All product coal is currently transported by rail.

Approximately 15% of the ROM coal processed in the CHPP is separated to the coal reject streams. The majority of this coal reject material is transported from the Metropolitan Colliery site by truck to the Glenlee Washery.

Rehabilitation

A Rehabilitation Strategy was developed as a framework document that describes the development rehabilitation objectives and completion criteria for the future land-use of the surface facilities area following the completion of mining activities. A Rehabilitation Management Plan (RMP-R01-E being approved by DTIRIS DRE on 22 May 2014) describes the rehabilitation objectives and performance indicators to be met in accordance with Project Approval 08_0149 Schedule 6 condition 1. Metropolitan Coal is operating in a manner consistent with the Project Approval 08_0149 condition rehabilitation requirements.

Offsets

The monitoring of the areas identified in Project Approval 08_0149 Schedule 6 condition 1 - Table 11 between August 2011 and December 2014 has not indicated the exceedance of any performance measure set by Metropolitan Coal for assessment of the status of each Domain. The remediation measures undertaken by Metropolitan Coal to address the impact identified at Pools A and F on the Waratah Rivulet, are considered to have mitigated the identified impact at Pools A and F, so no offset is currently considered to be required.

Annual Reviews

The Independent Environmental Audit reviewed each Annual Review and verified the reported summary information for each environmental aspect in relation to the operation and activities at the Metropolitan Coal

Project site and documentation. It is concluded that the Annual Reviews are a true and accurate summary of the status of the Metropolitan Coal Project environmental status for each of the reporting periods.

1. Introduction

1.1 Background

The Project Approval for the Metropolitan Colliery Project granted on 8 September 2010 requires an Independent Environmental Audit to be conducted by the end of December 2011. This Independent Environmental Audit was commissioned by Metropolitan Colliery and conducted by Trevor Brown &Associates to satisfy the requirements of Project Approval 08-0149 Schedule 7 condition 8:

> *INDEPENDENT ENVIRONMENTAL AUDIT*
>
> *By end of December 2011, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:*
>
> *(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;*
>
> *(b) include consultation with the relevant agencies;*
>
> *(c) assess the environmental performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);*
>
> *(d) review the adequacy of strategies, plans or programs required under these approvals; and, if appropriate; and*
>
> *(e) recommend measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under these approvals.*

The Independent Environmental Audit site inspections and documentation assessment for compliance with Project Approval 08_0149 and other environmental approvals for the Metropolitan Colliery were carried out in May 2015, by a team of experienced and independent experts endorsed by the by the Secretary of the Department of Planning and Environment on 16 December 2014.

1.2 Scope of Work

The Independent Environmental Audit was conducted generally in accordance with the Australian/New Zealand Standards ISO 19011:2002 – Guidelines for Quality and/or Environmental Systems Auditing. The scope of work for the independent environmental audit of the Metropolitan Colliery operations included the following components:

- review of compliance with Consolidated Project Approval 08_0149 conditions and other approvals for the project;
- conduct of a site inspection and review on-site documentation and monitoring data for the project, relevant to the audit;
- discussion of the development consent and other approval conditions and operation of the project with Metropolitan Colliery Project personnel;
- assessment of environmental performance of the development with the requirements in this Project Approval, Environment Protection Licence and Mining Lease conditions (including any assessments, plans or programs required under these consents/approvals);
- review of the adequacy of strategies, plans or programs prepared under the abovementioned consents/approval;
- provision of recommendations if considered necessary for implementation of measures or actions to improve environmental performance of the development, and/or any assessment, plan or program required under the project approvals; and
- preparation of the Independent Environmental Audit Report providing assessment of compliance against each approval condition and provision of recommendations or actions where considered

appropriate to improve the environmental performance of the development, and/or the environmental management and monitoring systems.

1.3 Structure of the Report

The report has been prepared to provide comment on each condition of approval in a tabulated form, with additional discussion where required on specific matters. The tabulated comments are in the Attachments to this Independent Environmental Audit Report. The Independent Audit Report sections are:

Section 1	Introduction
Section 2	Metropolitan Colliery Mine Development
Section 3	Consents, Approvals and Licenses
Section 4	Metropolitan Colliery Mine Status – November 2011
Section 5	Review of Environmental Management
Section 6	Conclusions and Recommendations
Glossary	
Attachment A	Consolidated Ministers Conditions of Approval (08-0149 dated 2 October 2013)
Attachment B	Environment Protection Licence No. 767
Attachment C	Consolidated Coal Lease 703

1.4 Compliance Table

This audit assessed the activities for compliance with the intent of the Project Approval, Environment Protection Licence and Mining Lease conditions via site inspections, document review and verification of relevant documentation related to the conditions of approval.

The compliance status is expressed in the Attachments to this report as:

Status	Description
Compliant	Adequacy and appropriateness of implementation against the Development Consent and Project Approval Conditions, or compliance with commitment made.
Compliant Ongoing	The intent and specific requirements of the condition have been met and the requirements are ongoing for the operation of Metropolitan Coal.
Non-Compliant	The intent or one or more specific requirements of the condition have not been met and is environmentally significant.
Administrative Non-compliance	A technical non-conformance with a condition of the consent that would not result in material harm to the environment
Not active / Not applicable	Condition or requirement has an activation or requirement that had not been triggered at the time of the review, therefore a determination of compliance could not be made.
Noted	Conditions that are statements of requirement but not auditable.

Any Non-compliance (if identified) will be subject to a risk assessment in accordance with the Draft Guidelines – Independent Environmental Audits of Mining Projects section 7.2 and reported in section 5 Conclusions of this audit report.

2. Metropolitan Coal Project Development

Metropolitan Colliery is an underground coal mining operation located approximately 30 kilometres north of Wollongong NSW. The Metropolitan Colliery is owned and operated by Helensburgh Coal Pty Ltd (HCPL), a wholly owned subsidiary of Peabody Pacific Pty Limited. The Metropolitan Coal Project area generally includes those lands within the Consolidated Coal Lease 703, Mining Lease 1702, and subleased potion of CCL 724 (sub-leased from BHP Billiton Endeavour Coal Pty Ltd).

2.1 Historical Outline of Metropolitan Colliery Development

Metropolitan Colliery was originally developed in the 1880's in Helensburgh (known as 'Camp Creek' a tent town for railway workers constructing the Illawarra Railway line between 1884 and 1888). The construction of the Illawarra Railway was completed in 1888.

Miners camped in the same area, commencing exploration for coal deposits in 1883. Helensburgh grew largely based on the development of the Metropolitan coal mine after commencement of production in 1888. As the newly completed railway line ran adjacent to the Metropolitan Colliery site, once full production began in 1890 a spur line was built into the mine area and coal was transported to Sydney (mainly for use by NSW railways and the Royal Navy).

In 1901 the Metropolitan underground mine area extended over a 4.8 x 1.2 km area, accessed by two circular shafts for haulage and ventilation (the current Shafts 1 and 2). Coal was extracted by bord and pillar methods.

Mechanised bord and pillar methods were introduced in 1951, and a drift replaced downcast shaft No.1 in 1954. A new ventilation shaft (No.3) was sunk in 1975, and the Koepe winder was upgraded in 1985. Mechanised long-wall mining was introduced in 1995, with resulting output of approximately 1.5 million tonnes of coal a year for export.

Metropolitan Coal is currently wholly owned by Peabody Energy Australia Pty Ltd (Peabody).

2.2 Metropolitan Colliery Current Operations

Metropolitan Coal currently produces approximately 1.5 million tonnes per annum (Mtpa) of hard and semi-hard coking coal product.

The economic coal seams (Bulli, Balgownie and Wongawilli Seams) in the Southern Coalfield are located within the Illawarra Coal Measures that comprise a sequence of inter-bedded sandstone, siltstone, claystone and coal with minor tuff, conglomerate and intrusions. The Bulli Seam is the only seam presently considered to be of economic significance at the Metropolitan Colliery. Long-wall mining of the Bulli Seam commenced in 1995 and mining continues with Long-walls 20 to 44 of the underground mining operations in the Bulli Seam to the north of the completed historical underground mining areas.

In accordance with Project Approval schedule 3 Condition 5, Metropolitan Coal has carried out first workings in the mining area consistent with the approved mine plan and secondary extraction of Long-wall 20 – 22 in accordance with the approved mine plan and Extraction Plan.

The Metropolitan Underground Mining Operations currently use conventional long-wall coal mining methods with long-wall panels developed to create a void width of approximately 163 m (including gate roads). Run-of-

Mine (ROM) coal is extracted by the long-wall miner and conveyed to the main conveyor that transports the coal to the surface.

The Major Surface Facilities Area and supporting infrastructure includes administration, workshops, bath houses, ablution facilities, fuel and consumables storages, hardstand areas, haul roads, access roads, Coal Handling and Preparation Plant (CHPP), stockpiles (including ROM coal, product coal and coal reject) and associated coal handling infrastructure (e.g. conveyors, transfer points and buffer bins). Other surface facilities located outside of the existing Metropolitan Colliery Major Surface Facilities Area include an electrical switchyard and fan installations located at Ventilation Shaft No. 3 located to the west of the F6 Freeway.

ROM coal is reclaimed, crushed, screened and washed at the Metropolitan coal handling and preparation plant (CHPP). The CHPP comprises crushers, screens, dense medium cyclones, flotation cells, separators, filters and thickeners to process the coal and separate coal reject materials. Once washed, product coal is conveyed to the product coal stockpiles to the east of the CHPP and adjacent to the rail spur.

The majority of product coal is currently transported by train to the Port Kembla Coal Terminal for distribution to overseas customers.

Approximately 15% of the ROM coal processed in the CHPP is separated to the coal reject streams. Coarse and fine coal reject from the CHPP is stockpiled temporarily on site prior to being transported by road, by an independent transport contractor, to the Glenlee Washery.

Trials have been conducted on coal rejects (coarse reject that is on the stockpile and fines reject that is delivered to the fines bunker) from the CHPP, with processing of the material for underground emplacement which involves pumping processed reject through a discharge pipeline into old disused mine workings through a borehole.

3. Metropolitan Coal Project Status – May 2015

3.1 Surface Facilities Area

The surface facilities area is contained within a steep sided valley. All the major surface facilities associated with the handling of Run-of-Mine (ROM) coal, Coal Handling and Preparation Plant (CHPP), coal stockpiles, rail loading facilities, administration, workshop and store, bath house and surface water management system components are within this area.

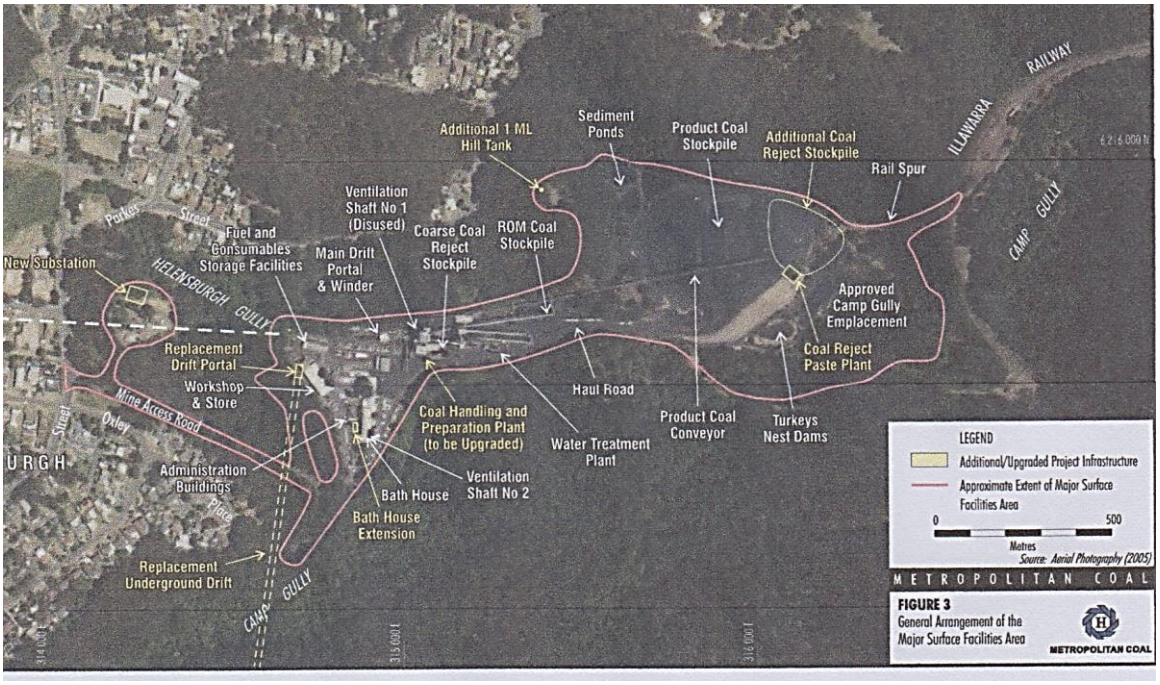


Figure 4.1: Metropolitan Coal Surface Facilities Area - Layout

Modernisation of surface facilities has occurred progressively to older structures on the surface facilities area. The Coal Handling and Preparation Plant (CHPP) and associated material handling systems are being upgraded to increase CHPP throughput, including:

- the integration of new equipment to increase the washing capacity;
- new cladding on the washery structure with insulation to reduce noise;
- Enclosure of conveyors from the washery to the stockpile area;
- construction of trenching for the power supply to the new winder;

Plate 4.1a: New cladding on the washery structure

Figure 4.1b: Enclosed of conveyors on the washery

A new drift winder (that replaced the previous winder installed in 1954) to transport materials to and from the underground area was transported to the site in November 2014. The new drift winder will be commissioned for operational use during 2015.

3.2 Underground Mining

Long-wall underground mining at the Metropolitan Coal Project between August 2011 and May 2015 occurred in long-walls 20-22 between August 2011 and April 2014. Mining of Long-wall 23 commenced in April 2014 and Long-wall 24 was active at the date of this audit (May 2015).

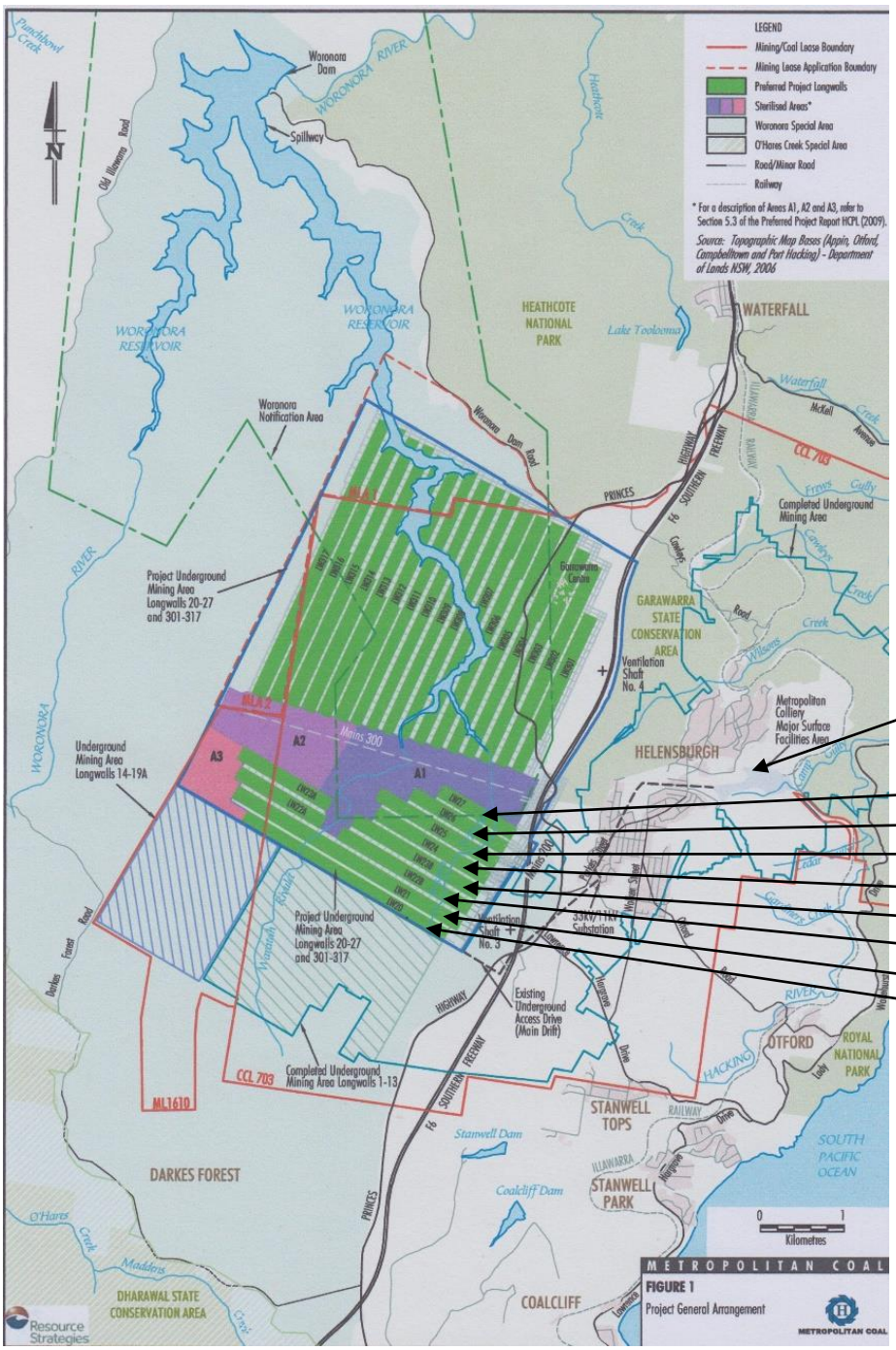


Figure 2.1: Metropolitan Coal Underground Mining Area and Surface Facilities Location.

Metropolitan Coal has carried out first workings and subsequent secondary workings, consistent with the approved Mine Operations Plans.

Metropolitan Coal completed the secondary extraction coal from Long-walls 20-22 during 2010 to April 2014. Secondary extraction of Longwall 23A commenced in May 2014 and was completed in September 2014. Longwall 23B extraction commenced in September 2014 and was completed in March 2015. Coal extraction from Long-wall 24 had commenced at the date of this audit (May 2015).

4. Consents, Approvals and Licenses

4.1 Development Consents and Project Approvals

Metropolitan Colliery began extracting coal by underground methods in the 1880s. Long-wall mining began in the mid-1990s.

Metropolitan Colliery and most other coal mines in the Southern Coalfield operated without development consent as the passage of the *Environmental Protection and Assessment Act 1979 (EP&A* Act) was accompanied by model transitional provisions, which meant that existing coal mines did not need to obtain development consent, provided that those provisions were adopted in the relevant LEP. Provisions adopted in the Wollongong LEP meant that Metropolitan was then able to continue to operate without development consent.

When Part 3A of the *Environmental Protection and Assessment Act 1979* was passed in August 2005 it included amendments to the *Mining Act 1992* that removed an exemption under section 74(1) of the *Mining Act*, for existing mines operating under a mining lease.

With the implementation of the Major Projects SEPP and the amendments to the *Mining Act*, all existing underground coal mines operating in NSW, including Metropolitan Colliery, were required to obtain a Project Approval from the Minister for Planning under Part 3A of the EP&A Act by 16 December 2010.

4.1 Project Approval

Project Approval 08_0149 under *Environmental Protection and Assessment Act 1979* Part 3A for the Metropolitan Coal Project was granted under by the Minister for Planning on 22 June 2009.

In June 2010, Metropolitan Coal submitted the *Metropolitan Mine Replacement Drift Construction Modification Environmental Assessment* under Section 75W of the *Environmental Protection and Assessment Act 1979* to modify the Project to allow for the additional construction of a replacement underground drift, including construction of a new drift portal at the mine's Major Surface Facilities Area. The Modification to the Project Approval was granted on 8 September 2010.

On 2 July 2011 a Notice of Modification under 75W of the EP&A Act was granted to allow road transport of coal to Coalcliff Coke Works (the Coalcliff Coke Works closed in 2012) and Corrimal Coke Works (closed in 2014). Road transport of coal ceased under this Modification (MOD 2) in 2014.

Modification (MOD 3) was issued on 2 October 2013 with minor editorial changes in Schedule 2 of the Project Approval.

A summary of compliance with the Project Approval 08_0149 conditions is provided in Attachment A.

4.2 Extraction Plan Approval

Approval of Extraction Plan for Long-walls 23-27 was granted on 9 April 2014 and included additional conditions for the activities and operations associated with Long-walls 23-27. The development is to be undertaken generally in accordance with conditions of Project Approval 08_0149, the Extraction Plan and conditions of this approval.

A summary of compliance with the Project Approval 08_0149 conditions is provided in Attachment B.

4.3 Environment Protection Licence

Environment Protection Licence No. 767 was issued to Illawarra Coal for the Metropolitan Colliery project on 9 October 2001 under the *Protection of the Environment Operations Act 1997*, section 55

Recent Variations to the EPL have included:

Date of Variation	Variation No.	EPL 767 Variation Components
21 November 2014	1526235	The following variations have been made to the licence: condition P1.1: the location description of point 11 has been changed from 55 to 59 Parkes Street.
11 December 2013	1515088	The purpose of notice is to update monitoring points on the EPL to reflect the monitoring network contained in the Air Management Plan.
11 September 2012	1508753	The EPL fee based activity scale for Coal Works (Handled) and Mining for Coal (Produced) were increased to the next highest band-with levels.
19 December 2011	1502957	This notice amended EPL 767 to include a Pollution Reduction Program on the licence that requires a four step assessment process: • estimate baseline emissions and determine the four mining activities that currently generate the most particulate matter; • estimate the reduction in emissions that could be achieved by applying best practice measures; • assess the practicability of each of these measures; and • propose a timetable for the implementation of any practical measures
1 November 2011	1501798	The EPA recently updated the computer software used for the administration of its Environment Protection Licences and Notices and this Variation included those changes.

A summary of compliance with the EPL 767 conditions is provided in Attachment C.

4.4 Mining Leases

Metropolitan Coal's activities are also undertaken in accordance with the conditions of mining leases issued by the NSW Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) – Division of Resources and Energy (DRE) under the NSW Mining Act, 1992 (e.g. CCL 703, ML 1610 and ML 1702) and associated SMP approvals (e.g. Metropolitan Colliery SMP Approval Conditions LW14-17 [DPI-MR, 2006a] and Subsidence Management Plan Approval Metropolitan LW18-19A [DPI-MR, 2008]).

In accordance with the mining lease conditions, Metropolitan Coal has prepared the Metropolitan Coal Mining Operations Plan, 2012 – 2019 (herein referred to as the Metropolitan Coal MOP) (Metropolitan Coal, 2012a). Supplementary approvals have been obtained from the Sydney Catchment Authority (SCA) for surface activities within the Woronora Special Area in accordance with the requirements of mining lease conditions (e.g. previous stream remediation activities at Waratah Rivulet Pool A).

A summary of compliance with the Mining Lease environmental management conditions is provided in Attachment D.

5. Review of Environmental Management

5.1.1 Environmental Management

5.1.1 Environmental Management Strategy

[Project Approval Schedule 7 condition 1]

The Environmental Management Strategy prepared for Metropolitan Colliery addresses the requirements of Project Approval Schedule 7 condition 1 and has been implemented for the project. The Metropolitan Colliery operations are conducted in accordance with the approved Environmental Management Strategy and address the elements of ISO 14001 with:

- an overall framework for environmental management of the Metropolitan project activities;
- identification of key environmental aspects and supporting plans and procedures;
- a framework for review of the EMS and plans for continual improvement; and
- process for reviewing the implementing the EMS and corrective action If required.

Table 5.1 Environmental Management Strategy vs AS/NZS ISO14001 Elements

ISO 14001 Element	Environmental Management Strategy section
4.2 Environmental Policy	Peabody Environmental Responsibility and Policy 2014
4.3.1 Environmental Aspects	Section 4 Project Description
4.3.2 Legal and Other Requirements	Section 3 Statutory Requirements
4.3.3 Objectives and Targets	Environmental Responsibility and Objectives (Peabody)
4.3.4 Environmental Management Programs	Section 7 Table 2 Environmental Management Plans and Monitoring Programs
4.4.1 Structure and Responsibility	Section 5 Site Environmental Management Structure
4.4.2 Training Awareness and Competence	Section 7.2 Environmental Awareness Training
4.4.3 Communication	Section 6 Information Dissemination, Complaints Management and Dispute Resolution
4.4.7 Emergency Preparedness and Response	Section 9 Emergency Response
4.5.1 Monitoring and Measurement	Attachment 1 Environmental Monitoring Locations
4.5.2 Non-conformance, Corrective and Preventative Action	Section 8 Response to Non-Compliance

5.1.2 Conclusion

The Environmental Management Strategy prepared under Project Approval 08_0149 Schedule 7 condition 1, satisfies the requirements of Project Approval condition and generally addresses the elements of ISO 14001 and provides a sound basis for the environmental management of the project.

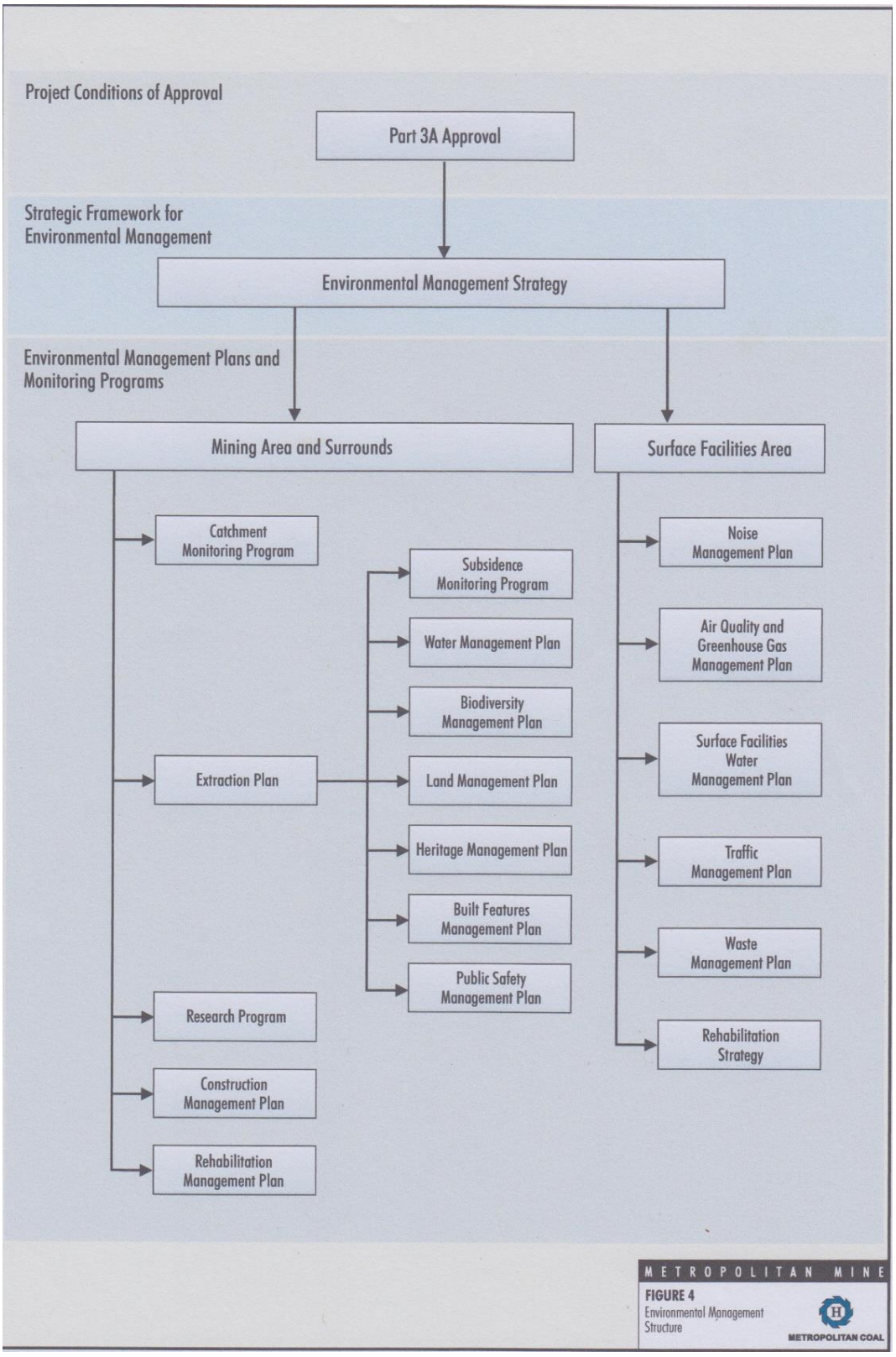
5.2 Environmental Management Plans

[Project Approval 08_0149 Schedule 7 condition 2]

The Environmental Management Plans for the Metropolitan Coal Project have been prepared to satisfy the requirements of Project Approval 08_0149 Schedule 7 condition 2, and the specific environmental aspect management plan requirements described in Schedules 3 and 4.

The Environmental Management Plans have been developed and approved by DP&E in compliance with the requirements of the specific conditions for the Metropolitan Coal Project mining areas and surrounds and the surface facilities area.

The relationship of the Metropolitan Coal Environmental Management Strategy and to the Environmental Management Plans prepared for the Metropolitan Coal is shown on Figure 5.2.



The management plans required to be developed for the Metropolitan Coal Project to satisfy Project Approval 08_0149 are:

Project Approval	Management Plan
Schedule 3, condition 6	Extraction Plan
Schedule 3, condition 6(f)	Water Management Plan (WMP)
Schedule 3, condition 6(f)	Biodiversity Management Plan (BMP)
Schedule 3, condition 6(f)	Land Management Plan (LMP)
Schedule 3, condition 6(f)	Heritage Management Plan (HMP)
Schedule 3, condition 6(f)	Built Features Management Plan (BFMP)
Schedule3 condition 6(g)	Public Safety Management Plan (PSMP)
Schedule 3 condition 11	Construction Management Plan (CMP)
Schedule 4 condition 8	Noise Management Plan (NMP)
Schedule 4 condition 13	Air Quality and Greenhouse Gas Management Plan (AQGGMP)
Schedule 4 condition 15	Surface Facilities Water Management Plan (SFWMP)
Schedule 4 condition 22	Transport Management Plan (TMP)
Schedule 6 condition 4	Rehabilitation Management Plan (RMP)

The environmental management plans for the Metropolitan Coal Project have been prepared generally in accordance with Project Approval 08_0149 Schedule 7 condition 2. Table 4.2 provides a summary of the management plan sections addressing Project Approval 08_0149 Schedule 7 condition 2 components.

Table 5.2: Summary of the Management Plan sections addressing Schedule 7 condition 2 elements.

Project Approval 08_0149 Schedule 7 condition 2	Management Plans (section reference)
(a) detailed baseline data	EP – sub-plan sections below • WMP – section 6 • BMP – section 6 • LMP – section 6 • HMP – section 7 • BFMP – section 6 • PSMP – section 4 CMP – section 5 NMP – section 6 AQGGMP – section 5 SFWMP – section 5 TMP – section 5 RMP – section 6
(b) description of: (i) statutory requirements (including approvals, licence or lease conditions)	EP – section 1.1.1 and Attachment 1 • WMP – section 3 • BMP – section 3 • LMP – section 3 • HMP – section 3 • BFMP – section 3 • PSMP – section 3 CMP – section 3 NMP – section 3 AQGGMP – section 3 SFWMP – section 3 TMP – section 3 RMP – section 3
(ii) limits or performance measures/criteria	EP – section 3 and sub-plan sections below • WMP – section 5 • BMP – section 5 • LMP – section 5 • HMP – section 6

	• BFMP – section 5 • PSMP – section 5 CMP – section 7 NMP – section 5 AQGGMP – section 4 SFWMP – section 6 TMP – section 7 RMP – section 5
(iii) specific performance indicators	EP – section 3 sub-plan sections below • WMP – section 5 • BMP – section 5 • LMP – section 5 • HMP – section 6 • BFMP – section 5 • PSMP – section 5 CMP – section 7 NMP – section 5.2 AQGGMP – section 4 SFWMP – section 6 TMP – section 7 RMP – section 5
(c) measures to be implemented to comply with the statutory limits, or performance measures /criteria	EP – section 3 and specific sub-plan sections below • WMP – section 8 • BMP – section 8 • LMP – section 8 • HMP – section 10 • BFMP – section 8 • PSMP – section 7 CMP – section 6 NMP – section 8 AQGGMP – section 9 SFWMP – section 8 TMP – section 8.3 RMP – section 7
(d) program to monitor and report (i) impacts and environmental performance; (ii) effectiveness of management measures	EP – section 3 and specific sub-plan sections below • WMP – section 7 and 13 • BMP – section 7 • LMP – section 7 • HMP – section 9 • BFMP – section 7 • PSMP – section 6 CMP – section 8 and 11 NMP – section 7 and 11 AQGGMP – section 6 and 12 SFWMP – section 7 and 11 TMP – section 9 and 12 RMP – section 8
(e) contingency plan	EP – section 4.2 and specific sub-plan sections below • WMP – section 9 and 10 • BMP – section 9 and 10 • LMP – section 9 and 10 • HMP – section 11 and 12 • BFMP – section 9 and 10 • PSMP – section 8 CMP – section 9

	NMP – section 9 AQGGMP – section 10 SFWMP – section 9 TMP – section 10 RMP – section 9
(f) program to investigate and implement ways to improve environmental performance of the project over time	EP – section 4.1 and sub-plan sections below • WMP – section 12 • BMP – section 12 • LMP – section 12 • HMP – section 14 • BFMP – section 12 NMP – section 7.2 AQGGMP – section 11 SFWMP – section 10 TMP – section 8 RMP – section 10
(g) protocol for managing and reporting any: (i) incidents; and	EP –section 4.3.1 and sub-plan sections below • WMP – section 13.1 • BMP – section 13 • LMP – section 13 • HMP – section 15 • BFMP – section 13 • PSMP – section 9.1 CMP – section 11.1 NMP – section 11.1 AQGGMP – section 12.1 SFWMP – section 11.1 TMP – section 12.1 RMP – section 11
(ii) complaints;	EP – section 4.3.4 and sub-plan sections below • WMP – section 13.2 • BMP – section 14 • LMP – section 14 • HMP – section 16 • BFMP – section 14 • PSMP – section 9.2 CMP – section 11.2 NMP – section 11.2 AQGGMP – section 12.2 SFWMP – section 11.2 TMP – section 12.2 RMP – section 12
(iii) non-compliances with statutory requirements;	EP –sub-plan sections below • WMP – section 13.3 • BMP – section 15 • LMP – section 15 • HMP – section 17 • BFMP – section 15 • PSMP – section 9.3 CMP – section 11.3 NMP – section 11.3 AQGGMP – section 12.3 SFWMP – section 11.3 TMP – section 12.3 RMP – section 12

(iv) exceedances of the impact assessment criteria and/or performance criteria;	EP – section 4.1 and sub-plan sections below • WMP – section 13.3 • BMP – section 15 • LMP – section 15 • HMP – section 17 • BFMP – section 15 • PSMP – section 9.3 CMP – section 11.3 NMP – section 11.3 AQGGMP – section 12.3 SFWMP – section 11.3 TMP – section 12.3 RMP – section 13
(h) a protocol for periodic review of the plan	EP – section 4.4 and 4.6 • WMP – section 12 • BMP – section 12 • LMP – section 12 • HMP – section 14 • BFMP – section 12 • PSMP – section 2 CMP – section 10 NMP – section 10 AQGGMP – section 11 SFWMP – section 10 TMP – section 11 RMP – section 10

5.2.1 Conclusion

The Environmental Management Plans have been developed in compliance with the requirements of Project Approval Schedule 7 condition 2 and the specific Project Approval conditions for the Metropolitan Coal Project mining areas and surrounds and the surface facilities area.

5.3 Catchment Management[1]

[Project Approval 08_0149 Schedule 3 condition 2]

The Metropolitan Coal Project Underground Mining Area is situated on the Woronora Plateau within the Woronora Reservoir and Hacking River catchments.

A large portion of the Project Underground Mining Area is located within the Dams Safety Committee Notification Area for the Woronora Reservoir in the Woronora Special Area, (approximately 75 square kilometres). The Woronora River (a tributary of the Woronora Reservoir) is situated to the west of the Underground Mining Area and is presently unaffected by long-wall mining activities.

The Underground Mining Area includes the Waratah Rivulet catchment and tributaries that flow directly to the Woronora Reservoir, as well as the upper reaches of the Woronora Reservoir. The headwaters of Cawleys Creek and Wilsons Creek, which drain in an easterly direction away from Woronora Reservoir into the Hacking River are also situated within the north-eastern corner of the Underground Mining Area.

[1] Dr Steve Perrens, Advisian

5.3.1 Performance Measures

[Project Approval 08_0149 Schedule 3 condition 1]

Project Approval 08_0149 Schedule 3 condition 1 requires that Metropolitan Coal does not cause any exceedances of the following performance measures:

Water Resources	Performance Measures
Catchment Yield to the Woronora Reservoir	Negligible reduction to the quality or quantity of water resources reaching the Woronora Reservoir. No connective cracking between the surface and the mine.
Woronora Reservoir	Negligible leakage from the Woronora Reservoir, and negligible reduction in the water quality of Woronora Reservoir
Water Courses	
Waratah Rivulet between full supply level of Woronora Reservoir and the main-gate of Long-wall 23 upstream of Pool P).	Negligible environmental consequences (that is, no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining, and minimal gas releases)
Eastern Tributary between full supply level of Woronora Reservoir and the main-gate of Long-wall 26.	Negligible environmental consequences over at least 70% of the stream length (that is no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining and minimal gas releases).
Biodiversity	
Threatened species, populations, or ecological communities	Negligible impact
Swamps 76, 77 & 92	Sett through condition 4 below.
Land	
Cliffs	Less than 3% of the total length of cliffs (and associated overhangs within the mining area) experience mining-induced rock fall.
Heritage	
Aboriginal Heritage Sites	Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.
Items of historical or heritage significance at the Garrawarra Centre	Negligible damage (that is fine or hairline cracks that do not require repair), unless the owner of the item and the appropriate heritage authority agree otherwise in writing
Built Features	
Built Features	Safe, serviceable and repairable, unless the owner agrees otherwise in writing.

5.3.2 Catchment Monitoring Program

[Project Approval 08_0149 Schedule 3 condition 2]

A Catchment Monitoring Program prepared by Gilbert and Associates, Heritage Computing and Metropolitan Coal (experts endorsed by DP&I on 19 February 2010), in consultation with NSW Office of Water, Sydney Catchment Authority (SCA now Water NSW) and DECCW (OEH/EPA), satisfied the requirements of Project Approval 08_0149 Schedule 3 condition 2. The Catchment Monitoring Program was approved by Planning NSW on 14 May 2010. Amendments to the Catchment Monitoring Program occurred on 14 November 2011, 29 May 2013 and 25 August 2014 and the amended CMP's submitted to DoP/DP&I/DP&E.

As a component of the Catchment Monitoring Program, Metropolitan Coal established a number of new surface water and groundwater monitoring sites to supplement existing baseline data.

The Catchment Monitoring Program includes baseline data of existing surface water and groundwater resources, a program for the ongoing development and use of appropriate surface water and groundwater models, a

program to monitor and assess impacts on surface water and groundwater resources, and a program to validate and calibrate the surface water and groundwater models.

The Extraction Plan Long-walls 20-22 Water Management Plan (Metropolitan Coal, 2013), and Extraction Plan for Long-walls 23-27 Water Management Plan (Metropolitan Coal, April 2014) were implemented to manage the potential environmental consequences of the coal extraction on aquifers, watercourses (including the Woronora Reservoir), and catchment yield.

The Waratah Rivulet catchment and tributaries that flow directly to the Woronora Reservoir, as well as the upper reaches of the Woronora Reservoir and streams occurring within 600 m of Long-walls 20-27 secondary extraction underground mining areas include the Waratah Rivulet and its tributaries (such as Tributaries A and B) and the Eastern Tributary and its tributaries.

A three-dimensional numerical model of groundwater flow has been developed for the mine and its surroundings. The conceptual model developed of the hydrogeological regime supports three distinct groundwater systems – a perched groundwater system, a shallow groundwater system and a deep groundwater system.

The expanded partially-recalibrated model was used to revise the predictions of potential environmental consequences of Long-walls 23-27 extraction on aquifers and base-flow to watercourses for the Metropolitan Coal Extraction Plan Long-walls 23-27 Water Management Plan (2014). Potential environmental consequences have been predicted using two groundwater model variants, termed the “high-inflow” model and the “low-inflow” model that provide upper and lower bound predictions of impacts and mine inflow that can be used to assess performance.

Metropolitan Coal has an extensive surface water and groundwater monitoring network. The environmental performance of water management in the underground mining area is assessed reported in the Annual Review/AEMR’s sections 3.1 and 3.3.

5.3.3 Environmental Assessment Predictions

The initial assessment of the environmental effects of the Metropolitan Coal Project proposed long-wall extraction was revised as a result of project changes reported in the Preferred Project Report (2009).

The Preferred Project Layout reduced the extent of long-wall mining along Waratah Rivulet and the Eastern Tributary when compared to that proposed for the original environmental assessment. The objective of the Preferred Project Layout was the avoidance of the drainage of pools along the majority of the lower reach of the Waratah Rivulet (from Long-wall 24 to the full supply level of Woronora Reservoir).

Revised impacts along Waratah Rivulet, Eastern Tributary and Tributaries A and B due to mining of Long-walls 23 to 27 were made by MSEC (2013).

The stand-offs incorporated into the Preferred Project Layout reduce the cumulative predicted valley closure to less than 200 mm downstream of Pool O4 remain below 200 mm over the remaining reach of the Waratah Rivulet to the full supply level of the Woronora Reservoir (MSEC, 2013). MSEC have concluded that there is a low likelihood of significant fracturing leading to significant loss of surface water through sub-surface diversion downstream of Pool O4.

Based on the available empirical data it was expected that some pools in this reach of the Eastern Tributary will be affected by up-sidence induced subsurface fracturing, leading to underflow and loss of pool water holding capacity.
The predicted total closure profile for Tributary A is generally at or below the empirical impact trigger and it is therefore considered unlikely (i.e. less than 10%) that there would be any significant fracturing leading to significant loss of water holding capacity in the Pools in Tributary A.

The predicted total closure profile for Tributary B due to mining up to the end of Long-wall 27 varies between about 100mm and 720mm. Based on the empirical data presented by MSEC it is expected this could result in loss of water holding capacity in 30 to 80% of the small rock-bar pools which exist along this Tributary.

The Environmental Assessment (2008) Appendix B – Hydrogeological Assessment provided the following conclusions based on the three-dimensional numerical model of the conceptual groundwater system based on piezometer measurements indicated that was expected to be:

- no dewatering of swamps from depressurisation at depth; and
- no loss of groundwater yield to the Woronora Reservoir.

5.3.4 Environmental Assessment Commitments

The Environmental Assessment Statement of Commitments related to the catchment management, mitigation measures and monitoring, was for Metropolitan Coal to consider catchment residual impact offset(s), a financial contribution towards rehabilitation and revegetation works within the Woronora catchment and/or other Sydney Catchment Authority controlled catchments including project management services as required.

The Environmental Assessment (2008) provided the following commitment related to surface water monitoring:

Environmental Assessment (2008) Commitments	Action / Comments
Surface water monitoring will be conducted to assess localised impacts of the Metropolitan Colliery Project on surface water resources:	
The frequency, parameters and locations monitored as part of the surface water quality monitoring program will be described in the Project EMP:	The Catchment Monitoring Program describes the frequency, parameters and locations monitored as part of the surface water quality monitoring program.
• the existing pluviometer (rainfall measurement) network will be maintained over the life of the Project;	Pluviometers were installed in the Honeysuckle Creek catchment (site PV5), Waratah Rivulet catchment (site PV6) and the Eastern Tributary catchment (site PV7) in June 2010.
• an evaporation pan will be re-established at or near the Woronora Reservoir;	Pan evaporation equipment was installed at the pluviometer situated in the Waratah Rivulet catchment (site PV1) in August 2010.
• stream flow gauging stations on Waratah Rivulet, Woronora River and O'Hares Creek will be maintained over the life of the Project;	The SCA gauging stations Waratah Rivulet (GS2132102) and Woronora River (GS2132101) and the OEH gauging stations on O'Hares Creek have been retained.
• the existing water quality monitoring regime on Waratah Rivulet will continue and will be supplemented by on-going monitoring in the Eastern Tributary, Woronora River, Honeysuckle Creek and Bee Creek;	Water quality monitoring on Waratah Rivulet, Eastern Tributary, Woronora River, Honeysuckle Creek and Bee Creek are part of the ongoing surface water quality monitoring regime.

Environmental Assessment (2008) Commitments	Action / Comments
• water quality sampling in Woronora Reservoir will continue;	Water quality sampling of resource reaching the Woronora Reservoir in accordance with the Water Management Pan.
• water level monitoring of major pools on Waratah Rivulet will continue;	Water level monitoring of pools on Waratah Rivulet between Flat Rock Swamp and the full supply level of the Woronora Reservoir has been conducted
• water levels in two representative pools on Woronora River and in selected pools that occur in the lower reaches of the Eastern Tributary will be monitored using continuous water level monitoring devices; and	Water levels in a number of pools on the Waratah Rivulet, Eastern Tributary, Tributary B and Woronora River have been either manually monitored on a daily basis or monitored using a continuous water level sensor and logger
• storage characteristics (volume versus level) and flow levels of all monitored pools will be determined by survey.	Storage characteristics have been monitored and surveyed water levels and flow levels have been measured to assess cease to overflow levels in all pools.

The commitments made in the Environmental Assessment (2008) in relation to surface water monitoring have all been implemented.

5.3.5 Commitments in Catchment Monitoring Program

The Catchment Monitoring Program commits to continually refining the catchment runoff models and groundwater model as new data becomes available. Numerical catchment runoff models were developed using the Australian Water Balance Model (AWBM) (Boughton, 2004) and calibrated for the Waratah Rivulet gauging station (GS2132102) and the O'Hares Creek gauging station at Wedderburn (GS213200). The models are progressively updated using the latest monitoring data, and verification checks are conducted. A preliminary calibration of the AWBM has also been undertaken for the gauging station on Woronora River (GS2132101).

The commitments in the Catchment Monitoring Program (which do not indicate a time frame for completion) include:

- developing a local area model for transient calibration of swamp characteristics;
- calibrating the model with shallow time-series groundwater levels, and heads measured in deeper multi-piezometer bores;
- refining the model mesh to match the scale of chain pillars in the mining area; and
- representing near-surface tensile cracking and upland swamps.

A significant and good quality environmental dataset has now been collected and Metropolitan Coal is planning a more rigorous transient calibration of the groundwater model using data from the shallow and deep groundwater systems during 2015.

Verifying the model every six months occurs as groundwater models require continuous improvement as new data is obtained. The approach to the modelling has been relatively simple, with complexity building as more data from bores becomes available. This approach has Metropolitan Coal is planning predicted the response of the groundwater regime to mining successfully, and mine water make and depressurisation estimates have been within ranges predicted by the groundwater model.

The research project (refer to Project Approval 08_0149 Schedule 3 condition 9) which will use groundwater modelling to investigate the role of chain pillars in retarding depressurisation is also proposed for the 2015 report period. There is no timeline for this work in the documentation, but it will be of benefit before the preparation of the next Extraction Plan and should be progressed.

Recommendation:
It is recommended that the Research Program Significance of Chain Pillars on Simulated Groundwater Pressures Project Approval 08_0149 Schedule 3 condition 9 be progressed before the preparation of the next Extraction Plan

5.3.4 Catchment Monitoring Program - Surface Water Monitoring

5.3.4.1 Surface Water Flow

Continuous surface water flow monitoring occurs at the following gauging stations:

- Metropolitan Coal-owned gauging station on the Eastern Tributary, close to the inundation limits of the Woronora Reservoir;
- SCA-owned gauging station on the Waratah Rivulet, close to the inundation limits of the Woronora Reservoir (GS2132102);
- SCA-owned gauging station on the Woronora River, close to the inundation limits of the Woronora Reservoir (GS2132101) (control site);
- Metropolitan Coal-owned gauging station on Honeysuckle Creek (control site); and
- OEH gauging station on O'Hares Creek at Wedderburn (GS213200) (control site).

Data from the gauging stations is downloaded monthly by the SCA and provided to Metropolitan Coal in accordance with a data exchange agreement.

At the Waratah Rivulet gauging station (Pool Q), a subsidence survey line has been established to monitor conventional and non-conventional subsidence magnitudes at this location. If monitoring identifies subsidence effects at this location, a review of the hydrological performance of the gauging station including analysis of the rating curve. If this analysis shows the hydrological performance of the gauging station has been compromised and cannot be rectified, an additional gauging station will be installed at an appropriate location further downstream.

Metropolitan Coal will continue to source flow data for the O'Hares Creek gauging station at Wedderburn from the OEH.

5.3.4.2 Surface Water Quality

The monitoring of surface water resources in accordance with the Extraction Plan Water Management Plans for Long-walls 20-22 and Long-walls 23-27, have been conducted in accordance with the plans to address the requirements of the objectives in Project Approval Schedule 3 condition 1. (The results are summarised and assessed in the Annual Reviews in section 3):

Water Resources – Catchment Yield to the Woronora Reservoir
*Negligible reduction to the **quantity of water resources** reaching the Woronora Reservoir.*

- **Data Analysis to Assess against Performance Indicators:**
  - 2012 and 2013: Analysis was undertaken in accordance with the long-walls 20-22 Water Management Plan.
  - 2014: It was noted in the Annual Review 2014 that the assessment of quantity of water resources reaching the Woronora River used a 1 year sliding mean rather than 1 year sliding median. Review by Gilbert & Associates indicated that there are some discrepancies in flows generated using the SCA current rating curves. Re-calibrated catchment models will be developed for the gauging stations in 2014-2015. Additionally, as described in the Metropolitan Coal Catchment Monitoring Program, catchment models will be developed for the Eastern Tributary and Honeysuckle Creek gauging stations once a suitable period of data has been collected.
- **Assessment of performance indicator/s:**
  - Performance indicator/s were not exceeded between 2011 and 2014.

Negligible reduction to the quality of water resources reaching the Woronora Reservoir.

- **Monitoring of Environmental Consequences** was undertaken in accordance with the Extraction Plan Water Management Plans:
  - AR2012, Section 3.3.2, pp 42-45.
  - AR2013, Section 3.3.2, pp 61-64.
  - AR2014, Section 3.3.2.4, pp 59-60, 68-69; Section 3.3.3.4, pp 68-69; Charts 33-38, pp 90-92; and Charts 63-66, pp 119-120).
- **Data Analysis to Assess against Performance Indicators:**
  - The assessment of the performance indicators was undertaken in accordance with the Extraction Plan Water Management Plans
- **Assessment of performance indicator/s:**
  - 2011 to 2013: long-walls 20-22 Water Management Plan (site WRWQ9): The performance indicator was exceeded at site WRWQ9 with the sliding 12 month means for dissolved aluminium, dissolved iron and dissolved manganese exceeding the baseline mean by plus one standard deviation during the review period.
  - 2014: long-walls 20-22 Water Management Plan (sites ETWQ2 and WRWQ9): The performance indicator was exceeded with the sliding 12 month means for dissolved iron and dissolved manganese at site WRWQ9, and the sliding12 month mean for dissolved manganese at site ETWQ2 exceeded the baseline mean plus one standard deviation during the review period.
  - 2014: long-walls 23-27 Water Management Plan: The performance indicators were not exceeded in 2014.
- **Assessment of performance measure:**
  - 2011 to 2014: Assessment of performance measures undertaken in accordance with long-walls 20-22 and long-walls 23-27 Water Management Plans concluded that the performance measure was not exceeded.

    Metropolitan Coal also commissioned an independent review of the performance indicator exceedance, as required by the long-walls 20-22 Water Management Plan (Table 20). The peer review concluded that the performance measure was not exceeded.

Negligible reduction in the water quality of Woronora Reservoir

- **Monitoring of Environmental Consequences** by Metropolitan Coal was undertaken in accordance with the EP WMPs:
- **Data Analysis to Assess against Performance Indicators** was undertaken in accordance with the EP WMPs:
  - **Assessment of performance indicator/s:**
  - 2012: The performance indicator was exceeded - the 12 month moving average total manganese concentration exceeded the baseline mean plus 1 standard deviation criterion (there was not a similar exceedance at the control site in the Nepean Reservoir).
  - 2012 to 2014: The performance indicator was not exceeded during this reporting period.
- **Assessment of performance measure:**
  - 2011 to 2014: an independent review of the performance indicator and assessment of performance measure was undertaken in accordance with the long-walls 20-22 Water Management Plan and concluded that the performance measure was not exceeded.

Negligible environmental consequences (that is, no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining and minimal gas releases) for the Waratah Rivulet between the full supply level of the Woronora Reservoir and the main-gate of Long-wall 23 (upstream of Pool P).

- **Monitoring of Environmental Consequences and Data Analysis to Assess against Performance Indicators** :
  - 2012: Monitoring was not undertaken during 2011-2012, as mining had not advanced to within 400 m of Pool P, and subsidence at Pool P was not greater than 20mm/month.

    2013 to 2014: Monitoring in accordance with the EP WMPs indicated subsidence at Pool P was not greater than 20 mm/month during the reporting period. Opportunistic visual observations were also conducted by Metropolitan Coal during this period.
- **Assessment of performance indicator/s and performance measures:**

- 2011: Assessment of performance indicators was not undertaken, as at the end of the review period mining had not advanced to within 400 m of Pool P, and subsidence at Pool P had not been greater than 20mm/month.
- 2012 to 2014: The performance indicators were not exceeded during the reporting period. As required by the long-walls 20-22 Water Management Plan (Table 20) and long-walls 23-27 Water Management Plan (Table 19), Metropolitan Coal commissioned a peer review of the assessment, which concluded that the performance measure was not exceeded.

*Negligible **environmental consequences** over at least 70% of the stream length (that is no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining and minimal gas releases) for Eastern Tributary between the full supply level of the Woronora Reservoir and the main-gate of Long-wall 26.*

- **Monitoring of Environmental Consequences and Data Analysis to Assess against Performance Indicators**:
  - 2011 to 2013: Not applicable to Long-walls 20-22 (AR2012, Table 21, p57).
  - 2014: Monitoring was undertaken in accordance with the long-walls 23-27 WMP (Section 3.3.5.7, pp 135-138). During the reporting period, the mining of Long-wall 23 had not advanced to within 400 m of Pools ETAF to ETAU.
- **Data Analysis to Assess against Performance Indicators**
  - 2014: Data analysis was undertaken in accordance with the long-walls 23-27 Water Management Plan. During the reporting period, the mining of Long-wall 23 had not advanced to within 400 m of Pools ETAF to ETAU. (Data analysis not applicable to Long-walls 20-22).
- **Assessment of performance indicator/s and performance measures:**
  - 2014: The performance indicators were not exceeded during the reporting period.

5.3.5 Catchment Monitoring Assessment

5.3.5.1 Threatened Species, Populations and Ecological Communities[2]

Project Approval 08_0149 Schedule 3 Condition 1 requires negligible impact to threatened species, populations and ecological communities and upland swamps numbered 76, 77 and 92, in relation to environmental performance of the project.

It is assumed that threatened species, populations and ecological communities referred to in this condition relates specifically to values listed on the NSW *Threatened Species Conservation Act* 1995 (TSC Act).

The performance of the project in relation to biodiversity and negligible impact to watercourses (Waratah Rivulet and the Eastern Tributary) and cliffs (a performance measure of no more than 3% of the length of cliffs within the project study area may experience rock falls) are relevant as the watercourse and cliff values potentially provide important habitat resources for one or more threatened species, populations or ecological communities.

The Metropolitan Coal Project Environmental Assessment outlines the results of extensive surveys for threatened species, populations and ecological communities that occur within the project study area. No endangered populations were recorded within the project study area.

One endangered ecological community (EEC), Southern Sydney Sheltered Forest on Transitional Sandstone Soils in the Sydney Basin Bioregion occurs near to the project study area. This community occurs at greater than 400m from the long-walls 20-22 mining area and is therefore not likely to be at risk from mining impacts. The 2014 Annual Review noted that subsidence effects within the area of the EEC were within predicted limits. No impacts to this EEC have been reported.

[2] Matthew Richardson, Niche Environment and Heritage

5.3.5.2 Ecological Monitoring

Ecological monitoring programs for the project study area commenced in 2010 and have continued from 2011 to 2015. A summary of the monitoring program and the reported outcomes is provided in Table .

Table 5.3.5.2: Terrestrial ecological monitoring program and results to-date

Ecological parameter	Monitoring methodology	Monitoring results
Upland swamp – visual inspections	Monthly visual inspections of the upland swamp environments (Swamps 16, 17, 18, 20, 23, 24, 25 and 26 overlying Long-walls 20-22 and control Swamps 101, 111a, 125, Woronora River 1, Woronora River South Arm and Dahlia Swamp). The visual monitoring program is undertaken monthly throughout the swamps and is considered to be appropriate to detect the physical changes to the swamp environment.	Monitoring upland swamp vegetation has reported some random senescence of individual plants (not threatened species) in both control and impact sites.
Upland swamp – vegetation monitoring	Vegetation transects and quadrat monitoring within Upland Swamps (Swamps 16, 17, 18, 20, 24 and 25 above or adjacent to Long-walls 20-22 and control Swamps 101, 111a, 125, Woronora River 1, Woronora River South Arm and Dahlia Swamp).	Transect and quadrat monitoring of upland swamp vegetation has not indicated a statistically significant difference in the variation both within and between plots in both control and impact sites.
Monitoring indicator species within upland swamps and riparian habitats	An equal number of the same species of plants are monitored in both mined swamps and un-mined swamps/riparian zones for condition/health, mortality.	Monitoring indicator species within upland swamps and in riparian habitats (which include the threatened plant *Pultenaea aristata*) has not detected a statistically significant change to individual plant species abundance as a result of mining to date.
Riparian vegetation monitoring	Riparian vegetation monitoring was undertaken at several locations within the project study area.	Dieback was observed within the monitored riparian zones and was attributed to flooding caused by significant rainfall events at various times during the monitoring period.
Amphibian monitoring	Amphibian monitoring is undertaken at 12 sites (six control and six impact sites) between October to February, in streams that are being mined beneath and streams that are not.	Amphibian monitoring has recorded two threatened species (Giant Burrowing Frog and the Red-crowned Toadlet). No statistically significant differences between control and impact sites have been detected. It should be noted that the 2014 Annual Review reports specific inspections of Swamp 20 as a result of changes to the swamp hydrological regime were

Ecological parameter	Monitoring methodology	Monitoring results
		undertaken by Cenwest Environmental Services. Cenwest concluded that two threatened frog species (Giant Burrowing Frog and the Red-crowned Toadlet) are likely to be present within Swamp 20 albeit in small numbers. Cenwest further concludes that the consequences of the impacts would be limited to individuals of the two species at Swamp 20 and the local surrounds, and that the impacts are likely to be negligible.

Other environmental parameters which have the potential to impact biodiversity values in upland swamps includes changes in the near surface groundwater operating within upland swamps. Monitoring to date has indicated that while groundwater fluctuations are occurring in upland swamps, these fluctuations occur to similar degrees in both control and impact swamps, and that they are closely correlated to rainfall recharge and post rainfall discharge.

5.3.4 Review of Catchment Monitoring Program Performance

5.3.4.1 Annual Review

The assessment of environmental performance in relation to the Catchment Monitoring Program is reported in Section 3.1 of the Annual Review/AEMR.

The monitoring and assessment of the surface water and groundwater resources described in the Annual Review/AEMR in relation to the Catchment Monitoring Program is consistent with the programs described for the Extraction Plan for Long-walls 20-22 Water Management Plan (approved in April 2010) and Extraction Plan for Long-walls 23-27 Water Management Plan (approved April 2014).

The comprehensive threatened species, populations, ecological communities and upland swamps (numbered 76, 77 and 92), and terrestrial ecological monitoring program and results are provide in the Annual Review and findings of the monitoring programs are summarised in this report - section 5.2.5.

5.3.4.2 Independent Environmental Audit 2011

The status of the two recommendations arising from the 2011 Independent Environmental Audit were assessed during this audit of the Biodiversity Management Plan implementation:

(a) Identifying and including in the monitoring program several truly independent riparian vegetation monitoring sites; and
(b) Include winter surveys for Littlejohns Tree-frog in the amphibian monitoring program.

In response to these two recommendations, Metropolitan Coal corresponded with the NSW Department of Planning and Infrastructure in June 2012 and September 2012.

Metropolitan Coal stated that in relation to recommendation (a) *"extensive searches were conducted at the time of the Biodiversity Management Plan development in order to include independent riparian monitoring sites (i.e. sites outside the mining area). The searches indicated that no suitable mine sites were available outside of the mining area".* During the development of the Biodiversity Management Plan, DECCW, Department of Planning

and NSW Fisheries agreed that the approach included in the Biodiversity Management Plan *"was the best approach to riparian vegetation monitoring".*

In relation to recommendation (b) Metropolitan Coal responded to DP&I stating *"that while the Littlejohn's Tree Frog has been reported to be common at Darkes Forest, the species has not been recorded within the Project area or immediate surrounds. Accordingly, Metropolitan Coal has not revised the Biodiversity Management Plan to include surveys for the Littlejohn's Tree Frog".*

This Independent Environmental Audit acknowledges the level of survey effort undertaken for the project to date. In the absence of targeted surveys, should Littlejohn's Tree Frog be recorded in either the Spring of Autumn surveys for the project it is recommended that the Biodiversity Management Plan be amended to include a program specific to this species which would include winter survey and monitoring (i.e. targeted assessment and monitoring during the period of the species greatest activity).

Future assessments would benefit from targeted surveys to confirm the presence or absence of the amphibian species in a swamp (or stream), especially at those sites where the species are considered highly likely to be present, prior to, during and post mining to better quantify the impacts that mining may be having on them.

5.3.5 Matters Raised by Relevant Agencies

No specific matters relating to catchment monitoring and assessment were received from a consultation request to government agencies (OEH/EPA, DP&E SCA or DMR) undertaken in accordance with Project Approval 08_0149 Schedule 7 condition 8(b).

5.3.6 Catchment Management Plan Conclusions

The Catchment Monitoring Program was prepared in accordance with Project Approval 08_0149 Schedule 3 condition 2 and approved by DP&I on 14 November 2011. Revisions of the Catchment Monitoring Program were approved on 29 May 2013 and 25 August 2014.

The monitoring of surface water quality and quantity in accordance with the Extraction Plan Water Management Plans for Long-walls 20-22 and Long-walls 23-27, have been conducted in accordance with the various plans to address the requirements of the objectives in Project Approval Schedule 3 condition 1.

The extensive surface water and groundwater monitoring network implemented by Metropolitan Coal provides a sound program for the assessment of environmental performance of water management in the underground mining area within the Woronora Special Area. The monitoring and assessment of impacts on surface water and groundwater resources within the Woronora Special Area, described in the Catchment Monitoring Program, is consistent with the programs described for the Extraction Plan - Water Management Plans.

To date no statistically detectable impacts on threatened species, populations or ecological communities have been recorded from the various monitoring programs. It thus appears that Metropolitan Coal has satisfied the requirements of the Project Approval in relation to these matters.

5.4 Extraction Plans

[Project Approval 08_0149 Schedule 3 condition 6]

5.4.1 Extraction Plan – Long-walls 20-22

[Project Approval 08_0149 Schedule 3 condition 6]

The Extraction Plan for Long-walls 20-22 was prepared with assistance from Mine Subsidence Engineering Consultants, Gilbert and Associates, Heritage Computing, Cenwest Environmental Services, FloraSearch, Bio-Analysis and Kayandel Archaeological Services (the team of endorsed by the Director-General on 23 September 2009), to satisfy Project Approval Schedule 3 condition 6 and approved by DP&I on 14 May 2010.

The Extraction Plan outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of Metropolitan Coal Long-walls 20-22.

The objectives of the Extraction Plan are to:

- provide detailed plans of Long-walls 20-22;
- outline potential subsidence effects, impacts and environmental consequences of Long-walls 20-22;
- describe the measures implemented to ensure compliance with the subsidence performance and mitigate, manage and remediate potential subsidence impacts and environmental consequences; and
- detail a monitoring and contingency plan for potential subsidence impacts and environmental consequences, including performance indicators for subsidence performance measures.

Table 5.3.1: Schedule of Secondary extraction of Long-walls 20-22.

Long-wall No.	Secondary Extraction Commenced	Extraction Completed
Long-wall 20	May 2010	August 2011
Long-wall 21	September 2011	January 2013
Long-wall 21A	January 2013	August 2013
Long-wall 22B	August 2013	April 2014

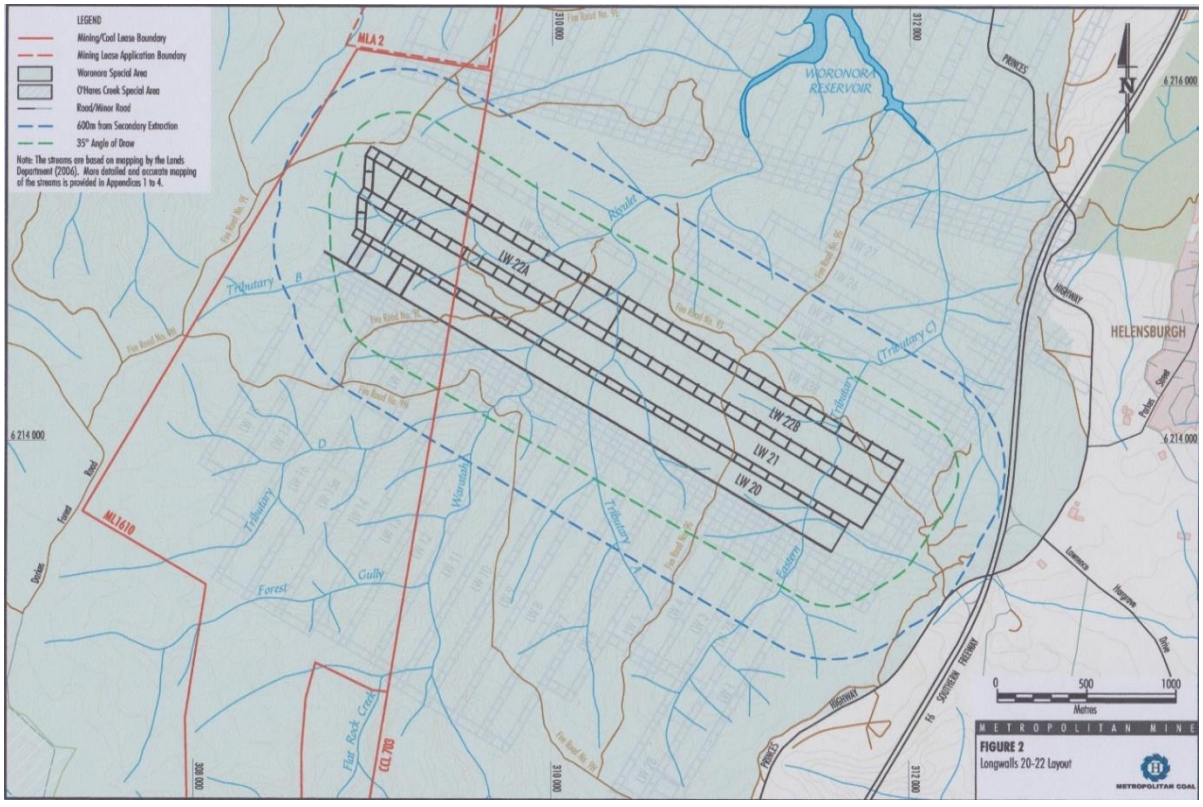


Figure 5.3.1: Metropolitan Coal Long-walls 20-22

5.4.2 Extraction Plan –Long-walls 23-27

[Project Approval 08_0149 Schedule 3 condition 6]

The Extraction Plan for Long-walls 23-27 was prepared with assistance of the team of suitably qualified and experienced experts endorsed by the Director-General on 23 September 2009, to satisfy Project Approval Schedule 3 condition 6. Approval of the Extraction Plan for Long-walls 23-27 was approved with conditions on 9 April 2014. The Extraction Plan outlines the proposed management, mitigation, monitoring and reporting of potential subsidence impacts and environmental consequences from the secondary extraction of Metropolitan Coal Long-walls 23-27.
The objectives of this Extraction Plan are to:

- provide detailed plans of Long-walls 23-27;
- outline potential subsidence effects, impacts and environmental consequences of Long-walls 23-27;
- • describe the measures that will be implemented to ensure compliance with the subsidence performance measures and mitigate, manage and remediate potential subsidence impacts and environmental consequences; and
- detail a monitoring and contingency plan for potential subsidence impacts and environmental consequences, including detailed performance indicators for subsidence performance measures.

Long-walls 23-27 are located adjacent to Long-walls 20-22 at the Metropolitan Coal Mine. Secondary extraction of Long-wall 23 commenced in February 2014.

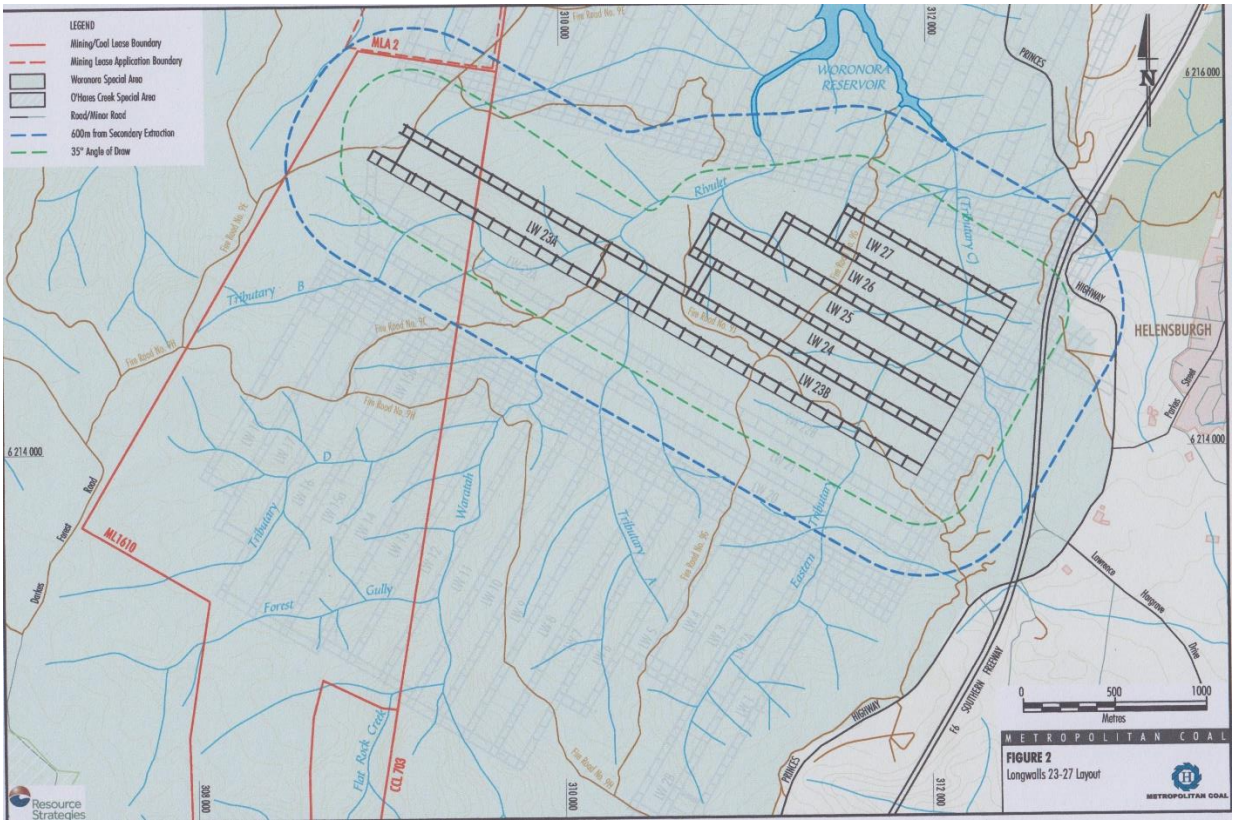


Figure 5.3.2: Metropolitan Coal Long-walls 23-27

Table 5.3.2: Schedule of Secondary extraction of Long-walls 23-27

Long-wall No.	Secondary Extraction Commenced	Extraction Complete / Planned
Long-wall 23A	May 2014	September 2014
Long-wall 23B	September 2014	March 2015
Long-wall 24	April 2015	August 2015
Long-wall 25	September 2015 (planned)	March 2016 (planned)
Long-wall 26	April 2016 (planned)	August 2016 (planned)
Long-wall 27	September 2016 (planned)	November 2017 (planned)

5.4.3 Extraction Plan - Sub-Plans

[Project Approval 08_0149 Schedule 3 condition 6(f) and 6(g)]

The following management plans were prepared to accompany the main text of the Extraction Plan to address the various components of the area subjected to underground mining where potential impact from subsidence could occur and to provide management, mitigation and monitoring of the surface area that may be implicated.

5.4.2.1 Subsidence Monitoring Program

[Project Approval 08_0149 Schedule 3 condition 6]

The Extraction Plan for Long-walls 20-22 and Long-walls 23 to 27 Subsidence Monitoring Program were prepared to satisfy Project Approval 08_0149 Schedule 3 condition 6 and approved in May 2010 and April 2014 respectively. The Subsidence Monitoring Program to validate subsidence predictions and analyse the relationship between the subsidence effects and subsidence impacts of the Metropolitan Coal Long-walls 20-22 Extraction Plan in accordance with Condition 6, Schedule 3 of the Project Approval.

The objectives of the subsidence monitoring programs are to monitor the subsidence parameters and subsidence impacts about Long-walls 20-22 and Long-walls 23-27 extraction and to provide subsidence parameter and subsidence impact data required as part of the management of environmental consequences. The monitoring programs include:

– Water Management Plan;
– Biodiversity Management Plan;
– Land Management Plan;
– Heritage Management Plan;
– Built Features Management Plan; and
– Public Safety Management Plan.

The monitoring have been developed to validate subsidence predictions and provide subsidence data to improve the predictive methods for a better understanding of the underlying factors contributing to ground movement.

The Subsidence Monitoring Program includes subsidence parameter monitoring (i.e. the actual movement of the ground surface) and subsidence impact monitoring (e.g. surface cracking).

In accordance with the Subsidence Monitoring Program a comparison between the predicted and observed subsidence movements for specified monitoring lines above or near Long-walls are surveyed.

The subsidence monitoring results reviewed for comparison between the predicted and observed subsidence movements between 2011 and 2014 conducted by Mine Subsidence Engineering Consultants (MSEC) were found to be generally within survey tolerance of predicted movements.

5.4.2.2 Water Management Plan

[Project Approval 08_0149 Schedule 3 condition 6(f)]

Extraction Plans for Long-walls 20-22 and Long-walls 23-27 Water Management Plans were prepared with assistance from Gilbert and Associates, Heritage Computing, Mine Subsidence Engineering Consultants (MSEC) and Evans & Peck to manage potential environmental consequences on watercourses (including the Woronora Reservoir), aquifers and catchment yield in accordance with Project Approval Schedule 3 condition 6.

The document Revision Status Register notes that Long-walls 20-22 Water Management Plan Rev A was distributed to the SCA, DECCW and DP&I. Subsequent revisions Long-walls 20-22 Water Management Plan Rev B (dated 14 May 2010) addressed comments by the SCA; and Water Management Plan Rev C (dated 14 November 2011) addressed comments by the SCA and NOW and review/revision following submission of 2010 Annual Review.

The Water Management Plan Revision Status Register Extraction Plan - Long-walls 23-27 Water Management Plan Rev A and Rev B, indicated the documents were distributed to the DP&I, SCA, OEH and NOW. Water Management Plan Rev C dated 9 April 2014 addressed comments from the DP&I and SCA was distributed to these parties.

The Extraction Plan Water Management Plans describe the surface water monitoring programs which include:

- surface water flow at the SCA-owned gauging station on the Waratah Rivulet (GS2132102), gauging station on the Woronora River (GS2132101); the Metropolitan Coal-owned gauging station on the Eastern Tributary and gauging station on Honeysuckle Creek (control site); and OEH gauging station on O'Hares Creek at Wedderburn (GS213200);
- pool water levels on Waratah Rivulet, Waratah Rivulet, Tributary B, and control Pools on the Woronora River;
- Woronora Reservoir leakage;
- stream features - visual and photographic surveys of the Waratah Rivulet (from Flat Rock Crossing to the full supply level), Tributary A and Tributary B, and Eastern Tributary (from within the 35° angle of draw of Long-walls 20-22 to the full supply level), are conducted monthly until subsidence is less than 20 mm/month, and thereafter within three months of the completion of each long-wall.
- stream water quality on the Waratah Rivulet, Tributary B; Tributary D; Eastern Tributary; Far Eastern Tributary; Honeysuckle Creek; Bee Creek and Woronora River; and
- Woronora and Nepean Reservoir.

The Extraction Plan Water Management Plans also describe the groundwater monitoring programs which include:

- monitoring groundwater levels at swamps, shallow and deep groundwater systems on a monthly basis;
- water level measurements from electronic data loggers downloaded on a monthly basis;
- comparing the measured groundwater levels with the predicted water levels from the groundwater model every six months; and
- presenting the monitoring data and the model verifications within the Annual Review.

Management measures implemented to remediate impacts on water resources and watercourses are provided in the Extraction Plan Water Management Plans section 8, Rehabilitation Management Plan section 7.2, and contingency plans, including consideration of adaptive management under circumstances where a water resource or watercourse performance measure has been exceeded.

The performance indicators and subsidence impact performance measures were developed in the Project Environmental Assessment (2008), Preferred Project Report (2009) and Extraction Plan Long-walls 20-22 (2010) and Long-walls 23-27 (2013), to address the predictions of impacts and environmental consequences on water resources and watercourses.

5.4.2.3 Biodiversity Management Plan

[Project Approval 08_0149 Schedule 3 condition 6(f)]

The Extraction Plan - Biodiversity Management Plans have been prepared to satisfy Project Approval Schedule 3 Condition 6(f) to manage the potential environmental consequences of Long-walls 20-22 and Long-walls 23-27, on aquatic and terrestrial flora and fauna, with a specific focus on swamps.
The Biodiversity Management Plans were prepared in consultation with relevant government agency stakeholders, including OEH. The latest revision of the Biodiversity Management Plan is dated June 2014.

The upland swamp vegetation monitoring program includes visual monitoring, transect/quadrat monitoring and monitoring of indicator species. Eight upland swamps, viz. Swamps 16, 17, 18, 20, 23, 24, 25 and 26 have been mapped above or immediately adjacent to Long-walls 20-22. A swamp substrate characterisation study was also conducted to contribute to Metropolitan Coal's understanding of the ecological, hydrological and geomorphic processes of swamps over Long-walls 20-22.
With the exception of in-valley Swamp 20, which supports Tea Tree Thicket, all swamps over Long-walls 20-22 are small valley side swamps and comprise Restioid Heath, with intergrades with Banksia Thicket. Transitions between Restioid Heath and Banksia Thicket are thought to be driven by fire frequency.

Three swamps (Swamps 16, 17 and 23), although showing seepage, are more akin to sandstone heath woodland with low tree densities. The vegetation contains species found in upland swamps, mixed with a range of non-swamp species.

Swamps 101, 111a and 125 have been selected as control sites for the Restioid Heath/Banksia Thicket valley side swamps and Swamps Woronora River 1, Woronora River South Arm and Dahlia Swamp have been selected as control sites for the Tea Tree Thicket vegetation of Swamp 20.

Visual inspections of Swamps 16/17, 18, 20, 23, 24, 25 and 26 were conducted monthly by Eco Logical Australia when Long-walls 20, 21 or 22 were within 400 m of a swamp to record evidence of potential subsidence impacts. During the reporting period, were inspected monthly by Metropolitan Coal when mining was within 400 m of these swamps.

No major cracking of exposed bedrock areas (including areas where water flow was evident) or swamp sediments was observed during the visual inspections of Swamps 16/17, 18, 23, 24, 25 and 26. No areas of erosion, changes in water colour or changes in vegetation condition (e.g. unusual vegetation dieback) were observed during 2012 to 2014.

MSEC compiled a comprehensive visual survey and photographic record of the waterways in December 2011 to provide a baseline for future assessment of monitoring for subsidence impacts:

- along the Waratah Rivulet from Flat Rock Crossing to the full supply level;
- along the Eastern Tributary within the 35° angle of draw of Long-walls 20-22 to the full supply level;

- along Tributary A within the 35° angle of draw of Long-walls 20-22; and
- along Tributary B within the 35° angle of draw of Long-walls 20-22.

5.4.2.5 Land Management Plan

[Project Approval 08_0149 Schedule 3 condition 6(f)]

The Extraction Plans for Long-walls 20-22 and Long-walls 22-27 Land Management Plans were prepared to satisfy Project Approval 08_0149 Schedule 3 condition 6(f) for the management of potential environmental consequences of the secondary workings on cliffs, overhangs, steep slopes and land in general.

The Land Management Plans indicate the total length of cliffs and associated overhangs within the mining area is approximately 762 m. The total length of cliffs and associated overhangs within the mining area that may potentially experience cliff instability is less than 23 m.

The subsidence impact performance measure was not exceeded during the 2011 to 2015 period and implementation of the Land Management Plans and associated management processes are considered to be adequate.

5.4.2.4 Built Features Management Plan

[Project Approval 08_0149 Schedule 3 condition 6(f)]

The Extraction Plan for Long-walls 20-22 and Long-walls 23-27 Built Features Management Plans were developed in consultation with the relevant asset owner, to satisfy Project Approval 08_0149 Schedule 3 condition 6(f), to manage the potential environmental consequences of the Metropolitan Coal Long-walls secondary extraction on built features.

Site inspection monitoring was conducted prior to the commencement of secondary extraction of each Long-wall panel to establish the condition of the infrastructure items. A program was implemented to monitor subsidence impacts on the following infrastructure in accordance with the Built Features Management Plans:

- Endeavour Energy (previously Integral Energy) infrastructure;
- Nextgen infrastructure;
- TransGrid infrastructure;
- Optus infrastructure;
- Telstra infrastructure;
- Roads and Maritime Services (RMS) (previously Roads and Traffic Authority [RTA]) infrastructure;
- RailCorp infrastructure;
- Sydney Water infrastructure; and
- Wollongong City Council.

Specific performance indicators were developed for the various infrastructure items and are outlined in the Built Features Management Plans.

In relation to the Built Features Management Plan – RMS, Cardno Pty Ltd assessed the monitored bridge movements at the end of each survey (i.e. monthly when each long-wall is within 1,000 m of the finish line). The assessments concluded that there were no differential movements of any concern.

Heritage Subsidence Impact Performance Measure – Garrawarra Centre is located more than 3 km from Long-walls 20-22 and at that distance no measurable systematic or non-systematic subsidence movements were indicated.

No impact to any built feature was evident over the reporting period.

5.4.2.5 Heritage Management Plan

[Project Approval 08_0149 Schedule 3 condition 6(f)]

The Extraction Plan for Long-walls 20-22 and Long-walls 22-27 Heritage Management Plans were prepared to satisfy Project Approval 08_0149 Schedule 3 condition 6(f), to manage the potential environmental consequences on Aboriginal heritage sites or values.

A monitoring program was implemented to monitor the impacts and consequences of project related subsidence on Aboriginal heritage sites in January and March 2012. The results of the monitoring recorded subsidence impacts to two sites (site FRC 281 and site FRC 284).

Monitoring in July/August 2013 included all Aboriginal heritage sites located within the 35º Angle of Draw for Long-walls 20 and 21, by a monitoring team including an archaeologist (with experience in rock art recording and management) and Aboriginal stakeholder representatives.

The monitoring results are used to assess the Aboriginal heritage items/sites against the subsidence impact performance measure (i.e. *"Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts"*). For the purpose of measuring performance against the Aboriginal heritage subsidence impact performance measure, sites are considered to be *"affected by subsidence impacts"* if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration:

- overhang collapse;
- cracking of sandstone that coincides with Aboriginal art or grinding grooves; and/or
- rock fall that damages Aboriginal art.

The Heritage Management Plan – Subsidence Impact Register is used to progressively monitor the cumulative number and percentage of Aboriginal heritage sites affected by subsidence impacts.

Three sites (sites FRC 15, FRC 284 and FRC 281) have been identified as being impacted by the effects of mining induced subsidence (i.e. 2% of the total Aboriginal heritage sites within the mining area) between 201`1 and 2015.

The Aboriginal heritage subsidence impact performance measure was not exceeded between 2011 and 2015.

5.4.2.6 Public Safety Management Plan

[Project Approval 08_0149 Schedule 3 condition 6(g)]

The Extraction Plans for Long-walls 20-22 and Long-walls 22-27 Public Safety Management Plans were prepared to satisfy Project Approval 08_0149 Schedule 3 condition 6(f), to manage the potential consequences of secondary workings subsidence on public safety within the underground mining area.

Hazards identified in relation to public access to the underground mining area that may arise as a result of the Metropolitan Coal Long-walls 20-22 secondary workings include:

- damage to fire trails (e.g. cracks);
- dislodgement of rocks onto fire trails or roads;
- dislodgement of rocks from cliffs and overhangs;
- entrapment by fire caused by locked gates;
- vehicle collision with monitoring equipment located near fire trails; and
- slips, trips and falls by visitors to the tributaries

Monitoring of cliffs and overhangs, steep slopes and land in general has been conducted for subsidence impacts in accordance with the Extraction Plans Land Management Plans, and of infrastructure items in accordance with the Built Features Management Plans. No subsidence impacts were identified during the 2011 to 2015 period that were considered to pose a risk to public safety.

The general public is not permitted to access the Woronora Special Area for any recreational or other purpose. No safety incidents were reported by visitors, personnel or contractors in the underground mining area during the 2011 to 2015 period.

Neither the performance indicator, nor the built features subsidence impact performance measure were exceeded during the 2011 to 2015 period.

No management measures relating to subsidence impacts have been required over the reporting 2011 to 2015 in relation to public safety.

5.4.4 Environmental Assessment Subsidence Predictions

The Environmental Assessment (2008) stated that Extraction Plans (which include subsidence monitoring programs) will be progressively prepared for approval by DPI-MR for underground mining activities, prior to commencement of each long-wall (or group of long-wall panels proposed for a maximum of up to 7 years).

The Applications for these Extraction Plans would be prepared in accordance with the - *Guideline for Applications for Subsidence Management Approvals* (NSW Department of Mineral Resources 2003) and *New Approval Process for the Management of Coal Mining Subsidence – Policy* (DMR, 2003).

The Subsidence Monitoring Programs document the monitoring of potential subsidence impacts on key surface features:

- Subsidence monitoring (subsidence survey lines and/or visual inspections) conducted to quantify subsidence resulting from long-wall mining.
- Monitoring measures of relevance to potential subsidence impacts on groundwater, surface water, aquatic ecology, terrestrial flora and fauna, Aboriginal and non-Aboriginal heritage and visual character
- Monitoring of infrastructure items will be undertaken as relevant Project long-walls are mined to confirm observed ground movements are consistent with the subsidence predictions and identify potential impacts and required remedial measures.
- Monitoring of Built Features is described in the specific Built Features Management Plans prepared for specific infrastructure items as required, including:
    - Illawarra Railway;
    - F6 Southern Freeway including bridges;
    - Princes Highway;
    - Garrawarra Centre;
    - electrical services;
    - optical fibre and copper telecommunications cables;
    - Woronora Dam road, fire trails in the Woronora Special Area and other minor roads;
    - Sydney Water pipelines;
    - houses in close proximity to the Project Underground Mining Area; and
    - rural buildings, tanks and farm dams.
- Geological investigations undertaken progressively during the life of the Project to confirm subsidence predictions and the development of subsidence management measures where relevant.

Subsidence predictions are developed for each Long-wall (or set of Long-walls) and presented in the Extraction Plans, for assessment and review of subsidence management and impact against the subsidence monitoring data collected annually for the project.

5.4.5 Subsidence Assessment[3]

5.4.5.1 Subsidence Monitoring Program

The subsidence related impacts of mining during the period between January 2012 and January 2015. Mining activities during this period included the development and extraction of long-walls 21, 22A/B and 23A/B in the Bulli Seam have been assessed for this audit.

The annual reports included time-dependent subsidence review along Survey Line D above LWs 1 - 18 goaf. Several conventional subsidence lines and individual monitoring points established along or across existing fire trails, ridge crests, swamps, the Waratah Rivulet and the Eastern Tributary measure stream bed subsidence, valley closure/uplift and cliff line subsidence. Environmental monitoring stations including deep (vibrating wire) and shallow (standpipe) piezometers and surface flow gauges to monitor changes to ground and surface water levels and water quality within the Woronora Reservoir catchment have been established.

Visual and photographic surveys of the Waratah Rivulet (from Flat Rock Crossing to Woronora Reservoir full supply level) and Eastern Tributary (from 35o angle of draw from LW20 to 22 and Woronora Reservoir full supply level), were conducted on a monthly basis when long-walls 20 to 22 were within 400 m of the watercourses. Monthly monitoring continued until subsidence was effectively completed (< 20 mm/month) and/or within 3 months after each long-wall was completed. Tributary A and Tributary B have been inspected and photographed within 3 months after each long-wall was completed only.

Water quality sampling and testing at a NATA registered laboratory were also completed and reported on during the 2012 to 2014 period. The data was used to monitor mining impacts and also calibrate established numerical models to predict future ground and surface water level and quality impacts due to mining.

The performance measure for known Aboriginal Heritage sites within the project area, requires that <10% of the sites may be impacted by overhang collapse, cracking through rock art or grinding grooves, or rock fall impacts to art. Monitoring of the sites is required 3 to 6 months after second workings occurs within a 35^{o} angle of draw from the sites.

Built Features environmental monitoring included measurement of 3-D subsidence effects on the Princess Highway, two overpass bridges for the Southern Freeway, 330kV Transmission Towers and 132kV power line easements to the east of the mine workings.

5.4.5.2 Reported Impacts

A summary of the predicted v. measured subsidence effects and associated impact review after the completion of long-walls 20 to 23A are presented below:

- Measured subsidence above the completed panels were typically less than or not more than 15% greater than predicted values. (Note: Additional numerical subsidence modelling was therefore not required).
- Valley closure and uplift were minor and significantly less than predicted values.
- Minor impact (i.e. cracking) or instability has been observed along Cliff No's COH1 and COH2 (one 2 m long x 1 m wide x 0.3 m thick rock fall at COH2 above LW20). The impact represents 0.25% of the total

[3] Steve Ditton, Ditton Geotechnical Services (DgS) Pty Ltd

length of cliff (772 m) in the Project Area and complies with the Performance Measure that requires <3% of total cliff line length may be impacted by mining.

- No impact (i.e. cracking) or instability was observed on steep slopes and complies with the Performance Measure that tension cracks should not exceed 0.1 m width and 25 m length due to mining.
- To-date, tensile and compressive shear cracking up to 22 m long, hairline to 50 mm wide and up to 1.5 m deep have occurred to rock bars at several locations along the Waratah Rivulet (between Pools F and H near Flat Rock Crossing). Similar rock bar cracking was also observed further downstream at Pool N (above long-walls 20 and 21). A section of the downstream rock bar appears to have collapsed along a persistent joint. The impacts were consistent with the range of predicted impact expected due to valley closure mechanisms and conventional subsidence effects.
- Sixteen surface pools along the Waratah Rivulet between Pools A and P and sixteen Eastern Tributary Pools from ETA to ETU have been impacted by the observed mine subsidence to-date. Impacts include shallow surface cracking, iron staining, cloudy water quality and isolated methane gas releases. All of the observed impacts were identified in the Environmental Assessment (2009).
- Surface water flows through fracture networks in downstream rock bars at Pool G/G1 (Flat Rock Crossing) and N (WRS5) have been assessed by the mine as requiring PUR Grout Injection Remediation in accordance with the long-walls 20 to 22 (Water Management Plan Performance Indicator for surface water impacts). Monitoring indicates that several Pool water levels have dropped below "cease to overflow" levels at Pools A, F, G and N since mine subsidence has occurred.
- Gas releases up to May 2015 at Ponds K, L, O and P have triggered the following actions according to the long-walls 20-22 Water Management Plan - weekly monitoring to determine the extent of the gas releases; gas sampling for emission characterisation testing; and assessment of environmental effects to ecological systems (water quality and aquatic flora and fauna.
- Stream and groundwater quality sampling and testing along the Waratah Rivulet and Eastern Tributary have identified elevated dissolved Fe, Mn and Al and depressed pH (5 - 6) that have exceeded the Performance Indicator for natural variation (95% Confidence Limits) expected for pre-mining or baseline conditions. To-date, independent consultant review (Evans and Peck, 2012 & 2013) of the observed impacts to the Waratah Rivulet and Eastern Tributary indicate that the Performance Measures associated with water quality and biodiversity have not been exceeded for the Woronora Reservoir catchment.
- Mining related impact to upland or valley swamp surface and groundwater levels have been detected in swamps that exist within a 35^{o} angle of draw from long-walls 20 to 22 (S1618, 20 and 25). Paired piezometers in the sub-strata and underlying sandstone units supporting the swamps, clearly show natural recharge/discharge cycles are continuing to occur. Minor erosion and seasonal dieback of small areas of vegetation has been observed in some of the swamps above long-wall 21. Impacts to Swamp 20 have also included minor surface cracking, no stream flow through the swamp during dry periods, iron staining at the end of a rock bar and lowering of the water table by ~ 1 m. The Performance Measures for the swamp have not been exceeded during the 2012 to 2014 period according to environmental consultant Eco Logical Australia.
- Three Performance Indicators (PI) for connective cracking assessment between the Woronora Reservoir and mine workings were developed in the Water Management Plan. The first two indictors are indirect measures of sub-surface cracking height (i.e. underground visual inspections of strata water make above the goaf from incumbent strata and 20-day average water make determined from estimated mine water use). The third Performance Indicator compares the measured piezometric head profiles down through the overburden with the predicted low and high-inflow model outcomes after the extraction of long-walls 20 to 22. An exceedance would be assessed if the predicted piezometric heads were lower than or plotted to the left of the high-inflow model profile.
- The outcomes of the data reviews to-date indicate that no abnormal groundwater inflows have occurred into the goaf and mine water makes are well within the 20-day average or 2 ML/day.

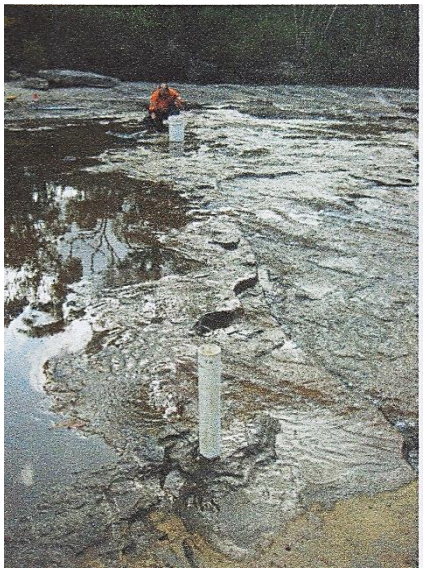
- The multi-piezometer readings in two deep boreholes above long-wall 22 and 600m west of the extraction limits of long-wall 21 indicate that the measured profiles are within the predicted model profiles that assume low and high water flows through the strata. It is noted that de-pressurization of confined aquifers in the overburden have occurred up to 100 m above the Bulli Seam to the top of the Scarborough Sandstone or base of the Stanwill Park Claystone Units due to connective sub-surface fracturing above the workings. Observed piezometric heads are similar to low flow model predictions at Bulli Seam level. Discontinuous fracturing appears to have developed in the Bulgo Sandstone with groundwater levels dropping by approximately 75 m to-date. It is noted that some piezometer readings have taken a long time to reach equilibrium due to the low permeability of the rock mass unit in which they are situated. It is also noted that a calibrated ground water model and extensive multi-piezometer monitoring program has been developed to improve the mines ability to assess the impact of mining on the groundwater regime within the project area. (As mentioned in the previous 2011 audit, the use of multi-wired extensometers above the extracted long-walls would complement the piezometer readings and demonstrate that the height of fracturing estimate directly above the long-walls is being correctly assessed by the "off panel" piezometers. It would also enable the establishment of the link between ground piezometer behaviour and strata dilation magnitudes. Note: The installation of a multi-wire extensometer was suggested in the previous independent audit period (2009-2011) but not considered necessary or affordable (by the mine) at this stage, due to the level of confidence in the VWP monitoring results).
- Performance Indicators for assessing whether there is leakage occurring from the Woronora Reservoir and catchment generally have been developed as indicated, since the last Audit period. The weekly water levels in ridge line bores and transects across the Waratah Rivulet and Eastern Catchment indicate a hydraulic gradient towards the reservoir has been maintained during the 2012 to 2014 audit period. It was assessed that there no exceedances of the Performance Indicators that would detect whether there have been mining induced losses from the Reservoir or upstream catchment watercourses.
- One Aboriginal Heritage Site (FRC 281) has been impacted by cracking through art and represents < 1% of the Project Area sites.
- No subsidence effect or impact exceedances have occurred at any of the built features.

5.4.5.3 Remediation Works

Project Approval Schedule 6 condition 1 required that the surface flows and pool storage function downstream of Flat Rock Crossing on the Waratah Rivulet shall be restored. It is understood that the required $100K grant for rehabilitation of the SCA Catchment was used to complete the grouting works upstream of Flat Rock Crossing cross the creek sections impacted by LWs 1 to 18 (Pools A and F).

The Metropolitan Coal Rehabilitation Plan (Version E) was approved by the DRE in May, 2014 with improved stream flow remediation activities commencing at Pool F in June, 2014.

PUR injection campaigns have been conducted every six months at Pools A and F for approximately 4 years. Assessment of the effectiveness of the grout to restore surface flows, pond function and pond level recession rates during low flow periods to pre-mining impacts is on-going, but appears to be effective at this stage based on observed pool level recovery since the grouting works.



PUR Injection Site on Waratah Rivulet upstream of Flat Rock Crossing (WRS4)

Completed Rock Bar Crack Repair on Waratah Rivulet upstream of Flat Rock Crossing (WRS4)

Further PUR grouting works for Pools G and G1 are proposed to commence in May 2015 after successful completion of Pool F. It is noted that the grouting works contractor was changed in 2014 in order to improve the quality and efficiency of the grouting works. Further grouting works at Pool N was also discussed by Mine Site representatives during the field inspection.

5.4.5.4 End of Panel Reports (EOPR)

The End of Panel Reports for long-walls 21 and 22 have been provided to the DRE during the 2012 to 2014 audit period. The reports included the results of the Subsidence Monitoring Program which forms part of the Extraction Plan for long-walls 20 to 22.

In summary, measured surface subsidence effects and impacts were generally within predicted ranges with measured subsidence above the completed panels typically less than or not more than 15% greater than predicted values.

A few prediction exceedances occurrences where measured subsidence was in excess of predicted subsidence effects were associated with disturbed pegs or movements that were within the accuracy of the survey and prediction methods (i.e. the subsidence magnitudes were very low). The observed subsidence impacts were also consistent with, or less than those predicted.

The End of Panel Reports timing of ~6 months coincide with the 6-monthly reporting requirements of the Extraction Plan.

5.4.5.5 Site Inspection

An inspection of some of the impacted surface features within the zone of subsidence effect from long-walls 20 to 21 was conducted by a Principal Geotechnical Engineer from DgS on the 26 May 2015:

- PUR injection site (WRS4) on the Waratah Rivulet upstream of Flat Rock Crossing. Low-stream flows and pools have apparently been restored at the site. High quality of crack repair works finishing was noted (grout colour blending with rock bar)

- The stream and pool gauging and subsidence monitoring stations along Waratah Rivulet and downstream of Flat Rock Crossing to Pool N (WRS5). Strong stream flows had impacted vegetation along creek after recent rains.
- Several open and persistent subsidence cracks across the creek (10 - 20 mm wide on east-west strike) were observed upstream and downstream of Flat Rock Crossing along Waratah Rivulet.
- Brown iron staining of creek bed along Waratah Rivulet. Note: Iron floc was generally absent in the water way at the time of inspection after a recent period of high rainfall.

Creek bed Iron Staining due to LWs 20-21 Downstream of Flat Rock Crossing

Creek Bed Iron Staining at Cliff COH1 (Downstream of Flat Rock Crossing) due to LWs 20-21

- Two gas emission sites in pools between Flat Rock Crossing and LW20's southern extraction limit (Pool L). Note: One of the sites was known to exist prior to LW20 with the second site appearing after the passing of LW20.
- A 2 m long rock fall observed at Cliff COH2.

Section of Overhang at Cliff OH2 where Rock Fall Occurred along Waratah Rivulet above LW20 (downstream from Flat Rock Crossing)

Section of Overhang at Cliff OH2 where Rock Fall Occurred along Waratah Rivulet above LW20 (downstream from Flat Rock Crossing)

- Transverse cracking and partial collapse of rock bar downstream from Pool N (above LW21 Maingate) that will require PUR grouting to restore pond function during drier periods.

Activated Joint & Bedding Shear on Rock Bar at Pool N across Waratah Rivulet above LW 21 (downstream from Flat Rock Crossing)

Tensile Cracking on Rock Bar at Pool N across Waratah Rivulet above LW 21 (downstream from Flat Rock Crossing)

- Fire Roads 9H - No impacts observed.
- Inspection of Deep Vibrating Wire Piezometer Site (9HGW1) above LW18

There were no perceptible differences between conditions observed at the sites visited and the previous 2011 audit site visit or the level of impact reported in the annual environmental management documentation for the period.

5.4.5.6 Compliance Assessment - Adequacy of the Strategies

The information being collected by Metropolitan Coal is considered adequate for meeting the adaptive management objectives of current and future Extraction Plan standards and allows for the review and assessment of necessary mitigation or remediation strategies should environmental impact exceedances occur.

Actual subsidence and impact predictions at surface features within the area of influence of mining have generally been less than or consistent with the Environmental Assessment predictions. Several environmental Performance Indicators for Surface Water Quality and Gas Releases along Waratah Rivulet and Eastern Tributary have been exceeded during the audit period, however, independent review indicates that none of the Performance Measures specified in the Project Approval conditions have been exceeded at this stage.

It is also noted that the surface flow model (AWBM) is continuing to be updated and/or improved upon by the mine in consultation with SCA and Gilbert & Associates Pty Ltd. The groundwater model is also being reviewed and updated by Heritage Consulting Pty Ltd.

Overall, the current strategies, plans and programs for managing mine subsidence impacts to the environment, built features and public safety are therefore considered to be performing adequately.

In particular, it is considered that the mine has generally developed clearly defined performance indicators to effectively assess changes or impacts to sensitive environmental features such as the Waratah Rivulet, upland and valley swamps, cliffs and aquatic/terrestrial biota. The PUR remediation program has also been successful in restoring surface flows and pool storage function above the previously impacted creek section above LWs 1 to 18.

5.4.4.7 Observations on Reporting of Valley Closure Measurement Data:

There are a few minor issues with the subsidence assessments to-date that could be clarified during the next reporting period, in regards to the reporting of measured v. predicted valley closure parameters:

(i) The end-of-panel reports present the measured Net Vertical Movement and the Up-sidence only. Assuming that the Subsidence = Net Vertical Movement + Up-sidence it is unclear how the Up-sidence is measured without estimates of Subsidence at a given location.
(ii) The compressive strains associated with valley closure mechanism have been shown graphically in the review reports, but are not compared to predictions in the Tables in the text.
(iii) It is also unclear why survey accuracy would decrease from +/-20 mm to +/-50 mm outside the limits of extraction. It is considered more likely that the apparent increase in subsidence is related to the elastic compression of the strata and coal seam under abutment loading conditions.
The above increase has implications for measured angle of draw, but unlikely to change the magnitude of surface impact, due to the very low tilt and strains associated with the low subsidence magnitudes.

5.4.6 Conclusions Subsidence

The Extraction Plans for the Metropolitan Coal underground mining have been prepared in accordance with the Environmental Assessment and subsidence predictions are presented in each Extraction Plan and the documents approved prior to commencement of the nominated Long-walls.

Based on the review of the of the Project Approval conditions, Extraction Plans, AEMR documents for 2012 to 2014 and End of Panel Reports for long-walls 21 and 22, it is concluded that the Metropolitan Mine has complied with the conditions for mine subsidence impact management for the 2012 to 2014 audit period.

The information being collected is considered adequate for meeting the adaptive management objectives of current and future Extraction Plan standards and allows for the review and assessment of necessary mitigation or remediation strategies should environmental impact exceedances occur.

Actual subsidence and impact predictions at surface features within the area of influence of mining have generally been less than or consistent with the Environmental Assessment predictions.

5.5 Research Program

[Project Approval 08_0149 Schedule 3 condition 9]

5.5.1 Research Program Implementation

[Project Approval 08_0149 Schedule 3 condition 9]

A Metropolitan Coal Research Program was developed in consultation with the NSW Office of Water, Sydney Catchment Authority, DECCW/OEH and DII to satisfy Project Approval Schedule 3 condition 9. The Research Program was approved by DP&I in May 2011. The approved Research Program comprises the following three projects:

- Conservation of the Eastern Ground Parrot on the Woronora Plateau - a targeted regional survey that has been and will continue to be undertaken by OEH for the Eastern Ground Parrot across the Woronora Plateau using bio-acoustic monitoring to assess the presence and size of any populations, and establish the relationship to site attributes. The project involved deployment of 35 ‘song meters’ to remotely detect the calling Ground Parrot within suitable habitat on the Woronora Plateau. A total of 3,000 hours of data were recorded over 588 survey days. The Ground Parrot was not detected leading OEH to conclude the species is not likely to be resident on the Woronora Plateau. The survey will be repeated in 2016-2017.
- Evaluation of Fundamental Geotechnical Mechanisms Contributing to Valley Closure Subsidence Effects Under Irregular Topographic Conditions - undertaking research in the evaluation of fundamental

geotechnical mechanisms contributing to valley closure subsidence effects under irregular topographic conditions using numerical modelling techniques, being conducted by the School of Mining Engineering, The University of New South Wales, under the supervision of Professor Bruce Hebblewhite and Dr Rudrajit Mitra. Mr Chengguo Zhang; and

- Significance of Chain Pillars on Simulated Groundwater Pressures – investigating the role played by chain pillars in isolating groundwater pressure reductions above mined long-wall panels, and whether they might limit the outwards propagation of pressure reductions and environmental effects, being undertaken by Dr Noel Merrick from Heritage Computing.

5.5.2 Conclusion – Research Program

The Metropolitan Coal Research Program has been developed in accordance with the requirements of Project Approval 08_0149 Schedule 3 condition 9, and the program approved by DP&I on 27 May 2011. The research programs are continuing with funding and co-operation of Metropolitan Coal.

5.6 Construction Management

[Project Approval 08_0149 Schedule 3 condition 11]

5.6.1 Construction Management Plan

[Project Approval 08_0149 Schedule 3 condition 11]

A Construction Management Plan was prepared for surface construction works (excluding remediation or rehabilitation works) in the Woronora Special Area to satisfy Project Approval 08_0149 Schedule 3 condition 11 and approved by DP&I on 14 November 2011.

Surface construction works in the Woronora Special Area will include the installation, upgrade and maintenance of environmental monitoring equipment (e.g. pluviometers, groundwater bores and gauging stations), access tracks, surface exploration activities (including seismic investigations) and other minor Project-related surface activities

Surface Works Register and Assessment Forms (Construction Management Plan Appendix 1) are completed with detailed specific management measures to be implemented to minimise potential impacts associated with surface construction works, are submitted to DP&I and Sydney Catchment Authority for comment prior to the commencement of works.

2014 - Surface Works Assessment Form was completed and provided to the DP&I and SCA for:

- seismic survey line to run 850m from Fire Road 9I south to the Princess Hwy.

2013 - Surface Works Assessment Forms were completed and provided to the DP&I and SCA for the following:

- three deep groundwater bores (bore 9GGW3, bore F6GW3 and bore F6GW4) installed between October 2012 to September 2013;
- seven upland swamp groundwater bores (Swamp 28 (S28), Swamp 30 (S30), Swamp 33 (S33), Swamp 35 (S35), Bee Creek Swamp, Swamp 137A (S137A), Swamp 137B (S137B) installed in March 2013;
- a Global Navigation Satellite System (GNSS) survey base station (constructed from December 2012 to February 2013); and
- subsidence survey lines (commence in December 2013).

2012 - Surface Works Assessment Forms were completed for:

- a gauging station on the Eastern Tributary (constructed in October 2012); and
- a gauging station on Honeysuckle Creek (constructed in October 2012).

The Construction Management Plan – Performance Indicator Assessment Form (Appendix 2) is used to monitor and assess the performance of the construction works. The Performance Indicator Assessment Form is filled out during and following the completion of construction works.

When the surface disturbance area is no longer being utilised, monitoring is conducted in accordance with the Rehabilitation Management Plan.

5.6.1 Conclusion - Construction Management

The approved Construction Management Plan has been prepared and the requirements implemented for each new construction works undertaken in the Woronora Special Area. The completion of a Surface Works Assessment Form has occurred prior to commencement of any new works during 2012 and 2015.

5.7 Noise[4]

[Project Approval 08_0149 Schedule 4 condition 1 to 8]

5.7.1 Noise Management Plan

[Project Approval 08_0149 Schedule 4 condition 8]

The Noise Management Plan was prepared to satisfy Project Approval 08_0149 Schedule 4 condition 8and approved by DoP on 26 August 2010. The Noise Management Plan was revised to include minor amendments following submission of the 2013 Annual Review/AEMR and inclusion of a real-time noise performance indicator on 25 August 2014. The Noise Management Plan section 9, has a Contingency Plan that would be implemented if noise criteria are considered likely to have been exceeded after the end of 2014.

5.7.2 Commitments in Noise Management Plan

Metropolitan Coal has undertaken upgrades to the major surface facilities and upgrade works are ongoing. One component of the site upgrades of relevance to major surface facilities noise management is the progressive implementation of additional noise controls and noise reduction works at the Surface Facilities Area.

Metropolitan Coal updated the Noise Mitigation Strategy for the site that identifies the key receivers surrounding the Colliery, ranks the contribution of the Colliery noise sources in each receiver area, and determines and evaluates suitable mitigation for the dominant noise sources. As a result of the strategy, cladding of the combined coarse and large coal building were implemented.

Ongoing noise controls and management measures identified in the Noise Management Plan section 6 for the Metropolitan Colliery have been implemented.

[4] John Wasserman, Wilkinson Murray

Table 5.6.2: Noise Management Plan Commitments and Actions

Noise Management Plan Commitment	Metropolitan Coal Action /
CHPP cladding upgrade and internal acoustic absorption	CHPP cladding of the washery with insulation occurred in 2014.
Metropolitan Colliery Project surface construction activities to be generally restricted to daytime hours	Construction works at the Metropolitan surface facilities area is generally restricted to daytime hours.
No off-site road haulage of product coal or coal reject during the evening or night-time periods.	Coal or coal reject is not transported off site by road, outside the hours of 7am and 6pm Monday to Friday.
No truck haulage of coal reject between the CHPP and the temporary stockpile or between the CHPP and the backfill paste plant to be undertaken in the evening and night-time periods.	No coal reject is loaded or transported by truck, between the CHPP and the temporary stockpile or between the CHPP and the backfill paste plant outside the hours of 7am and 6pm Monday to Friday.
Use of broadband reversing alarms on existing and future equipment.	Broadband reversing alarms ('quackers') are fitted to equipment operating at the surface facilities area.
Regular servicing and maintenance of all machinery.	Regular servicing and maintenance of all machinery occurs at the site workshops.
Registering all noise related complaints to identify actions that may be necessary to further reduce noise emissions from the site.	All noise related complaints are entered on the Complaints Register with response and actions taken.

Commitments in the Noise Management have been implemented and ongoing noise controls and management measures are described in Noise Management Plan section.

5.7.3 Environmental Assessment Noise Predictions and Commitments

The Environmental Assessment Appendix J – Noise Impact Assessment concluded:

- The modelling of existing and Metropolitan Coal noise emissions indicates that no privately owned residences would experience an increase in operational noise as a result of the development of the Project described in the Environmental Assessment 2008. Operational noise levels at receivers near the Project boundary to the north are generally predicted to remain unchanged or be slightly reduced due to the contribution of train loading activities which are in close proximity and dominate noise emissions at these locations.
- No significant increases in existing road or rail transport noise or vibration are predicted with the implementation of the Project.
- PRPs under the Metropolitan Colliery Environment Protection Licence 767 condition U1 provide an effective mechanism for progressive improvement of site noise performance. While this noise impact assessment indicates significant noise reduction would occur as a result of the development of the Project, it is recommended that the PRP process is continued to provide a mechanism to identify and implement further noise management or improvement measures that may be practicable over the life of the Project.

Commitments made in relation noise in the Environmental Assessment were:

- Noise monitoring will be conducted for the Project at the monitoring locations, frequencies, parameters and specifications described in the noise PRPs. Noise monitoring will be conducted in accordance with Australian Standard (AS) 1055 – 1997 Acoustics – Description and Measurement of Environmental Noise and the NSW Noise Policy (NSW Environment Protection Authority [EPA], 2000).

- The results of the noise monitoring will be used to optimise noise controls and validate the noise modelling predictions.
- Noise Pollution Reduction Programmes (PRPs) would include:
    - applicable noise criteria from the Project Approval;
    - noise monitoring to be undertaken for the Project (i.e. monitoring locations, frequencies, parameters and specifications);
    - a description of the Project noise mitigation measures; • a protocol for the on-going management of noise at the Metropolitan Colliery, including the PRP process;
    - procedures to be followed in the event of an exceedance of Project Approval noise criteria, should they occur; and
    - complaint response protocols.

The noise commitments in the Environmental Assessment (2008) have been included into the Noise Management Plan and implemented.

5.7.4 Noise Control Measures Implemented by Metropolitan Colliery

Metropolitan Coal has progressively implemented noise controls during the upgrade of the major surface facilities to ensure compliance would be achieved after 2014 in accordance with the requirements of Project Approval Schedule 4 condition 1 and 2.

Noise control assessments have been completed for the Metropolitan Coal activities under the Environment Protection Licence (EPL) Licence No 767, condition G2.1:

- PRP 9 – Noise Assessment Report - to assess noise emissions from the premises in accordance with the INP, and determine if the premises can meet the requirements of the Policy. (Completed 31 October 2004).
- PRP 11 Noise Emission Reduction Program - to identify measures to reduce noise emissions from the premises. (Completed 20 April 2006).
- PRP 12 Noise Investigation and Mitigation Program – to conduct monitoring and computer modelling to assess noise impacts and identify reasonable and feasible noise controls and management measures for the premises. (Completed 31 March 2008).

As a result of the PRPs noise controls and management measures were identified and the noise controls and management measures have been implemented. Noise reduction works undertaken have included:

- Crusher building cladding upgrade. Cladding and absorptive lining fitted to the eastern facade.
- Pumps and compressors. The installation of generic silences.
- Transfer points, chutes and stockyard coal fall. The installation of ‘soft flow chutes’.
- Conveyor Main Drive 1 (MD1) motor and gearbox replaced as part of the expansion project.
- CHPP cladding upgrade. Works completed March 2010 include re-cladding of the northern facade, eastern facade and western facade. These works effectively replaced openings and broken windows with new material and barn doors were installed on the western facade to enable maintenance access.
- Installation of a high performance noise suppressive cladding on two extensions to the CHPP in 2013.
- Cladding and insulation of conveyor motors in the CHPP area.
- Replacement of Front End Loader 988B with a new quieter Front End Loader 988H.
- Installation of audible and visible alarms at each of the train level crossings on site to reduce the use of train horns on site except in emergency situations.

Ongoing noise controls and management measures to minimise noise impact off-site from the surface facilities area are:

- Ongoing CHPP cladding upgrade and internal acoustic absorption;
- Maintenance of previously installed cladding on the CHPP;
- Project surface construction activities to be generally restricted to daytime hours;
- No off-site road haulage of product coal or coal reject during the evening or night-time periods;
- No truck haulage of coal reject between the CHPP and the temporary stockpile or between the CHPP and the backfill paste plant to be undertaken in the evening and night-time periods;
- Use of broadband reversing alarms on existing and future equipment adjusted to meet occupational health and safety (OHS) requirements.

A Noise Mitigation Strategy was developed in 2013 to identify the key receivers surrounding the Colliery, rank the contribution of the Colliery noise sources in each receiver area, and determine and evaluate suitable mitigation for the dominant noise sources.

5.7.5 Rail Noise

[Project Approval Schedule 4 condition 4]

Pacific National is contracted to conduct the freight rail services for Metropolitan Colliery. Correspondence between Ryan Pascoe (Metropolitan Coal) and Shayne Foster (Pacific National) indicates that Metropolitan Coal requested freight locomotives from Pacific National meet the Project Approval requirements in Project Approval Schedule 4 condition 4. The response from Pacific National was that 82 Class locomotives built by Clyde Engineering and approved by NSW EPA in accordance with noise limits L6.1 to L6.4 in RailCorp's EPL (No. 12208) and ARTC's EPL (No. 3142), would be used.

The Noise Management Plan section 8 states Metropolitan Coal *"will use its best endeavours to minimise night - time rail movement on the Metropolitan rail spur, and will liaise with the Community Consultative Committee and the rail service provider to facilitate resolution of rail noise or rail vibration issues that may arise from coal haulage over the life of the Project".*

Metropolitan Coal installed audible and visible alarms at each of the train level crossings on site as part of planned changes coordinated with Pacific National to cease the use of train horns on site except in emergency situations.

The audit concludes that Metropolitan Coal is currently in accordance with Project Approval conditions in Schedule 4 "Specific Environmental Conditions – General" Conditions 4, 5 and 6.

5.7.6 Noise Impact Criteria

[Project Approval 08_0149 Schedule 4 condition 1, 2 and 3]

Project Approval 08_0149 Schedule 4 conditions 1 to 3 state:

"By the end of 2014, the Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 2 at any residence on privately-owned land, or on more than 25% of any privately-owned land."

Table 2: Noise Impact Assessment Criteria

Day	*Evening*	*Night*	*Night*
LAeq(15 min)			*LA1(I min)*
50 dB(A)	*45 dB(A)*	*45 dB(A)*	*50 dB(A)*

"If after 2014, the noise generated by the project exceeds the criteria in Table 3 at any residence on privately-owned land, or on more than 25% of any privately-owned land, then the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 5-7 of schedule 5."

Table 3: Noise Acquisition Criteria

Day	*Evening*	*Night*
LAeq(15 min)		
55 dB(A)	*50 DB(A)*	*50 DB(A)*

"If after 2014, the noise generated by the project exceeds the criteria in Table 4 at any residence on privately-owned land, then the Proponent shall, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the land owner. If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on 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 Director-General for resolution".

Table 4: Additional Noise Mitigation Criteria

Day	*Evening*	*Night*
LAeq(15 min)		
53 dB(A)	*48 dB(A)*	*48 dB(A)*

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2.

5.7.7 Review of Noise Monitoring Results

The Metropolitan Coal 2012, 2013 and 2014 attended and real time monitoring results demonstrated consistent $LA_{eq(15minute)}$ mine-related noise levels for the surveys from March 2012 to December 2014. The attended noise levels recorded at 16 Oxley Place, 53 Parkes Street and 50 Parkes Street were generally consistent as these locations are influenced by continuous noise from the CHPP and conveyors, whereas mine-related noise levels at 36 Old Station Road were more varied as a result of mobile plant such as front end loaders and bulldozers associated with the train loading operations.

The attended $LA_{eq(15minute)}$ monitoring results for the four locations for the September 2012 to December 2013 survey period are summarised are follows:

Attended Noise Monitoring Results September 2012 to December 2013			
	Daytime	**Evening**	**Night time**
16 Oxley Place	51 dBA to 59 dBA	50 dBA to 52 dBA	50 dBA to 52 dBA
53 Parkes Street	52 dBA to 54 dBA	47 dBA to 50 dBA	46 dBA to 48 dBA
50 Parkes Street	47 dBA to 52 dBA	48 dBA to 50 dBA	46 dBA to 50 dBA
36 Old Station Road	44 dBA to 53 dBA	44 dBA to 54 dBA	44 dBA to 53 dBA

Noise Impact Assessment Criteria	50	45	45

The attended $LA_{eq(15minute)}$ monitoring results for the four locations for the March to December 2014 survey period are summarised are follows:

Attended Noise Monitoring Results 2014			
	Daytime	**Evening**	**Night time**
16 Oxley Place	49 dBA to 59 dBA	49 dBA to 50 dBA	49 dBA to 51 dBA
53 Parkes Street	47 dBA to 54 dBA	46 dBA to 48 dBA	46 dBA to 47 dBA
50 Parkes Street	46 dBA to 49 dBA	47 dBA to 49 dBA	47 dBA to 48 dBA
36 Old Station Road	46 dBA to 49 dBA	45 dBA to 48 dBA	44 dBA to 47 dBA
Noise Impact Assessment Criteria	50	45	45

The $LA_{eq(15minute)}$ results for the quarterly surveys of September 2012 to December 2014 indicated the long term mine related noise levels at the monitoring locations have been lowered over this period due to works on the CHPP to upgrade the cladding and reduce the area of openings in the façade. The noise survey conducted in March 2015 indicated that noise levels at the monitoring locations were compliant with the noise impact criteria in Project Approval 08_0149 Schedule 4 condition 1, 2 and 3.

5.7.8 Community Complaints

During the 2013 two complaints relating to operational noise were received by Metropolitan Coal. In response to these complaints, a newly installed conveyor gearbox was fitted with noise attenuation and toolbox talks undertaken with front end loader drivers to minimise equipment noise during loading operations.

In January 2014 one operational noise complaint was received in relation to train loading operations, and use of the train horn. Through toolbox talks, front end loader drivers were reminded to minimise noise during loading operations and new procedures were developed to allow trains to enter the Metropolitan site without using the train horn. The procedures implemented in May 2014 included the installation of audible and visual alarms at train level crossings.

5.7.9 Matters Raised by Relevant Agencies

No specific matters raised by the DP&E/OEH/EPA related to noise from the Metropolitan Coal Project operations.

5.7.10 Conclusion - Noise

The Noise Management Plan was prepared to satisfy Project Approval 08_0149 Schedule 4 condition 8 and approved by DoP on 26 August 2010. The Noise Management Plan was revised to include minor amendments and inclusion of a real-time noise performance monitor on 25 August 2014. The Noise Management Plan section 9, has a Contingency Plan to be implemented if noise criteria are considered likely to have been exceeded after the end of 2014.

The $LA_{eq(15minute)}$ results for the quarterly surveys of September 2012 to December 2014 indicated the long term mine related noise levels at the monitoring locations have been lowered over this period due to works on the CHPP to upgrade the cladding and reduce the area of openings in the façade. The noise survey conducted in March 2015 indicated that noise levels at the monitoring locations were compliant with the noise impact criteria in Project Approval 08_0149 Schedule 4 condition 1, 2 and 3.

5.8 Air Quality[5]

[Project Approval 08_0149 Schedule 4 condition 9 to 13]

5.8.1 Air Quality and Greenhouse Management Plan

[Project Approval 08_0149 Schedule 4 condition 13]

The Air Quality and Greenhouse Gas Management Plan prepared to satisfy Project Approval 08_0149 Schedule 4 condition 13, was approved by DP&I on 14 April 2011.

Management and mitigation measures implemented on the Metropolitan Colliery surface infrastructure area to minimise dust emissions have included:

- Enclosing conveyor systems;
- Operation of water sprays on conveyors, transfer points and stockpile areas;
- Watering of haulage roads and stockpile areas with a water truck when required;
- Progressive sealing of car parks and yard areas, and concreting works adjacent to the washery facility for dust suppression;
- Use of chemical dust suppressant on unsealed haulage roads; and
- Planting of native plants on exposed areas to stabilise soils.

Metropolitan Coal also implemented the following measures to minimise dust emissions associated with off-site coal and coal reject haulage:

- Automatic covers have been fitted to coal reject haulage trucks;
- Automatic or manual covers have been fitted to coal haulage trucks;
- All haulage vehicles are required to pass through a truck wash before leaving the site;
- The mine entrance road is washed five days per week;
- The mine entrance road is scrubbed using a road sweeper and then washed each Saturday; and
- A sweeper/sucker is operated on Parkes Street by Metropolitan Coal four days per week and one day per week by the Wollongong City Council.

5.8.2 Commitments in Air Quality Management Plan

Commitments to manage emissions from the Metropolitan Coal Project activities are generally described in the mitigation and management measures in Air Quality and Greenhouse Gas Management Plan section 9. Metropolitan Coal implemented dust suppression and management measures at the surface facilities including:

- watering of unsealed haul roads and hardstand areas;
- enclosure of crushing and screening processes;
- enclosure of transfer conveyors;
- fixed water sprays located on conveyors and stockpiles (sprays can be operated manually or automatically by interface with a wind speed and direction sensor);
- truck wash for all heavy vehicles travelling off-site;
- progressive sealing of car parks and yard areas; and
- fixed speed limits for all roads around the surface facilities.

The commitments in the Air Quality and Greenhouse Gas Management Plan have been implemented at the surface e facilities area (where the potential for dust generation is greatest).

[5] Gary Graham, Technical Director, SLR

Water sprays on the stockpiles at CHPP to reduce dust generation

Water sprays on product stockpile areas to reduce dust generation

Paved carpark area adjacent to the CHPP (note the clean surface) to reduce dust generation

5.8.3 Environmental Assessment Air Quality Predictions and Commitments

The Environmental Assessment (2008) Air Quality Impact Assessment concluded:

- Maximum 24-hour average PM_{10} concentrations are predicted to be less than 50 µg/m^3 at the nearest residential areas to the north and west of the major surface facilities area. Annual average PM_{10} concentrations for Year 3 are predicted to be less than 5 µg/m^3, at nearest residential areas and TSP concentrations are predicted to be less than 10 µg/m^3.
- Dust deposition at the nearest residential areas is predicted to be less than the 2 g/m^2/month criterion for the project.
- No adverse air quality impacts are expected from the current operations.
- None of the nearest sensitive receptor locations are predicted to experience cumulative concentration of PM_{10}, TSP and dust deposition levels above the air quality assessment criteria. The air quality monitoring program will include a real-time dust monitoring system, to enable site operators to modify activities, as required to minimise dust emissions and off-site impacts during adverse conditions.
- Dispersion modelling to predict off-site dust concentration and dust deposition levels due to the dust generating activities associated with the Metropolitan Colliery showed annual average TSP and PM_{10} concentrations below air quality criteria at the monitored locations.
- Odour levels in the vent shaft outlet are very low. No odour impacts are predicted by dispersion modelling of emissions from the vent shaft in its present or proposed location.
- Greenhouse gas emissions and energy consumption will be reported in accordance with the National Greenhouse and Energy Reporting Act, 2007 (NGER Act).

The air quality predictions in the Environmental Assessment have not been exceeded by the current Metropolitan Coal operations on the surface facilities area.

5.8.4 Air Quality Criteria

[Project Approval 08_0149 Schedule 4 condition 12]

The air quality criteria listed in Project Approval Schedule 4 condition 11 are:

- 50 µg/m^3 for 24-hour PM10 for the Project considered alone;
- 30 µg/m^3 for annual average PM10 due to the Project and other sources;
- 90 µg/m^3 for annual TSP concentrations due to the Project and other sources;
- 2 g/m^2/month for annual average deposition (insoluble solids) due to the Project considered alone; and
- 4 g/m^2/month for annual predicted cumulative deposition (insoluble solids) due to the Project and other sources.

TSP is not measured as part of the monitoring program. In lieu of monitoring TSP it is inferred from PM_{10} measurements using an industry 'rule of thumb' of 40-50% of TSP is PM_{10}.

5.8.5 Air Quality Monitoring

[Project Approval 08_0149 Schedule 4 condition 13]

Monthly dust are collected and analysed for ash and combustible matter at the following sites in accordance with EPL 767 condition P1.1 approved locations 1 to 5 and 11 to 16:

- DG Point 1 - 136 The Crescent (EPA ID No.1);
- DG Point 2 - 28 Old Station Road Helensburgh (EPA ID No. 2);
- DG Point 3 - Mine Manager's Residence Metropolitan Coal (EPA ID No. 3);
- DF Point 4 - Helensburgh Driving Range, 335 Princes Highway (control gauge) (EPA ID No. 4);
- DG Point 5 - 83 Parkes St Helensburgh (EPA ID No. 5)
- DG6 - 59 Parkes Street (EPA ID 11);
- DG7 - 32 Old Station Road (EPA ID No.12);
- DG8 - 88 Parkes Street EPA ID No. 13);
- DG9 - Helensburgh Public School (EPA ID No. 14);
- DG10 - Helensburgh Holy Cross Private School (EPAS ID No. 15);
- 12 Robertson Street Helensburgh (EPA ID No. 16 - HVAS/TEOM unit)

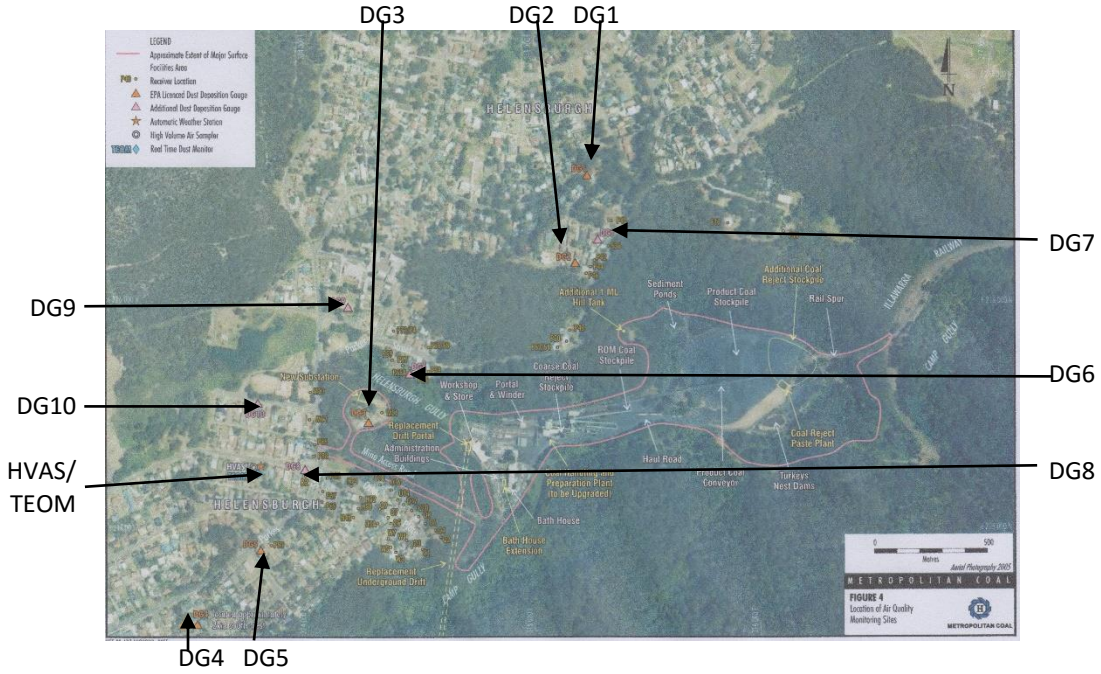


Figure 5.8.5: Dust Gauge Monitoring Locations

The HVAS monitoring occurs generally in accordance with AS 3580.9.6 that requires a HVAS maintenance visit every two months. Whilst there is some degree of flexibility relating to performance due to weekends, the calibration visits have been in excess of the stipulated two month frequency. The calibration records have been examined and found to be in compliance to AS 3580.9.6, including the following critical data:

- Calibration compliance and maintenance;
- Pre calibration sensor check for temperature, pressure and sample flow rate;
- Post calibration sensor check for temperature, pressure and sample flow rate.

5.8.6 Review of Dust Monitoring Results

5.8.6.1 Dust Deposition Gauges

The reported dust deposition results between 2012 and 2014 were compliant with the air quality criteria listed in Project Approval Schedule 4 condition 11. The reported maximum monthly dust deposition rates being:

- 2011/12: 2.0 g/m^2/month at DG 3 & 8
- 2012: 2.2 g/m^2/month at DG8
- 2013: 1.7 g/m^2/month at DG7
- 2014: 2.2 g/m^2/month at DG7

It is noted that the annual average result should be compared against the 4 g/m^2/month criterion. As the monthly maxima do not exceed the criterion it can be assumed that the annual average dust deposition rates results comply with the impact assessment criteria in Project Approval Schedule 4 condition 11.

5.8.6.2 High Volume Air Sampler (PM_{10}) and TEOM

	Annual Average TSP	Annual Average PM_{10}	Maximum 24-hour Average PM_{10}	
	(HVAS PM_{10} → TSP)	HVAS	HVAS	TEOM
2012	35 µg/m^3	14.5 µg/m^3	31.9 µg/m^3	31 µg/m^3
2013	36.3 µg/m^3	14.0 µg/m^3	44.5 µg/m^3	55.4 µg/m^3
2014	36.3 µg/m^3	12.6 µg/m^3 (HVAS) 11.8 µg/m^3 (TEOM)	23 µg/m^3	34.2 µg/m^3

The maximum 24-hour average PM_{10} concentration recorded by the TEOM exceeded the assessment criterion of 50 µg/m^3 on 19 October 2013. It is acknowledged that the increased PM_{10} reading coincided with wide spread NSW bushfires (ref: http://www.emergency.nsw.gov.au/ndd/2013_2014). As such, compliance has not been achieved but this is outside the control of the operator

5.8.7 Matters Raised by Relevant Agencies

No matters related to air quality were raised by the government agencies in relation to the operation of Metropolitan Coal.

5.8.8 Conclusion - Air Quality

The Air Quality and Greenhouse Gas Management Plan prepared to satisfy Project Approval 08_0149 Schedule 4 condition 13, was approved by DP&I on 14 April 2011 and provides satisfactory procedures and mitigation measures to mage dust generation and dispersion from the Metropolitan Coal surface facilities area activities.

The reported dust deposition and PM_{10} monitoring results between 2012 and 2014 were compliant with the air quality criteria listed in Project Approval Schedule 4 condition 11.

5.9 Soil and Water

[Project Approval 08_0149 Schedule 4 condition 14 to 15]

5.9.1 Surface Facilities Water Management Plan

[Project Approval 08_0149 Schedule 4 condition 15]

A Surface Facilities Water Management Plan was prepared in consultation with DWE and DECCW to satisfy Project Approval 08_0149 Schedule 4 condition 15 and approved by DoP on 14 April 2011.

The water management at the surface facilities area and two ventilation sites has been conducted in accordance with the Surface Facilities Water Management Plan section 5. The major surface facilities area is located in a steep-sided valley adjacent to the town of Helensburgh and next to Camp Gully. The site water management system comprises a series of collection dams, sumps and treatment systems. The system is operated to avoid the mixing of clean water runoff and mine water, minimise off site release of site runoff, and to provide water supply requirements on site.

An upgrade of sediment ponds 1, 2 and 3 occurred in April 2013 to increase the holding capacity from 6,000 m^3 to 8,000 m^3. The additional storage capacity provides greater flexibility in the handling of site water, particularly during large storm events.

5.10 Site Water Balance

[Project Approval 08_0149 Schedule 4 condition 15(a)]

Figure 5.9.1 shows a schematic of the major surface facilities water management system, the key features of which are described below.

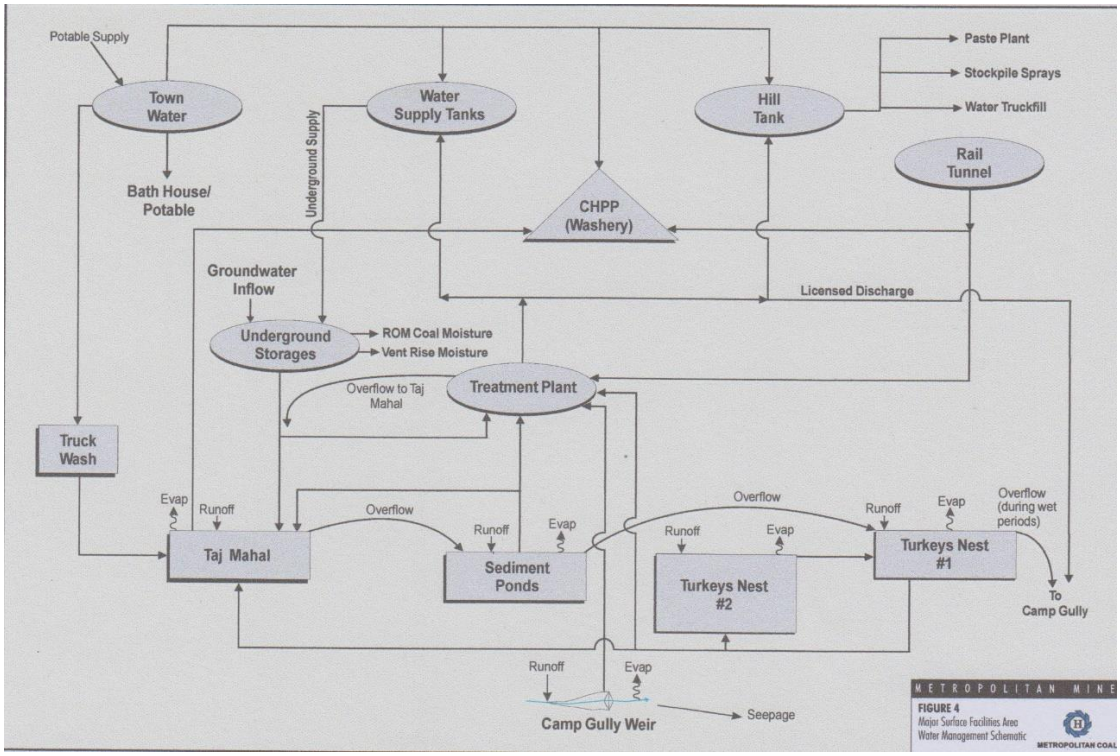


Figure 5.9.1: Schematic of the Major Surface Facilities Water Management System

5.10.1 Site Water Balance

[Project Approval 08_0149 Schedule 4 condition 15(a)]

The site water balance is managed via the water management system that comprises a series of collection dams, sumps and treatment systems. The system is operated to avoid mixing of clean water runoff and mine water, minimise off site release of site runoff and to provide water supply requirements on site.

The main uses of water on site are to supply underground mining operations and for the coal washery. Metropolitan Coal draws its water from three main sources, namely, Camp Gully, the potable town water supply and water captured on site. Water is recycled from underground operations to the Taj Mahal, with some water lost through ventilation. Minimal make-up is produced by mine groundwater inflow as the underground mine is essentially dry.

5.10.2 Mine Water Make

The Surface Facilities Water Management Plan references water balance in relation to:

- The Surface Facilities Water Management Plan section 7.4 states that "*The mine water make water balance has been suitably integrated with the Metropolitan Mine Catchment Monitoring Program and the Metropolitan Mine Long-walls Water Management Plan*"; and the Catchment Monitoring Program section 5.4.4, and Extraction Plan – Water Management Plans section 7.6, include details of the monitoring program to assess mine water make that reflect the monitoring specified in the Surface Facilities Water Management Plan.

- Surface facilities water management schematic and predictive water balance analysis (including underground water make) for average, 10th percentile wet and 10th percentile dry rainfall years (Section 4.1.1 and Table 2). Table 2 indicates that water from underground is predicted to account for approximately 50-56% of inflow to the site.

- Daily mine water make is calculated as difference between measured/estimated inflows and outflows of water from workings. The Surface Facilities Water Management Plan also provides an initial assessment of the water make in the underground mine (estimated to be 0.07 ML/day based on a *"more realistic estimate of ROM coal moisture content of 7%"*). The Annual Reviews assess mine water make from metered water into and out of the underground mine workings, periodic monitoring of moisture content of ventilation air and monitoring of ROM coal moisture content. The Surface Facilities Water Management Plan section 6, Table 7 outlines the performance indicators used to assess whether suitable measures are in place to meet the objectives to minimise water use, control erosion, prevent groundwater contamination, and comply with any surface water discharge limits.

Metropolitan Coal is currently undertaking a comprehensive data gathering project for updating the site water balance model. The Surface Facilities Water Management Plan is planned to be revised during 2015.

5.10.3 Environmental Assessment Site Water Balance Predictions and Commitments

A water balance model of the major surface facilities area water management system was developed for the Metropolitan Coal Mine as part of the Environmental Assessment (2008). The water balance model predicted

the water balance for the life of the Project, system controlled release/overflow rates; and make-up requirements for predicted future production rates (for a range of climatic scenarios).
The site water balance model is used as a forward planning tool and upgraded in accordance with planned and actual water management changes and upgrades to the Metropolitan Coal Project, and is used to assess the effectiveness of planned water management upgrades. The site water balance is monitored and reviewed annually to optimise performance and validate predictions.

5.10.4 Water Sources

5.10.3.1 Site Water Capture

Rainfall and any incidental surface runoff (e.g. from dust suppression activities) is contained by a network of dirty water drains, pits, sediment ponds and dams. Generation of water which comes into contact with the mine or mining processes (referred to as 'site water') is minimised through the design of the site water management system, which includes a network of drains and embankments that divert clean runoff around the surface facilities area.

All site water (including water pumped from the underground mine kings) is pumped to a centralised Water Treatment Plant where it is treated and recycled to assist in meeting operational needs. Excess water may be discharged to Camp Gully (in accordance with EPL 767) if site storages are full. .

5.10.3.2 Camp Gully Water Supply

Camp Gully runs adjacent to the southern edge of Metropolitan Coal's surface facilities area (Figure 9). Camp Gully is an ephemeral, second order stream. Metropolitan Coal's extraction of water from Camp Gully is specifically regulated by the Camp Creek Weir Surface Water Certificate of Title and more generally by the Water Act 1912 and the Water Management Act 2000.

Metropolitan Coal has an annual entitlement under the Camp Gully extraction licence of 130 megalitres (ML), which occurs from the concrete weir constructed on Camp Gully to facilitate the extraction of water for the mine.

Treated water discharges to Camp Gully may occur in accordance with EPL 767 condition P1.3 and M2.3 from licensed discharge points 6 (pipe outlet to Camp Gully), 7 (outlet of the concrete flume from the Water Treatment Plant to Camp Gully) and 8 (overflow from the Turkeys Nest Dam to Camp Gully). Under the EPL licence, monthly monitoring and reporting of pH, Total Suspended Solids and Oil and Grease water quality parameters and total discharge quantities is required.

5.10.3.3 Potable Water

The use of potable water (sourced from Sydney Water) for bathhouses and drinking water and to supplement water supplies for mining purposes when insufficient water is available from Camp Gully and/or on-site harvesting. Use of potable water is recorded and minimised in accordance with the Metropolitan Coal commitments under the Water Savings Action Plan (WSAP). Metropolitan Coal used approximately 388 ML of potable town water (as recorded by the Sydney Water meter) during 2014 and also sourced approximately 77 ML of water from Camp Gully during 2014.

5.10.4 Conclusion - Site Water Balance

A site water balance was developed for the Metropolitan Coal Mine Project as part of the Environmental Assessment (2008) and the water balance model is used as a forward planning tool for the operation of the project. The water balance model is upgraded for any planned and actual water management changes and/or upgrades to the Metropolitan Coal Project. The site water balance is monitored and reviewed annually to optimise water usage and assess performance and validate predictions related to the water management system.

5.11 Water Monitoring[6]

[Project Approval 08_0149 Schedule 4 condition 15]

5.11.1 Surface Water Criteria

[Environment Protection Licence 767 conditions M2.2 and M2.3]

The surface water criteria applicable to the Metropolitan Coal Project are expressed in the Environment Protection Licence No. 767 condition M2.3 for Point 6, 7, and 9.

Pollutant	Unit of Measure	100 %ile conc. limit	Frequency	Sampling Method
Oil and Grease	mg/L	10	Monthly during discharge	Grab sample
pH	pH units	6.5-8.5		
Total Suspended Solids	mg/L	30		

Note: The monitoring at Point 9 required by condition M2 is conducted by the licensee to determine compliance with the limits specified for Points 6 & 7 in condition L2.4.

5.11.2 Surface Water Monitoring

The volume of water discharged from the clean water tank in the Water Treatment Plant to Camp Gully, is continuously monitored in kilolitres per day of water in accordance with EPL No. 767 condition M6.1. The total amount of water discharged from the Water Treatment Plant to Camp Gully has been 2012 – 98 ML; 2013 – 151ML and 2014 - 109 ML.

Monthly surface water quality monitoring for pH, oil and grease and total suspended solids is conducted at EPL No. 767 Point 9 (clean water tank of the Water Treatment Plant). In addition, monthly surface water quality monitoring is conducted at four sites on Camp Gully and event--based sampling is conducted at the Camp Gully sites during major rainfall events (i.e. greater than 25 mm/day) for pH, electrical conductivity (µS/cm), oil and grease, total suspended solids, dissolved oxygen and oxygen reduction potential.

The Metropolitan Coal performance indicator is: "*Surface water discharges comply with the requirements of EPL No. 767".*

Table 5.10.1: Discharge from the Water Treatment Plant to Camp Gully Compliance (Point 9)

Parameter	EPL Criteria	Recorded Range 2012	Recorded Range 2013	Recorded Range 2014
pH	6.5-8.5	7.9-8.5	7.6-8.5	7.8-8.5
Total Suspended Solids	30	<2 – 5	<2 – 4	<2 - 15
Oil and Grease	10	<2 - 5	<2 - 7	<2 - 7

The site water management system continuously monitors total suspended solids and prevents discharge of water that exceeds the EPL criteria. Water that exceeds the criteria is further treated to ensure it meets the acceptable criteria before discharge to Camp Gully.

All water quality discharge criteria (pH, oil and grease, and total suspended solids) were met between August 2011 and 2014.

5.11.3 Water-Related Data Review

A review of Metropolitan Mine's publically available surface water quality data for the analytes of concern at key monitoring sites concluded:

[6] Dr Steve Perrens, Advisian

- the raw data and laboratory reports have been accurately transcribed into spreadsheet form;
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 accurately reflects the raw data; and
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 has been appropriately interpreted.

It is noted that there were some discrepancies in the calculation of the baseline mean plus one standard deviation and the baseline mean plus two standard deviations. These discrepancies resulted in the over reporting of some exceedances of water quality data but did not result in any exceedances not being reported.

5.11.4 Conclusion - Surface Water Monitoring

The review of water quality records required to satisfy EPL 767 criteria indicated a strong focus by Metropolitan Coal on achieving compliance through attention to detail in documentation, excellent record keeping and reporting to authorities. No non-compliances were identified for the water discharged between 2012 and 2015.

Metropolitan Coal's compliance reporting in the Annual Reviews is well organised and complete, and the records required to be made available on the website were available at the time of the audit.

The following observations were made by Evans and Peck in relation to opportunities for improvement of reporting in the Annual Review:

- Future Annual Reviews contain a clear description of the surface facilities water discharge system and monitoring locations. A diagram indicating the location and designation of all discharge points should be included.
- The monitoring frequency of stream flow data being provided by the SCA should be sufficient to ensure the required performance measures (as defined by the Water Management Plan) can be assessed in future Annual Reviews.
- The Annual Reviews contain a section titled "Further Initiatives" for each area of environmental performance. It is recommended that the resolutions of the actions contained in these sections are clearly reported in the subsequent Annual Review.

5.12 Groundwater[7]

[Project Approval 08_0149 Schedule 4 condition 15(b)]

5.12.1 Groundwater Management and Monitoring

Groundwater requirements in the Project Approval 08_0149 conditions are included in:

- Catchment Monitoring Program Project Approval 08_0149 Schedule 3 condition 2 (refer to section 5.2 of this report);
- Extraction Plans including Water Management Plans Project Approval 08_0149 Schedule 3 condition 6 (refer to section 5.3 of this report);
- Surface Facilities Water Management Plan Project Approval 08_0149 Schedule 4 condition 15(b) (refer to section 5.10 of this report).

The main uses of water on site are to supply underground mining operations and the coal washery. Minimal make-up is produced by mine groundwater inflow as the underground mine is essentially dry.

[7] James Tomlin Principal Hydrogeologist, Australasian Groundwater and Environmental Consultants

The inferred mine water make (i.e. groundwater that has seeped into the mine through the strata) can be calculated from the difference between total mine inflows (reticulated water into the mine, moisture in the downcast ventilation, and the in-situ coal moisture content) and total mine outflows (reticulated water out of the mine, moisture in the exhaust ventilation, and moisture in the ROM coal).

5.12.2 Commitments Related to Groundwater

The following documents provide commitments to monitoring and management of groundwater:

- Catchment monitoring program;
- Water management plans within;
    - Extraction Plan for Long-walls 20 to 22;
    - Extraction Plan Long-walls 23 to 27; and
- Biodiversity Management Plan.

The Catchment Monitoring Program summarises baseline hydrogeology data, provides a program to validate the groundwater model and monitor groundwater resources. This document focuses at a regional scale, whilst the Water Management Plans prepared as part of the Extraction Plans intend to provide specific measures for monitoring and management of impacts at the scale of the long-wall panels. The Biodiversity Management Plan focuses on management of the perched swamps and provides monitoring and management measures for these groundwater systems. In reality there is overlap and repetition of commitments between all of these documents.

The Catchment Monitoring Program commits to continually refining the groundwater model as new data becomes available. The commitments, which do not indicate a time frame for completion include:

- developing a local area model for transient calibration of swamp characteristics;
- calibrating the model with shallow time-series groundwater levels, and heads measured in deeper multi-piezometer bores;
- refining the model mesh to match the scale of chain pillars in the mining area; and
- representing near-surface tensile cracking and upland swamps.

The Water Management Plan (April 2014) for Long-walls 23 to 27 describes the groundwater monitoring program which includes:

- monitoring groundwater levels at swamps, shallow and deep groundwater systems on a monthly basis;
- downloading water level measurements from electronic data loggers on a monthly basis;
- comparing the measured groundwater levels with the predicted water levels from the groundwater model every six months; and
- requirement to present the monitoring data and the model verifications within the Annual Review.

The Water Management Plan also provides the following measures of environmental performance relevant to groundwater:

- no connective cracking between the surface and the mine; and
- negligible leakage from the Woronora Reservoir.

The performance measures are assessed using groundwater monitoring data collected from a nominated subset of the monitoring bore network. The nominated bores are located adjacent to the Woronora Reservoir and watercourses to enable hydraulic gradients between the groundwater and the surface waters to be measured. Measured groundwater pressures in deep vibrating wire piezometers are also compared with predictions from the groundwater model, with the results used to indicate the environmental performance of the mine.

The Biodiversity Management Plan addresses the perched sandstone swamps and therefore outlines monitoring of perched groundwater systems around these ecosystems. The Biodiversity Management Plan commits to monitoring groundwater levels and quality through piezometers installed within the swamp substrates and the underlying sandstone. The Biodiversity Management Plan commits to:

- downloading data on a monthly basis;
- comparing the measured data on a six monthly basis against the Performance Indicator and subsidence impact performance measure; and
- installation of equipment to monitor groundwater levels as a component of future Extraction Plan(s) and revisions to the Biodiversity Management Plan.

5.12.3 Environmental Assessment Groundwater Predictions and Commitments

The Environmental Assessment Appendix B -Groundwater Assessment predicted:

- groundwater seepage rates into the long-wall panels of <0.1 to 0.5ML/day;
- rock units within 130 m above the roof of the mined seam will depressurise in response to mining, but the Bald Hill Claystone will retard depressurisation, meaning pressures in shallow and perched aquifers will not be impacted by mining;
- there are very few private water supply bores and none will be impacted by the project; and
- perched water tables are not connected with regional water tables and no loss in base-flow or decline in water levels at swamps will occur.

The commitments in the Environmental Assessment section 6 in relation to groundwater monitoring were superseded in the Preferred Project Report, the Project Approval conditions and the various Water Management Plans. The most recent version of the groundwater model summarised in the Water Management Plan for Long-walls 23-27, has similar predictions to the Environmental Assessment and there are no environmental consequences not previously identified. The Water Management Plan commits to the following performance indicators relating to groundwater:

- visual inspection does not identify abnormal water flow from the goaf, geological structure, or the strata generally;
- 20-day average mine water make does not exceed 2 ML/day;
- significant departure from the predicted envelope of vertical potentiometric head profile at Bore 9GGW2B does not occur;
- water tables measured at Bores 9FGW1A and 9GGW1-80 are higher than the water levels of streams crossed by a transect along Lon-wall 22 (i.e. a hydraulic gradient exists from each bore to the nearest watercourse); and
- groundwater head of Bores 9GGW2B and PM02 is higher than the water level of Woronora Reservoir (i.e. a hydraulic gradient exists from the bores to the Woronora Reservoir).

5.12.4 Groundwater Modelling

A conceptual hydrological model for Metropolitan Coal has been developed that describes the processes governing the movement of water and has been used to consider the effects of long-wall mining and subsidence on water movement processes including the effects of surface and near surface fracturing and changes to strata permeability.

Numerical models have been developed to provide a quantitative understanding of the key hydrological behaviours. Numerical models have been developed in relation to catchment yield and groundwater behaviour. The models are described in the following sections, together with a description of model development, model calibration and validation/verification.

The Catchment Monitoring Program summarises baseline hydrogeology data, provides a program to validate the groundwater model developed for the Metropolitan Coal Project and monitor groundwater resources. This document focuses at a regional scale,

Verifying the model every six months is commended as groundwater models require continuous improvement as new data is obtained. The approach to the modelling has been relatively simple, with complexity building as more data bores available. This approach has predicted the response of the groundwater regime to mining successfully, and mine water make and depressurisation estimates agree are within ranges predicted by the groundwater model.

A significant and good quality environmental dataset has now been collected and a more rigorous transient calibration of the groundwater model using data from the shallow and deep groundwater systems would be of benefit. (Metropolitan Coal is planning this the 2015-2016 period).

The research project, which will use groundwater modelling to investigate the role of chain pillars in retarding depressurisation should be progressed. There is no timeline for this work in the documentation, but it will be of benefit before the preparation of the next Extraction Plan.

5.12.5 Groundwater Monitoring

The approach to groundwater monitoring is sensibly adapted to suit the unique conditions for the:

- perched swamps;
- shallow sandstone systems; and
- deep groundwater systems.

Different monitoring methods are required for each of these groundwater systems. The proponent has utilised electronic data loggers for recording groundwater levels/pressures in the shallow and deep groundwater systems. A proportion of these pressure sensors and data loggers have failed to operate or provide reliable data. This is normal, but it is important all failed electronic loggers are replaced in the shallow bores, as manual measurement of water levels cannot capture the dynamic changes occurring within the shallow groundwater system. The proponent's contractors conducting groundwater monitoring carry additional data loggers and replace any identified as being faulty immediately, an approach which is commended. The vibrating wire arrays in the deep groundwater system have a large number of sensors (up to ten) so failure is less problematic due to sensor redundancy.

The bores installed around the perched swamps monitor the swamp substrate and the surrounding sandstone, and the reporting in the Annual Review/AEMR's use this data to assess the connectivity between the swamps and the Hawkesbury Sandstone. The groundwater data is considered alongside ecological data when the impacts of mining on the swamps is being determined, as required by the Biodiversity Management Plan.
The shallow groundwater systems are monitored with traditional monitoring bores installed into the water table. This is an appropriate approach as these systems, which are connected with and provide base-flow to the water courses in lower reaches of the catchments. The undisturbed and rugged nature of the catchment area above the mine means gaining access for installing monitoring points is challenging; despite this difficulty, the locations and number of monitoring sites installed to date is considered adequate to measure the impact of mining on the shallow groundwater systems and base-flow.

The underground mining is relatively deep and therefore use of vibrating wire pressure sensors is the most appropriate method for measuring depressurisation of the deeper groundwater systems. The vibrating wire pressure arrays contain up to ten sensors in each borehole, which is an impressive technical accomplishment and means depressurisation of the deeper groundwater systems is being measured in significant detail.

The monitoring data collected from all three groundwater systems is representative and is regularly reviewed to determine the impacts of mining on the groundwater system.

5.12.5 Annual Review and Verification

The Annual Reviews describe the results of monitoring the perched swamps, the shallow groundwater system, and the deep groundwater system separately.

The Annual Review compares water levels within swamp substrate and surrounding groundwater levels within sandstones, and comments on groundwater connectivity and flow. Rainfall residual mass curves are also shown on the groundwater level hydrographs, which assists in assessing the water level fluctuations and trends. The Annual Review notes climatic effects and considers some groundwater level fluctuations as a possible response to tension cracks due to mining.

For the shallow groundwater systems, the Annual Review 2014 presents data from:

- three monitoring sites along Waratah Rivulet (WRGW1, WRGW2, and WRGW7);
- one site on Tributary B (RTGW1A); and
- two sites on the Eastern Tributary (ETGW1 and ETGW2).

The Annual Review notes changes in water levels in the shallow groundwater system that can be attributed to climate, and those likely to be due to mining activities. It presents potentiometric heads in the deep groundwater system from the Water Management Plans, dating in some cases back to 2007. This approach is commended, as presenting only a single year of data for the reporting period would make interpreting the data significantly more difficult, particularly where the VWP data has been slow to stabilise over several years. The potentiometric heads profiles indicate that only the deeper strata is depressurised in response to proximal mining, with no obvious impacts on shallow groundwater. This observed response is consistent with the Environmental Assessment predictions.

The Performance Indicators designed to detect connective cracking and loss of base-flow are all discussed in the Annual Review, and the project is complying with the commitments. The proponent correctly concludes that the numerical model is overestimating the depressurisation in the deep groundwater system and the connective cracking is not more extensive than outlined within the Environmental Assessment. The potentiometric head profiles do not indicate any loss of shallow groundwater or base-flow to the water courses and Woronora Reservoir. These are valid conclusions based on the data available.

5.11.6 Matters Raised by Relevant Agencies

No response was received from consultation with the agencies related to groundwater.

5.11.7 Conclusion - Groundwater

The information reviewed in this independent audit indicates the impact of the project on the groundwater regime is within the bounds of the impacts predicted by the Environmental Assessment and subsequent updates to the groundwater model.

The proponent has developed the management plans required by the Project Approval and is complying with the commitments made within these plans. The management plans require frequent monitoring of groundwater levels/quality, and six monthly verification of the groundwater model. This level of rigour is appropriate given the sensitive nature of the project area. The environmental performance of the project with regards to groundwater management is considered to be of a very high standard, particularly given the onerous nature of the approval conditions.

5.13 Erosion and Sediment Control

[Project Approval 08_0149 Schedule 4 condition 15(b)]

5.13.1 Erosion and Sediment Control Plan

[Project Approval 08_0149 Schedule 4 condition 15(b)]

Erosion and Sediment Management is addressed in several of the management plans developed for the Metropolitan Coal activities (e.g. Construction Management Plan section 6.3; Surface Facilities Water Management Plan section 8.2; Water Management Plan section 8.2; Biodiversity Management Plan section 8.2; Land Management Plan section 8 Tables 7 and 8;

Temporary erosion and sediment controls (e.g. silt fences and sediment control structures) are installed as required prior to the commencement of surface disturbance activities. Erosion and sediment control measures are designed generally in accordance with *Managing Urban Stormwater: Soils and Construction*, Volume 2E Mines and Quarries DECC 2008. An Erosion and Sediment Control Plan is prepared and attached to the Surface Works Assessment Form where required. Erosion and sediment controls remain in place until the disturbed ground is stabilised.

5.13.2 Erosion and Sediment Control Monitoring/Management

Routine inspections are conducted to check the integrity and effectiveness of erosion control measures at the Major Surface Facilities Area and at the Ventilation Shafts. Particular attention is paid to perimeter areas and batters of the product coal stockpile area.

If erosion controls are compromised or if visible erosion is detected, management and/or mitigation measures are implemented as soon as practicable. Erosion controls are designed in accordance with *Managing Urban Stormwater: Soils and Construction Volume 2E Mines and Quarries (*DECCW 2008).

Subsidence impact monitoring of cliffs and overhangs, steep slopes, and land in general, occurs to assess the potential environmental consequences of the subsidence on any areas of erosion that have the potential to impact surface water quality through loss of sediment in runoff.

Regular visual monitoring for stream bank erosion (particularly along Waratah Rivulet) is conducted to identify areas subject to excessive erosion and sediment loss. If monitoring indicates the potential for excessive erosion or sediment migration, specific mitigation measures will be implemented in accordance with the Long-wall 23-27 Water Management Plan.

Management measures include:

- filling of cracks and minor erosion holes in the bed or banks of watercourses;
- installation of sediment fences downslope of subsidence-induced erosion areas;
- stabilisation of erosion areas using rock or other appropriate materials;
- stabilisation of banks subject to soil slumping; and • implementation of vegetation management measures.

The Metropolitan Coal Performance Indicator for erosion is: "*Inspections of the major surface facilities area and ventilation shaft(s) indicate the measures implemented are effectively controlling erosion".*

During 2012 and 2015, specific erosion and sediment controls were implemented for the upgrade of the Turkeys Nest Dam including installation of sediment fences and hydro-mulching of the dam wall.

Weekly inspections of the major surface facilities area and ventilation shaft(s) indicate that the erosion control measures implemented during the reporting period have effectively controlled erosion.

No major cracking of exposed bedrock areas (including areas where water flow was evident) or swamp sediments was observed during the visual inspections by Metropolitan Coal of Swamps 16/17, 18, 23, 24, 25 and 26 between 2012 and 2015. No areas of erosion (with the exception of Fire Road 9C where heavy rain had previously scoured the roadside, as reported in the 2012 Annual Review), changes in water colour or changes in vegetation condition (e.g. unusual vegetation dieback) were observed between 2012 and 2015.

This performance indicator was not exceeded during 2014.

5.13.3 Matters Raised by Relevant Agencies

No matters related to erosion and sediment control were raised by agencies.

5.13.4 Conclusions - Erosion and Sediment Control

The management of erosion and sediment control on the Metropolitan Coal surface facilities area and the areas of the Woronora Special Area where potential subsidence impacts may or have occurred, is assessed and managed in accordance with the various Extraction Plans, Water Management Plans, and Biodiversity Management Plans developed for the project. The visual inspections conducted during this audit confirmed that Metropolitan Coal procedures and mitigation measures were satisfactorily managing surface runoff from disturbed areas and controlling loss of sediment to the environment.

5.14 Transport

[Project Approval 08_0149 Schedule 4 condition 17 to 22]

5.14.1 Traffic Management Plan

[Project Approval 08_0149 Schedule 4 condition 22]

The Traffic Management Plan was prepared to satisfy Project Approval 08_0149 Schedule 4 condition 22 in consultation with the RTA, Wollongong City Council, local schools and the Community Consultative Committee and submitted to the Director-General and approved on 14 April 2011.

The primary aim of the Traffic Management Plan is to minimise the traffic impacts of the project on the residential areas and schools within Helensburgh.

A Transport Management Plan prepared for the Project and includes the following management measures:

- public road haulage of coal reject at the existing Metropolitan Colliery maximum annual haulage levels;
- maintenance of the existing level of product coal haulage;
- maintenance of the existing Metropolitan Colliery heavy vehicle night-time curfew (i.e. large vehicle access to the site is restricted during night-time hours);

- measures to work with suppliers to minimise the use of heavy vehicles for the delivery of small items to the Major Surface Facilities Area that could be delivered via a light vehicle or van, where practicable;
- measures to encourage the mine operational workforce and Project construction workforce to car-pool and minimise workforce related light vehicle movements to the site;
- liaison with RailCorp to minimise Project night-time train movements as far as practicable within train scheduling restraints;
- liaison with the Metropolitan Colliery CRG and RailCorp to facilitate the resolution of any particular rail noise or vibration issues (e.g. on-site train whistle noise) that may arise with respect to on-site or off-site rail haulage noise or vibration, as required; and
- access to the Woronora Special Area by HCPL staff and contractors will be undertaken in accordance with SCA requirements (e.g. conditions of entry, speed limits etc).

5.14.2 Commitments in Transport Management Plan

The Environmental Assessment (2008) presented the following commitments:

Commitments	Action / Comments
Road Maintenance Contributions - Consult with relevant councils and DoP regarding contributions payable.	The requirement for Road Maintenance Contributions is addressed in Project Approval Schedule 4 condition 18: *'From the end of 2009, the Proponent shall make a suitable annual contribution to WCC, WSC, and CC for the maintenance of local roads that are used as haulage routes by the project. If there is any dispute over the amount of the contribution, the matter must be referred to the Director-General for resolution."*
Product Coal Trucking Tonnages - monitor off-site coal haulage tonnages above 100,000 tonnes, and limit additional coal trucking if necessary to meet the Project Approval limit of 120,000 tonnes.	Metropolitan Coal monitors the amount of coal and coal reject transported from the site by road and rail each year, and the results are reported on the website. Product coal transport from the site to the Corrimal and Coalcliff Coke Works ceased with closure of the coke works in 2014. Approximately 15% of the ROM coal processed in the CHPP is separated to the coal reject streams. CHPP coal reject material is transported from the Metropolitan Colliery site by truck to the Glenlee Washery.

5.14.3 Transport Monitoring

[Project Approval 08_0149 Schedule 4 condition 21]

The amount of coal and coal reject material that is transported from the Metropolitan Colliery site by road and by rail each year is monitored in accordance with Project Approval 08_0149 Schedule 4 condition 21.

Coal and coal reject deliveries are weighed on receipt at their destination (e.g. Port Kembla, Glenlee Washery) and the delivered tonnages are reported back to Helensburgh Coal Pty Ltd (HCPL).

The ROM coal extracted per annum has not exceeded the production rate of 3.2 million tonnes in a calendar year between 2001 and 2015. Extraction rates are reported in the Annual Reviews/AEMR's in section 2.

5.13.4 Conclusion – Transport

The transport of ROM coal from the Metropolitan Colliery by rail to Port Kembla and by road to local customers (i.e. Corrimal and Coalcliff Coke Works) did not exceed the approved production rate of 3.2 million tonnes in a calendar year, between 2001 and 2015. Road transport of product coal to the Corrimal and Coalcliff Coke

Works ceased in 2014 with closure of the coke works. All product coal is currently transported by rail. Extraction rates are reported in the Annual Reviews/AEMR's in section 2.

Approximately 15% of the ROM coal processed in the CHPP is separated to the coal reject streams. The majority of this coal reject material is transported from the Metropolitan Colliery site by truck to the Glenlee Washery.

5.15 Rehabilitation

[Project Approval 08_0149 Schedule 6 condition 1 to 4]

5.15.1 Rehabilitation Strategy – Surface Facilities Area

[Project Approval 08_0149 Schedule 6 condition 2]

A Rehabilitation Strategy for Metropolitan Coal was prepared in October 2011 in consultation with relevant stakeholders by a team of suitably qualified experts endorsed by the Director-General, to satisfy Project Approval 08_0149 Schedule 6 condition 2.

The Rehabilitation Strategy was developed as a framework document that describes the development rehabilitation objectives and completion criteria for the future land-use of the surface facilities area following the completion of mining activities.

The rehabilitation strategy describes future land-use options for the mine (Section 4), the rehabilitation objectives and strategy for the mine (Section 5) and provides proposed completion criteria for the mine (Section 6).

The Rehabilitation Strategy will be regularly reviewed and revised as necessary following consultation with relevant stakeholders, outcomes of rehabilitation trials and changes to rehabilitation guidelines and policies.

5.15.2 Rehabilitation Management Plan

[Project Approval 08_0149 Schedule 6 condition 4]

A Rehabilitation Management Plan for the project was originally prepared by Metropolitan Coal in May 2010. The Rehabilitation Management Plan has been progressively updated to satisfy Project Approval 08_0149 Schedule 6 condition 4 in consultation with various government stakeholders, with the most recent revision (RMP-R01-E being approved by DTIRIS DRE on 22 May 2014. The Rehabilitation Management Plan describes the rehabilitation objectives and performance indicators in accordance with Project Approval 08_0149 Schedule 6 condition 1.

5.15.3 Rehabilitation Objectives

[Project Approval 08_0149 Schedule 6 condition 1]

Project Approval 08_0149 Schedule 6 condition 1 outlines the rehabilitation objectives required to be met, to the satisfaction of the Director- General.

Table 5.14.2: Rehabilitation Objectives

(Table 11: Rehabilitation Objective Project Approval 08_0149 Schedule 6 condition 1)

Domain	Rehabilitation objective
Surface Facilities Area	Comply with the Rehabilitation Strategy for the surface facilities area determined in Schedule 6

Domain	Rehabilitation objective
Waratah Rivulet (between downstream edge of Flat Rock Swamp and full supply level of the Woronora Reservoir); **Eastern Tributary** (between main gate of Long-wall 26 and full supply level of the Woronora Reservoir).	Restore surface flow and pool holding capacity as soon as reasonably practicable
Cliffs	Ensure that there is no safety hazard beyond that existing prior to mining
Other land affected by the project	Restore ecosystem function, including maintaining or establishing self-sustaining native ecosystems: • comprised of local native plant species; • with a landform consistent with the surrounding environment
Built features	Repair/restore to pre-mining condition or equivalent
Community	Minimise the adverse socio-economic effects associated with mine closure including the reduction in local and regional employment. Ensure public safety

5.15.4 Status of Rehabilitation Objectives - Assessment

[Project Approval 08_0149 Schedule 6 condition 1]

Activities related to the rehabilitation objectives are reported in the Annual Reviews:

Domain	Rehabilitation Actions
Surface Facilities Area	No action in the surface facilities area as the whole area is still active for coal handling and transport.
Waratah Rivulet (between downstream edge of Flat Rock Swamp and full supply level of the Woronora Reservoir); and **Eastern Tributary** (between main gate of Long-wall 26 and full supply level of the Woronora Reservoir).	Annual Review reports on Waratah Rivulet rehabilitation actions: • Stream remediation is initiated if water in a pool ceases to overflow except as a result of climactic conditions. • The performance indicator for successfully achieving the desired outcome for the Waratah Rivulet is to "*restore surface flow and pool holding capacity as soon as reasonably practicable*". • 2012 - stream remediation activities commenced at Pools A and F on the Waratah Rivulet. • 2013 - no stream remediation activities were conducted on the Waratah Rivulet as access via Fire Road 9H was restricted by the SCA. Continuous Improvement Study commissioned to assess the efficacy of the stream remediation methodology and the study considered the remediation works conducted to be functional. • 2014 - stream remediation activities commenced at Pool F in June 2014. Stream remediation activities at Flat Rock Crossing (Pools G and G1), planned to commence in May 2015. Inspections during this audit verified stream remediation actions.

Domain	Rehabilitation Actions
 **Location of Stream Bed Rehabilitation on Waratah Rivulet (WRS3)**	 **Stream Bed Rehabilitation on Waratah Rivulet (WRS3)**
Cliffs	2014 Annual Review notes that a small area of rock fall (0.5 m^3) was observed at Cliff OH2 in the 2013 Annual Reporti. No additional instabilities have been observed in 2014-2015. Remediation of this small rock fall has not been necessary.
 **Section of Overhang at Cliff OH2 where Rock Fall Occurred along Waratah Rivulet above LW20 (downstream from Flat Rock Crossing)**	 **Fallen Section of Overhang from Cliff OH2 adjacent to West side of Waratah Rivulet above LW20 (downstream from Flat Rock Crossing)**
Other land affected by the project	Monitoring of ecosystem function and landform occurs in accordance with the Biodiversity Management Plans. The assessment of restoration of ecosystem function, including maintaining or establishing self-sustaining native ecosystems comprised of local native plant species and a landform consistent with the surrounding will be recorded in the Rehabilitation Management Plan – Surface Disturbance Register and the progress of rehabilitation will be reported in future Annual Review and AEMR/Rehabilitation Reports.
Built features	Noted: Repair/restore built features to pre-mining condition or equivalent – not yet applicable
Community	Noted: not applicable until mine closure

5.15.5 Environmental Assessment Predictions and Commitments

The Environmental Assessment addresses a project rehabilitation program that would include the progressive rehabilitation of the surface disturbance areas and the rehabilitation of surface disturbance areas remaining at the cessation of the Project (e.g. the Metropolitan Colliery Major Surface Facilities Area).

Further, rehabilitation may be undertaken to remediate mine subsidence effects (e.g. surface cracking and erosion) on other natural surface features.

The Mining Operations Plan for the Metropolitan Colliery will provide information in regard to the mining, processing and rehabilitation operations, and describe:

- area(s) to be disturbed;
- mining, rehabilitation and remediation method(s) to be used;
- progressive rehabilitation schedules;
- areas of particular environmental sensitivity;
- land and water management systems; and
- resource recovery.

The Rehabilitation Strategy – Surface Facilities Area, Rehabilitation Management Plan, and Mining Operations Plan have been prepared for the Metropolitan Coal operations and activities and address the commitments in the Environment al Assessment and Project Approval conditions.

5.15.6 Rehabilitation Measures / Practices

Rehabilitation objectives in Project Approval Schedule 6 condition 1 requires that the surface flows and pool storage function downstream of Flat Rock Crossing on the Waratah Rivulet shall be restored in the event of impact from the mining activities.

Measures implemented to rehabilitate and/or remediate impacts associated with surface activities in the underground mining area and surrounds and impacts associated with subsidence on stream pools and rock bars, are described in the Rehabilitation Management Plan (section 7) and the detailed management plans prepared for the Extraction Plan Long-walls 20-22 and Long-walls 23-27 (Water Management Plan, Biodiversity Management Plan, Land Management Plan, Heritage Management Plan, Built Features Management Plan and Public Safety Management Plan).

Fracture characterisation activities implemented at rock bars requiring remediation and stream grouting techniques are conducted on the Waratah Rivulet and Eastern Tributary occurs as described in Rehabilitation Management Plan (section 7.2). Environmental management measures implemented during the conduct of the stream remediation activities are described in section 7.2.8 and monitoring of stream remediation measures in relation to meeting performance indicators are outlined in section 8.2.2. A Rehabilitation Management Plan – Stream Remediation Register will be used to manage the implementation of stream remediation measures.

PUR injection campaigns have been conducted every six months at Pools A and F for approximately 4 years. Assessment of the effectiveness of the grout to restore surface flows, pond function and pond level recession rates during low flow periods to pre-mining impacts is on-going, and appears to be effective at this stage based on observed pool level recovery since the grouting works.
Further PUR grouting works for Pools G and G1 are proposed to commence in May 2015 after successful completion of Pool F.

5.15.7 Rehabilitation Progress

[Project Approval 08_0149 Schedule 6 condition 1]

The areas potentially affected by subsidence in the underground mining area and surrounds (including the Woronora Special Area) are continuously monitored in accordance with the Extraction Plans and rehabilitation / remediation of streams or pools is occurring under the procedures/processes described in the Rehabilitation Management Plan.

Rehabilitation of the Metropolitan Coal mine site and mining area will form a greater focus of the ongoing compliance of Metropolitan Coal in future Annual Reviews and Independent Environmental Audits, as mining activities are completed, the land surface stabilises following subsidence, and rehabilitation of surface features affected by the mining process.

5.15.8 Annual Review

The Annual Review provides a summary of the land disturbed and rehabilitation progress annually during the period 1 January to 31 December. The rehabilitation summary indicates the Mine Lease Area is approximately 6,125ha of which 17ha is disturbed by the surface infrastructure facilities. Small areas of maintenance rehabilitation occurred between 2012 and 2015 involving active planting of native vegetation (primarily around the boundary of the site) and the removal or control of introduced species and weed species. The rehabilitation zones around the surface facilities area are shown in the Annual Review Figure 28. It was observed during the site inspection that the planting of over 7,300 plants during 2012 and 2013 and weed management has retained a dense vegetative screen around the Metropolitan Colliery boundary in Helensburgh.

5.15.9 Matters Raised by Relevant Agencies

No matter related to rehabilitation of the surface facilities area were raised in consultation with the government agencies.

5.15.10 Conclusion - Rehabilitation

A Rehabilitation Strategy was developed as a framework document that describes the development rehabilitation objectives and completion criteria for the future land-use of the surface facilities area following the completion of mining activities.

A Rehabilitation Management Plan (RMP-R01-E being approved by DTIRIS DRE on 22 May 2014) describes the rehabilitation objectives and performance indicators to be met in accordance with Project Approval 08_0149 Schedule 6 condition 1.

Metropolitan Coal is operating in a manner consistent with the Project Approval 08_0149 condition rehabilitation requirements.

5.16 Offsets

[Project Approval 08_0149 Schedule 6 condition 5 and 6]

Project Approval 08_0149 Schedule 6 condition 6 states:

> *"If the Proponent exceeds the performance measures in Table 1 of this approval, and either*
>
> *(a) the contingency measures implemented by the Proponent have failed to remediate the impact; or*
>
> *(b) the Director-General determines that it is not reasonable or feasible to remediate the impact, then the Proponent shall provide a suitable offset to compensate for the impact to the satisfaction of the Director-General."*

The monitoring of the areas identified in Project Approval 08_0149 Schedule 6 condition 1 - Table 11 between August 2011 and December 2014 has not indicated the exceedance of any performance measure set by Metropolitan Coal for assessment of the status of each Domain. In relation to monitoring of Waratah Rivulet all pools except Pool G remained above their cease to flow levels during the reporting period. Stream remediation

activities undertaken at Pools A and F on the Waratah Rivulet have been undertaken and as the rock bars at Pools A and F are considered to largely control the pools located upstream of these rock bars the restoration of surface flow and pool holding capacity at Pools A and F are expected to restore the surface flow and pool holding capacity of pools between Flat Rock Swamp and Pool F.

The mitigation measures undertaken by Metropolitan Coal are considered to have remediated the identified impact at Pools A and F on the Waratah Rivulet, so no offset is currently considered to be required.

The monitoring of each Domain will continue to ensure that any exceedance of performance indicators / measures, are identified and management and mitigation measures are implemented to meet the rehabilitation objectives in Table 11.

5.16.1 Conclusions - Offsets

The monitoring of the areas identified in Project Approval 08_0149 Schedule 6 condition 1 - Table 11 between August 2011 and December 2014 has not indicated the exceedance of any performance measure set by Metropolitan Coal for assessment of the status of each Domain.

The remediation measures undertaken by Metropolitan Coal to address the impact identified at Pools A and F on the Waratah Rivulet, are considered to have mitigated the identified impact at Pools A and F, so no offset is currently considered to be required.

5.17 Annual Review and Verification

The following Annual Reviews prepared for the Metropolitan Coal Project between 1 August 2011 and 31 December 2014 have addressed the requirements of Project Approval Schedule 7 condition 2:

- Annual Review 1 August 2011 to 31 July 2012;
- Annual Review and Annual Environmental Management Report 1 August 2012 to 31 December 2013
- Annual Review and Annual Environmental Management Report/Rehabilitation Report 1 January 2014 to 31 December 2014

[Note: The Annual Environmental Management Report/Rehabilitation Report is required under the Consolidated Coal Lease 703 condition 3 and Mining Lease 1702.]

The Annual Reviews provide a comprehensive summary of all environmental management and performance for the surface facilities area of the Metropolitan Coal Project and the underground mining area and surrounds for each environmental aspect and monitoring program, providing:

- Assessment of Environmental Performance; and
- Management and Mitigation Measures.

The Independent Environmental Audit reviewed each Annual Review and verified the reported summary information for each environmental aspect in relation to the operation and activities at the Metropolitan Coal Project site and documentation.

It is concluded that the Annual Reviews are a true and accurate summary of the status of the Metropolitan Coal Project environmental status for each of the reporting periods.

5.18 Community Complaints

The protocol for the management and reporting of complaints was developed in the Environmental Management Strategy section 6.2.

For each complaint, the following information will be recorded in the complaints register:

- date and time of complaint;
- method by which the complaint was made;
- personal details of the complainant which were provided by the complainant;
- nature of the complaint;
- the action(s) taken by Metropolitan Coal in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by Metropolitan Coal, the reason why no action was taken

A dedicated telephone number for the provision of comments or complaints is maintained by Metropolitan Coal (1800 115 003) and is displayed on signage at an entrance to the mine.

During the August 2011 to May 2015 period complaints received were:

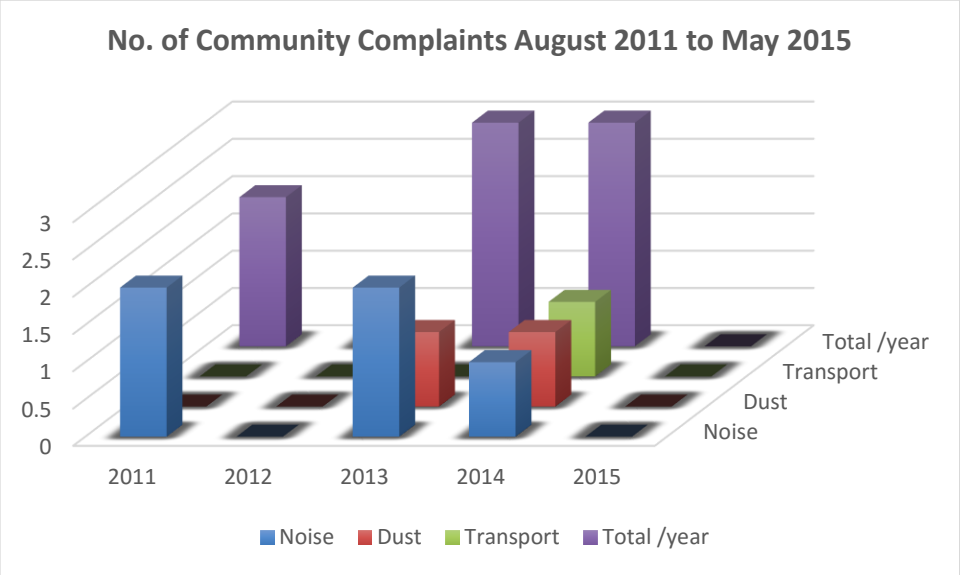
2011 - two complaints were received, related to operational noise (29 October 2011 noise from drift fan – new drift fan installed; 23 December 2011 noise from truck revving to run a pump)

2012 – No complaints

2013 - three complaints were received, two relating to operational noise and one relating to dust (21 January 2013 dust complaint; 25 February 2013 noise complaint – conveyor gear box had attenuation fitted; 17 April 2013 noise from train loading operations).

2014 – two complaints were received, one complaint relating to dust and noise (15 January 2014 regarding noise from train operations in early morning) and one complaint (20 January 2014 relating to off-site trucking of coal reject outside of normal hours).

2015 – No complaints received between January and May 2015.



The small number of community complaints received between August 2011 and May 2015 were handled by Metropolitan Coal in accordance with the protocol for the management and reporting of complaints developed in the Environmental Management Strategy.

6. Conclusions and Recommendations

This Independent Environmental Audit conducted by Trevor Brown & Associates in May 2015 indicates that the Metropolitan Coal is generally operating in compliance with Project Approval 08_0173, Environment Protection Licence 767 and Consolidated Mining Lease CML 2, conditions of approval.

Recommendations / Observations resulting from the independent Environmental Audit are:

Recommendation – Research Program:
It is recommended that the Research Program Significance of Chain Pillars on Simulated Groundwater Pressures Project Approval 08_0149 Schedule 3 condition 9 be progressed before the preparation of the next Extraction Plan

Recommendation – Biodiversity
It is recommended that should Littlejohn's Tree Frog be recorded in either the Spring of Autumn surveys for the project the Biodiversity Management Plan be amended to include a program specific to this species which would include winter survey and monitoring (i.e. targeted assessment and monitoring during the period of the species greatest activity).

Subsidence Reporting Observations - Valley Closure Measurement Data:
There are a few minor issues with the subsidence assessments to-date that could be clarified during the next reporting period, in regards to the reporting of measured v. predicted valley closure parameters:
(i) The end-of-panel reports present the measured Net Vertical Movement and the Upsidence only. Assuming that the Subsidence = Net Vertical Movement + Upsidence it is unclear how the Upsidence is measured without estimates of Subsidence at a given location.
(ii) The compressive strains associated with valley closure mechanism have been shown graphically in the review reports, but are not compared to predictions in the Tables in the text.
(iii) It is also unclear why survey accuracy would decrease from +/-20 mm to +/-50 mm outside the limits of extraction. It is considered more likely that the apparent increase in subsidence is related to the elastic compression of the strata and coal seam under abutment loading conditions

Attachments

Appendix 1	Water-Related Data Review Report
Attachment A	Project Approval 08_0149 Conditions
Attachment B	Extraction Plan Long-walls 23-27 Approval Conditions
Attachment C	Environmental Protection Licence 767 Conditions
Attachment D	Consolidated Coal Lease 703 Environmental Conditions
Attachment E	Mining Lease 1610 Environmental Conditions

Advisian

WorleyParsons Group

Metropolitan Coal Pty Ltd

Metropolitan Mine

Surface Water Environmental Audit

November 2015

Version Control

Revision	Date	Author	Reviewed by	Comments
0.1	May 2015	Alison Tourle/ Lisa Granqvist	Steve Perrens	Preliminary draft
0.2	November 2015	Lisa Granqvist	Steve Perrens	Final

Advisian
WorleyParsons Group

List of Abbreviations

AEMR	Annual Environmental Management Report
ANZECC	Australian and New Zealand Environment and Conservation Council
AR	Annual Review
CoA	Minister's Condition of Approval
CCC	Community Consultative Committee
CMP	Catchment Monitoring Program
DECC	Department of Environment and climate change
DoI	Department of Industries
DP&I	Department of Planning and Infrastructure
DP&E	Department of Planning and Environment (formerly DP&I)
DRE	Department of Resources and Energy
EP	Extraction Plan
EPA	NSW Environment Protection Authority
EPL	Environmental Protection Licence
EP&A Act	Environmental Planning and Assessment Act 1979
HCPL	Helensburgh Coal Pty Limited
I&I NSW	Industry & Investment NSW
MCoA	Minister's Conditions of Approval
ML	Mining Lease
MOP	Mine Operations Plan
LW20-22 WMP	Longwalls 20-22 Water Management Plan
LW23-27 WMP	Longwalls 23-27 Water Management Plan
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
RMP	Rehabilitation Management Plan
RS	Rehabilitation Strategy
SCA	Sydney Catchment Authority
SFWMP	Surface Facilities Water Management Plan
SoC	Statement of Commitments
TSS	Total Suspended Solids
WCC	Wollongong City Council
WMP	Water Management Plan

Advisian
WorleyParsons Group

Table of Contents

Annexures

Advisian

WorleyParsons Group

1 Surface Water Audit Details

1.1 Background

Metropolitan Mine is an underground mine which extracts coal by longwall mining from an area located within the catchment of Woronora Reservoir. Coal is conveyed by conveyor to pit-top facilities located in the township of Helensburgh in the southern coalfields of NSW, approximately 50 kilometres south of Sydney. Founded in 1888, Metropolitan Mine is Australia's oldest continually operating coal mine.

Metropolitan Coal is a wholly owned subsidiary of Peabody Energy Australia Pty Ltd. Metropolitan Coal was granted approval for the Metropolitan Coal Project (the Project) under Section 75J of the *New South Wales Environmental Planning and Assessment Act, 1979* (EP&A Act) on 22 June 2009. The following modifications to the Approval have been approved by the Director-General of the Department of Planning & Infrastructure (DP&I) under Section 75W of the EP&A Act:

- Mod 1 (September 2010) – to construct a replacement underground drift, including construction of a new drift portal at the mine's Major Surface Facilities Area;
- Mod 2 (July 2011) – relating to the amount of product coal to be trucked off-site and the number of truck departures for product coal and coal reject; and
- Mod 3 (October 2013) – to consolidate the annual environmental reporting requirements under the Project Approval and the Mining Lease and Consolidated Coal Lease conditions.

The Project comprises the continuation, upgrade and extension of underground coal mining operations and surface facilities at Metropolitan Coal Mine. The mine produces coking coal, the majority of which is transported by train to Port Kembla for shipping to domestic and overseas customers. A small proportion of the coal is also transported by truck to Coalcliff and Corrimal Coke Works.

1.2 Audit Objectives

Condition 8 of Schedule 7 of the Project Approval requires an Independent Environmental Audit to be undertaken to assess environmental performance of the project:

"By end of December 2011, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:

(a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General;

(b) include consultation with the relevant agencies;

(c) assess the environmental (surface water aspects) performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);

(d) review the adequacy of surface water strategies, plans or programs required under these approvals; if appropriate; and

(e) recommend measures or actions to improve the environmental (surface water) performance of the project, and/or any assessment, plan or program required under these approvals."

This independent environmental audit has been undertaken on behalf of Metropolitan Coal to fulfil the objective of meeting the requirements of parts c), d) and e) of Condition 8, Schedule 7.

1.3 Audit Criteria

The criteria against which the audit was undertaken (presented in the Audit Checklist in Appendix A) consists of the relevant surface water aspects of the conditions and requirements of:

- the Minister's Conditions of Approval (CoA);
- the Environment Protection Licence (EPL) #767 conditions;
- the Mining Lease(ML) #703 conditions;
- the Statement of Commitments (SoC) identified in Metropolitan Coal Project – Environmental Assessment (EA) (Resource Strategies, date) and the Metropolitan Coal Project – Preferred Project Report (PPR) (Peabody, May 2009); and
- Longwalls 23-27 Extraction Plan Approval.

1.4 Audit Scope

This audit provides a review of the surface water related aspects of the Project presented in the following documents:

- Metropolitan Coal - Longwalls 20 - 22: Water Management Plan (Revision WMP-R01-C, DP&I approval 14 Nov 2011);
- Metropolitan Coal - Longwalls 23 - 27: Water Management Plan (Revision WMP-R01-C, DP&I approval 9 April 2014);
- Metropolitan Mine - Catchment Monitoring Plan (Revision CMP-R01-E, DP&E approval 25 August 2014);
- Metropolitan Mine - Surface Facilities Water Management Plan (Revision SFWMP-R01-C, DP&I approval 14 April 2011);
- Metropolitan Mine - Longwalls 20 - 22: Extraction Plan (Revision EP-R01-A, DP&I approval 14 May 2011);
- Metropolitan Mine - Longwalls 23 - 27: Extraction Plan (Revision EP-R01-B, DP&I approval 9 April 2014);
- Metropolitan Coal - Longwalls 20 - 22: Subsidence Monitoring Program (Revision SMP-R01-D, DP&I approval 14 Nov 2011);
- Metropolitan Coal - Longwalls 23 - 27: Subsidence Monitoring Program (Revision SMP-R01-B, DP&I approval 9 April 2014);
- Metropolitan Coal - Environmental Management Strategy (Revision A1, DP&I approval 14 Nov 2011);
- Metropolitan Mine - Rehabilitation Management Plan (Revision RMP-R01-E, 22 May 2014);

- Metropolitan Coal - Rehabilitation Strategy (Revision RS-R01-A, dated October 2011);
- Metropolitan Coal - 2012 Annual Review (Project No. MET-08-08/8.1 Document No. 00482778);
- Metropolitan Coal – 2013 Annual Review and Annual Environmental Management Report (Project No. MET-08-08/8.1, Document No. 00581658);
- Metropolitan Coal – 2014 Annual Review and Annual Environmental Management Report (Project No. MET-08-08/8.1, Document No. 00666550);
- Metropolitan Collieries Annual Return (01-Jan-2011 to 31-Dec-2011, accepted by EPA on 4 April 2013);
- Metropolitan Collieries Annual Return (01-Jan-2012 to 31-Dec-2012, accepted by EPA on 2 June 2014); and
- Metropolitan Collieries Annual Return (01-Jan-2013 to 31-Dec-2013).

In addition, the Department of Planning & Environment (DP&E) has requested that a detailed review to verify the publically available water quality monitoring data be included in the 2015 independent environmental audit scope of works. The objective of this review is "to provide further confidence to the relevant Government agencies and the community that the mine is appropriately recording and monitoring its environmental impacts." The detailed review is provided in Annexure B and summarised in Section 2.3.

1.5 Audit Team

The audit was led by Dr Steve Perrens of Advisian. Dr Perrens is an environmental engineer with over 40 years' experience in consulting and applied research related to water resource assessment and auditing, engineering hydrology and natural resource management. Dr Perrens was assisted by Alison Tourle and Lisa Granqvist.

Advisian would like to acknowledge the cooperation of Metropolitan Coal's personnel in providing access to all documentation requested during the audit.

1.6 Site Visit

The audit included a meeting with Metropolitan Coal site environmental staff and an inspection of the pit top facilities and sections the catchments and watercourses of Waratah Rivulet and the Eastern Tributary. The meeting and inspections were carried out on 7 May 2015. Photographs from the site visit are provided below.

Location of Stream Bed Rehabilitation on Macquarie Rivulet (WRS3)

Stream Bed Rehabilitation on Macquarie Rivulet (WRS3)

Surface Facilities – Sediment Dam

Surface Facilities – Turkeys Nest Dam

Surface Facilities – Dust Suppression

2 Audit Findings

The Audit Checklist in Appendix A presents a summary of the supporting evidence of compliance identified from the documents listed in Section 1.4, discussions with Metropolitan Coal environmental staff and the site inspection.

The compliance status for the approval documents listed in Section 1.3 is provided in Section 2.1 below. Section 2.2 identifies a number of aspects where there are opportunities for improvements in the management and reporting for the Project to improve the environmental outcomes of the Project.

2.1 Compliance Status

The Audit Checklist identifies the degree of compliance with each criterion using the following terminology.

Status	Description
Compliant (C)	Adequacy and appropriateness of implementation against the Project Approval Conditions, EPL Conditions, ML conditions or compliance with commitment made.
Compliant Ongoing (CO)	The intent and specific requirements of the condition have been met and the requirements are ongoing for the operation of Austar Coal Mine.
Non-Compliant (NC)	The intent or one or more specific requirements of the condition have not been met and is environmentally significant.
Administrative Non-compliance (A)	A technical non-conformance with a condition of the consent that would not result in material harm to the environment
Not active / Not applicable (N/A)	Condition or requirement has an activation or requirement that had not been triggered at the time of the review, therefore a determination of compliance could not be made.
Noted (N)	Conditions that are statements of requirement but not auditable.

2.1.1 Conditions of Approval

The audit did not identify any non-compliances with surface water related conditions of approval. Administrative non-compliances (ie an issue that would not result in material harm to the environment) identified are summarised below.

Condition 1, Schedule 3: "Negligible reduction in the quantity of water resources reaching the Woronora Reservoir"
The EP Water Management Plans (LW20-22 WMP Table 20 and LW23-27 WMP Table 19) specify that the data analysis to assess against performance indicators will include analysis on a 6 monthly basis. The 2012 and 2013 Annual Reviews contains analysis in accordance with the WMP (AR2012, Section 3.3.3.1, p 58 and AR2013, Section 3.3.3.1, p 77) except there is no evidence that the analysis was carried out on a 6 monthly basis.
In addition, analysis was not undertaken in the 2014 Annual Review, as a review by Gilbert & Associates has indicated that there are some discrepancies in flows generated using the SCA's current rating curves. Re-calibrated catchment models will be developed for the gauging stations in the next reporting period. Additionally, as described in the Metropolitan Coal Catchment Monitoring Program, catchment models will be developed for the Eastern Tributary and Honeysuckle Creek gauging stations once a suitable period of data has been collected (AR2014, Section 3.3.3.2, pp 62-63).
Condition 1, Schedule 3: "Negligible reduction to the quality of water resources reaching the Woronora Reservoir"
The EP Water Management Plans (LW20-22 WMP Table 20 and LW23-27 WMP Table 19) specify that the performance indicator will be considered to have been exceeded if data analysis indicates that the sliding 12 month mean for any water quality parameter exceeds the baseline mean plus one standard deviation and there was not a similar increase in the same measure at the control site. The performance indicator was exceeded in the 2012, 2013 and 2014 Annual Reviews. However, the performance measure was not exceeded. (AR2012, Section 3.3.3.2, pp60-80; AR2013, Section 3.3.3.2, pp 81-96; AR2014, Section 3.3.4.2, pp89-104).
Condition 1, Schedule 3: "Negligible reduction in the water quality of Woronora Reservoir"
The EP Water Management Plans (LW20-22 WMP Table 20 and LW23-27 WMP Table 19) specify that the performance indicator will be considered to have been exceeded if data analysis indicates that the sliding 12 month mean for any water quality parameter exceeds the baseline mean plus one standard deviation and there was not a similar increase in the same measure at the control site. The performance indicator was exceeded in the 2012 Annual Review. However, the performance measure was not exceeded (AR2012, Section 3.3.3.5, pp86-95).
Condition 1, Schedule 3: "Negligible environmental consequences (that is, no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining and minimal gas releases) for the Waratah Rivulet between the full supply level of the Woronora Reservoir and the maingate of Longwall 23 (upstream of Pool P)"
The EP Water Management Plans (LW20-22 WMP Table 20 and LW23-27 WMP Table 19) specify that the indicator will be considered to have been exceeded if gas releases are observed at Pool P on the Waratah Rivulet. Intermittent bubbles were noted in the 2014 Annual Review. However, the performance measure was not exceeded (AR2014, Section 3.3.4.6, pp 130-135).

2.1.2 Environment Protection Licence

The audit did not identify any non-compliances with surface water related conditions of EPL 767. Administrative non-compliances identified are summarised below.

Condition M1.3: Monitoring Records
With respect to water quality samples, the EPL requires the time at which a sample is collected and the name of the person who collected the sample to be recorded. These details were not visible on the Excel monitoring records or laboratory analytical report provided.

2.1.3 Mining Lease Conditions

The audit did not identify any non-compliances with the surface water related mining lease conditions of approval.

2.1.4 Statement of Commitments

The audit did not identify any non-compliances with the surface water related statement of commitments. Administrative non-compliances identified are summarised below.

Waratah Rivulet Management Plan (WRMP): "The WRMP will comprise the following elements: identification of evaluation zones where an adaptive management approach will be implemented"
Adaptive management is referenced as a management and contingency measure in LW20-22 WMP (Table 20, pp 82-84 and Section 9, pp 108-109) and LW23-27 WMP (Table 19, pp 97-103 and Section 9, pp 128-129), but there is no reference to the specific evaluation zones where adaptive management will be applied.
Surface Water Monitoring: "The following will be incorporated in the Project EMP: storage characteristics (volume versus level) and cease to flow levels of all monitored pools will be determined by survey."
Storage characteristics not specifically addressed in the WMP.
Site Water Balance: "The site water balance will be monitored and reviewed annually to optimise performance and validate predictions"
The SWMP (which includes the site water balance) is reviewed within 3 months of submission of the Annual Review, an incident report or an audit (SFWMP, Section 2, p 5). However, the water balance has not been revised or updated to date - the mine has been undertaking significant works as part of an expansion project, and as such any revisions to the water balance would quickly be made redundant. As these expansion works are nearing completion, Metropolitan Coal is currently undertaking a comprehensive data gathering project with the aim of updating the current SFWMP and site water balance model. The SFWMP is scheduled to be revised in June 2015 [Management Plan and Monitoring Program Revision table sighted].

2.1.5 Longwalls 23-27 Extraction Plan Approval

The audit did not identify any non-compliances with the surface water related Longwalls 23-27 Extraction Plan conditions of approval.

2.1.6 Standards, Codes and Guidelines

The surface water related aspects of the CoA do not require compliance with any specified standards, codes or guidelines. Furthermore, the WMP, SFWMP and CMP do not reference any standards, codes or guidelines with which the Project is required to comply.

EPL Condition M3.2 "*Testing Methods – Concentration Limits*" requires monitoring for the concentration of pollutants to be undertaken in accordance with the Approved Methods Publication. Metropolitan Coal complies with the requirements of the "*Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales*". Refer to EPL Audit Checklist Item No. 7 in Appendix A.

The Environmental Assessment for the Project requires Metropolitan Coal to comply with the Australian and New Zealand Environment and Conservation Council (ANZECC) *Guidelines for Fresh and Marine Water Quality* (2000). This guideline includes default 'trigger values' for water quality for ecosystem protection to be used in the absence of site specific data. The guidelines also set out monitoring and analysis protocols to be used in circumstances where greater attention needs to be given to site specific conditions. The extensive and detailed monitoring of water quality in the watercourses draining to Woronora Reservoir is considered to adequately address the requirements of this guideline.

2.2 Adequacy of Strategies, Plans and Programs

Part d) of Condition 8, Schedule 7 requires the Independent Environmental Audit to review the adequacy of surface water strategies, plans and programs.

Given the DP&E has approved the current versions of the WMP, SFWMP and CMP it has been assumed that these surface water plans and programs satisfy the relevant conditions and requirements. Nonetheless, the audit has identified a number of Opportunities for Improvement associated with the surface water strategies, plans or programs, as set out below.

2.3 Verification of Water Quality Monitoring Data

Annexure B to the 2015 Independent Environmental Audit provides the detailed review of Metropolitan Mine's publically available surface water quality data carried out as part of the audit process.

The review has found that, for the analytes of concern at key monitoring sites:

- the raw data and laboratory reports have been accurately transcribed into spreadsheet form;
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 accurately reflects the raw data; and
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 has been appropriately interpreted.

It is noted that there were some discrepancies in the calculation of the baseline mean plus one standard deviation and the baseline mean plus two standard deviations. These discrepancies resulted in the over reporting of some exceedances of water quality data but did not result in any exceedances not being reported.

Refer to Annexure B for further details.

2.4 Other Opportunities for Improvement

Several observations made during the audit present opportunities for improvement including:

- It is recommended that all future Annual Reviews contain a clear description of the surface facilities water discharge system and monitoring locations. A diagram indicating the location and designation of all discharge points should be included. (See Appendix A, EPL L1.3).
- It is recommended that Metropolitan Coal address the issue of monitoring frequency of stream flow data being provided by the SCA to ensure the required performance measures (as defined by the WMP) can be assessed in future Annual Reviews. If this is not possible, the WMP should be amended accordingly. (See Appendix A, Schedule 3, Condition 1).
- The Annual Reviews contain a section titled “Further Initiatives” for each area of environmental performance. It is recommended that the resolutions of the actions contained in these sections are clearly reported in the subsequent Annual Review.

3 Conclusion

The review of compliance records required to satisfy the audit criteria indicated a strong focus by Metropolitan Coal on achieving compliance through attention to detail in documentation, excellent record keeping and reporting to authorities. No non-compliances which would result in material harm to the environment were identified.

Metropolitan Coal's compliance reporting in the Annual Reviews was well organised and complete, and the records required to be made available on the website were available at the time of the audit. Metropolitan Coal has demonstrated a commendable level of compliance. Notwithstanding, several opportunities for clarification and improvement have been identified.

Annexure A

Surface Water Audit Checklist

Advisian

WorleyParsons Group

Table of Contents

1 Minister's Conditions of Approval

Item		Summary of requirement	Compliance status*	Evidence of implementation
CoA: Schedule 3 - Specific Environmental Conditions – Mining				
1	Condition 1 Watercourses	The Proponent shall ensure that the project does not cause any exceedances of the following subsidence impact performance measures:	C	Relevant performance indicators and measures are included in the EP WMPs: - LW20-22 WMP, Table 20, pp 82-83 (approved by DP&I on 14 November 2011 [Approval Sighted]). - LW23-27 WMP, Table 19, pp 97-103 (approved by DP&I on 15 April 2014 [Approval Sighted]).
		• Negligible reduction to the quantity of water resources reaching the Woronora Reservoir.	CO N	• Monitoring of Environmental Consequences: was undertaken in accordance with the EP WMPs: - AR2012: Section 3.3.2, p 41. - AR2013: Section 3.3.2, p 60. - AR2014: Monitoring stated in Section 3.3.2.2, p 59. However charts showing recorded streamflow hydrographs and flow duration curves are not presented (due to reasons stated below).
			A	• Data Analysis to Assess against Performance Indicators: - AR2012: the analysis was undertaken in accordance with the LW20-22 WMP (AR2012, Section 3.3.3.1, p 58) except there is no evidence that the analysis was carried out on a 6 monthly basis (as per WMP, Table 20, p78). - AR2013: the analysis was undertaken in accordance with the LW20-22 WMP (AR2013, Section 3.3.3.1, p 77) except there is no evidence that the analysis was carried out on a 6 monthly basis (as per WMP, Table 20, p78). Additionally, it was noted in AR2014 p 116 that the AR2013 assessment of quantity of water resources reaching the Woronora River used a 1 year sliding mean rather than 1 year sliding median. - AR2014: A review by Gilbert & Associates has indicated that there are some discrepancies in flows generated using the SCA's current rating curves. Re-calibrated catchment models will be developed for the gauging stations in the next reporting period. Additionally, as described in the Metropolitan Coal Catchment Monitoring Program, catchment models will be developed for the Eastern Tributary and Honeysuckle Creek gauging stations once a suitable period of data has been collected (AR2014, Section 3.3.3.2, pp 62-63).

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

Item	Summary of requirement	Compliance status*	Evidence of implementation
		CO	• Assessment of performance indicator/s: - AR2012: performance indicator/s was not exceeded in 2011 (AR2012, Section 3.3.3.1, p59). - AR2013: performance indicator/s was not exceeded in 2011 (AR2013, Section 3.3.3.1, p79). - AR2014: A review by Gilbert & Associates indicated that there are some discrepancies in flows generated using the SCA's current rating curves. Re-calibrated catchment models will be developed for the gauging stations in the next reporting period (AR2014, Section 3.3.5.1, p 117). Catchment models will be developed for the Eastern Tributary and Honeysuckle Creek gauging stations once a suitable period of data has been collected (AR2014, Section 3.3.3.2, p 63).
		N	
		CO	• Assessment of performance measure was not required, as performance indicators were not exceeded.
	• Negligible reduction to the quality of water resources reaching the Woronora Reservoir.	CO	• Monitoring of Environmental Consequences was undertaken in accordance with the EP WMPs: - AR2012, Section 3.3.2, pp 42-45. - AR2013, Section 3.3.2, pp 61-64. - AR2014, Section 3.3.2.4, pp 59-60, 68-69; Section 3.3.3.4, pp 68-69; Charts 33-38, pp 90-92; and Charts 63-66, pp 119-120).
		N	Note: Site ETWQ2 in the LW20-22 WMP is shown as ETWQU in WMP Figure 26 and referred to as ETWQU in the ARs.
		A	• Data Analysis to Assess against Performance Indicators: The assessment of the performance indicators was undertaken in accordance with the EP WMPs (as per LW20-22 WMP, Table 20, p78 or LW23-27 WMP, Table 19, p97), with the exception that there is no evidence that the analysis was carried out on a quarterly basis: - AR2012, Section 3.3.3.2, pp 60-71. - AR2013, Section 3.3.3.2, pp 80-92. - AR2014, Section 3.3.4.2, pp 89-103; Section 3.3.5.2, pp 118-122).
		A	• Assessment of performance indicator/s: - AR2012: The performance indicator was exceeded - the sliding 12 month means for dissolved aluminium, dissolved iron and dissolved manganese at site WRWQ9 exceeded the baseline mean plus one standard deviation during the review period, and that because there were not similar exceedances of the same measure at the control site,

Item	Summary of requirement	Compliance status*	Evidence of implementation
			(AR2012, Section 3.3.3.2, pp 60-71). - AR2013: The performance indicator was exceeded - the sliding 12 month means for dissolved aluminium, and dissolved iron at site WRWQ9 exceeded the baseline mean plus one standard deviation during the reporting period and that because there were not similar exceedances of the same measure at the control site (AR2013, Section 3.3.3.2, pp 81-92). - AR2014: LW20-22 WMP (ETWQ2 and WRWQ9): The performance indicator was exceeded - the sliding 12 month means for dissolved iron and dissolved manganese at site WRWQ9 and the sliding12 month mean for dissolved manganese at site ETWQ2 exceeded the baseline mean plus one standard deviation during the review period, and that because there were no similar exceedances of the same measure at the control site (AR2014, Section 3.3.4.2, pp 89-103). LW23-27 WMP (ETWQ AU): The performance indicators were not exceeded in 2014 (AR2014, Section 3.3.5.2, pp118-122).
		CO	• Assessment of performance measure: - AR2012: assessment of performance measure undertaken in accordance with LW20-22WMP (AR2012, Section 3.3.3.2, pp 71-79) and concluded that the performance measure was not exceeded. Metropolitan Coal also commissioned an independent review of the performance indicator exceedance, as required by the LW20-22 WMP (Table 20, p82). The peer review concluded that the performance measure was not exceeded (AR2013, p80). - AR2013: assessment of performance measure undertaken in accordance with LW20-22WMP (AR2013, Section 3.3.3.2, pp 92-94) and concluded that the performance measure was not exceeded. Metropolitan Coal also commissioned an independent review of the performance indicator exceedance, as required by the LW20-22 WMP (Table 20, p82). The peer review concluded that the performance measure was not exceeded (AR2013, p96). - AR2014: assessment of performance measure (at WRWQ9 and ETWQ2) undertaken in accordance with LW20-22WMP and LW23-27 WMP (AR2014, Section 3.3.4.2, pp 103-104) and concluded that the performance measure was not exceeded. The performance indicator was not exceeded for dissolved iron, dissolved aluminium and dissolved manganese at site ETWQ AU during the reporting period (AR2014, p123).
	• Negligible reduction in the water quality of Woronora Reservoir.	CO	• Monitoring of Environmental Consequences was undertaken in accordance with the EP WMPs:

Item	Summary of requirement	Compliance status*	Evidence of implementation
			- AR2012 (Section 3.3.3.5, p 86). - AR2013 (Section 3.3.3.5, p 103). - AR2014 (Section 3.3.4.5, p 110).
		N	The frequency of water quality sampling undertaken by SCA is unclear.
		CO	• Data Analysis to Assess against Performance Indicators was undertaken in accordance with the EP WMPs: - AR2012 (Section 3.3.3.5, pp 86-87). - AR2013 (Section 3.3.3.5, pp 103-104). - AR2014 (Section 3.3.4.5, p 110).
		N	• No evidence that the analysis was carried out on a quarterly basis (in accordance with LW20-22 WMP, Table 20 or LW23-27 WMP, Table 19).
		A	• Assessment of performance indicator/s: - AR2012: The performance indicator was exceeded - the 12 month moving average total manganese concentration exceeded the baseline mean plus 1 standard deviation criterion and there was not a similar exceedance at the control site in the Nepean Reservoir (AR2012, Section 3.3.3.5, pp86-93).
		CO	- AR2013: The performance indicator was not exceeded during the reporting period (AR2013, Section 3.3.3.5, pp 104-109).
		CO	- AR2014: The performance indicator was not exceeded during the reporting period (AR2014, Section 3.3.5.5, pp 126-130).
		CO	• Assessment of performance measure: - AR2012: Assessment of performance measure undertaken in accordance with the LW20-22 WMP (AR2012, pp 93–95) and concluded that the performance measure was not exceeded. Metropolitan Coal also commissioned an independent review of the performance indicator exceedance, as required by the LW20-22 WMP (Table 20, p84). The peer review concluded that the performance measure was not exceeded (AR2013, p103). - AR2013: Assessment of performance measure was not required, as performance indicators were not exceeded.
			- AR2013: Assessment of performance measure was not required, as performance indicators were not exceeded.
	• Negligible environmental consequences (that is, no diversion of flows, no change in the	N/A	• Monitoring of Environmental Consequences: - AR2012: Monitoring was not undertaken, as at the end of the review period mining had

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

Item	Summary of requirement	Compliance status*	Evidence of implementation
	natural drainage behaviour of pools, minimal iron staining and minimal gas releases) for the Waratah Rivulet between the full supply level of the Woronora Reservoir and the maingate of Longwall 23 (upstream of Pool P).	CO	not advanced to within 400 m of Pool P, and subsidence at Pool P was not greater than 20mm/month. Pool P water levels were provided (Section 3.3.3.6, pp 96-98). - AR2013: Monitoring was undertaken in accordance with the EP WMPs (Section 3.3.3.6, pp 109-114). Subsidence at Pool P was not greater than 20 mm/month during the reporting period. Notwithstanding, weekly visual inspections of Pool P were undertaken from August to December 2013.
		CO	- AR2014: Monitoring was undertaken in accordance with the EP WMPs (Section 3.3.4.6, pp 130-135). Subsidence at Pool P was not greater than 20 mm/month during the reporting period. Notwithstanding, opportunistic visual observations were also conducted by Metropolitan Coal during the reporting period [Sample Pool P Observations sighted].
		N/A	• Data Analysis to Assess against Performance Indicators: - AR2012: Data analysis was not undertaken, as at the end of the review period mining had not advanced to within 400 m of Pool P, and subsidence at Pool P had not been greater than 20mm/month. Pool P water levels have been provided (Section 3.3.3.6, pp 96-98). - AR2013: Data analysis was undertaken in accordance with the EP WMPs (Section 3.3.3.6, pp 109-114).
		CO	- AR2014: Data analysis was undertaken in accordance with the EP WMPs (Section 3.3.4.6, pp 130-135).
		N/A	• Assessment of performance indicator/s: - AR2012: Assessment of performance indicators was not undertaken, as at the end of the review period mining had not advanced to within 400 m of Pool P, and subsidence at Pool P had not been greater than 20mm/month. Assessment against the performance indicators will be undertaken in future annual reviews (Section 3.3.3.6, pp 96-98).
		CO	- AR2013: The performance indicators were not exceeded during the reporting period (Section 3.3.3.6, pp 109-114).
		A	- AR2014: The performance indicators were not exceeded during the reporting period, with the exception that intermittent bubbles, approximately 50 m from the top of the pool, were observed in February 2014 (Section 3.3.4.6, pp 130-135).
		N/A	• Assessment of performance measure: - AR2012: Assessment of performance measure was not undertaken, as at the end of the review period mining had not advanced to within 400 m of Pool P, and subsidence at Pool P had not been greater than 20mm/month. Assessment against the performance

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

Item	Summary of requirement	Compliance status*	Evidence of implementation
		CO CO	measures will be undertaken in future annual reviews (Section 3.3.3.6, pp 96-98). - AR2013: The performance indicators were not exceeded during the reporting period (Section 3.3.3.6, pp 109-114). - AR2014: Metropolitan Coal commissioned an independent assessment of the Pool P gas release, which concluded that the gas releases were considered to be minimal. As required by the LW20-22 WMP (Table 20, p86) and LW23-27 WMP (Table 19, p101), Metropolitan Coal commissioned a peer review of the assessment, which concluded that the performance measure was not exceeded (AR2014, p134).
	• Negligible environmental consequences over at least 70% of the stream length (that is no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining and minimal gas releases) for Eastern Tributary between the full supply level of the Woronora Reservoir and the maingate of Longwall 26.	N/A N/A CO N	• Monitoring of Environmental Consequences: - AR2012: Not applicable to Longwalls 20-22 (AR2012, Table 21, p57). - AR2013: Not applicable to Longwalls 20-22 (AR2013, Table 27, p76). - AR2014: Monitoring was undertaken in accordance with the LW23-27 WMP (Section 3.3.5.7, pp 135-138). During the reporting period, the mining of Longwall 23 had not advanced to within 400 m of Pools ETAF to ETAU
		N/A N/A CO N	• Data Analysis to Assess against Performance Indicators - AR2012: Not applicable to Longwalls 20-22 (AR2012, Table 21, p57). - AR2013: Not applicable to Longwalls 20-22 (AR2013, Table 27, p76). - AR2014: Data analysis was undertaken in accordance with the LW23-27 WMP (Section 3.3.5.7, pp 135-138). During the reporting period, the mining of Longwall 23 had not advanced to within 400 m of Pools ETAF to ETAU.
		N/A N/A CO	• Assessment of performance indicator/s: - AR2012: Not applicable to Longwalls 20-22 (AR2012, Table 21, p57). - AR2013: Not applicable to Longwalls 20-22 (AR2013, Table 27, p76). - AR2014: The performance indicators were not exceeded during the reporting period (Section 3.3.5.7, pp 137-138)
		N/A N/A CO	• Assessment of performance measure: - AR2012: Not applicable to Longwalls 20-22 (AR2012, Table 21, p57). - AR2013: Not applicable to Longwalls 20-22 (AR2013, Table 27, p76). - AR2014: The performance indicators were not exceeded during the reporting period (Section 3.3.5.7, pp 137-138)

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

	Item	Summary of requirement	Compliance status*	Evidence of implementation
2	Condition 2 Catchment Monitoring Program	The Proponent shall prepare and implement a comprehensive Catchment Monitoring Program for the project to the satisfaction of the D-G. This program must:	C	Details below.
		a) be prepared by suitably qualified and experienced experts whose appointment has been endorsed by the D-G;	C	CMP prepared by Gilbert and Associates, Heritage Computing (HCPL) and Metropolitan Coal. These experts were endorsed by DP&I on 19 February 2010 [Approval Sighted].
		b) be prepared in consultation with DWE, SCA and DECC;	C	The document Revision Status Register notes that rev CMP-R01-A of the CMP was distributed to the SCA, DECCW, NSW Office of Water and DP&I.
		c) be approved by the D-G before the Proponent is allowed to carry out any second workings in the mining area; and	C	CMP-R01-E approved by DP&E on 25 August 2014 [Approval Sighted].
		d) include: • detailed baseline data of the existing surface water resources in the project area;	C	CMP-R01-E, Section 3.4, pp 11 – 29: includes baseline data on surface water flow at Waratah Rivulet, Woronora River and O'Hares Creek and key water quality parameters for selected sites on the Waratah Rivulet, Eastern Tributary, Far-Eastern Tributary, Woronora River, Bee Creek, Honeysuckle Creek and Woronora Reservoir at the time of CMP development
		• a program for the ongoing development and use of appropriate surface water model for the project; and	C	CMP-R01-E, Section 4.3, pp 62 – 65: a numerical catchment model for the Waratah Rivulet and control catchment(s) have been developed using the AWBM.
		• a program to: - monitor and assess any impacts of the project on the quantity and quality of surface water resources in the project area, and in particular the catchment yield to the Woronora Reservoir; and - validate and calibrate the surface water model.	C	• CMP-R01-E, Section 5.3, pp73-76: includes details of future monitoring for surface water flow, pool water levels, stream water quality and water quality of Woronora and Nepean Reservoir. • CMP-R01-E, Section 4.3.2, p 66: Catchment yield model development, calibration and verification program.
3	Condition 6 (f) Extraction Plan	The Proponent shall prepare and implement an Extraction Plan for all second workings in the mining area to the satisfaction of the Director-General. This plan must: (f) include a Water Management Plan, which has been prepared in consultation with DECC, SCA and	C	The LW20-22 EP was approved by DP&I on 14 May 2010, including sub-plan WMP Rev B [Approval Sighted]. LW20-22 WMP Rev C was approved on 14 Nov 2011 [Approval Sighted]. The document Revision Status Register notes that LW20-22 WMP Rev A was distributed to the SCA, DECCW and DoI. Subsequent revisions LW20-22 WMP Rev B addressed comments by the SCA; LW20-22 WMP Rev C addressed comments by the SCA and NOW and review/revision

	Item	Summary of requirement	Compliance status*	Evidence of implementation
		DWE, to manage the environmental consequences of the Extraction Plan on watercourses (including the Woronora Reservoir), aquifers and catchment yield.		following submission of 2010 Annual Review. The LW23-27 EP was approved by DP&I on 9 April 2014 [Approval Sighted. The LW23-27 WMP Rev C was approved on 9 April 2014 [Approval Sighted]. The document Revision Status Register notes that LW23-27 Rev A and Rev B was distributed to the DP&I, SCA, OEH and NOW. Rev C addressed comments from the DP&I and SCA, and was distributed to these parties.
4	Condition 7 Contingency planning	The Proponent shall ensure that the Water Management Plan required under condition 6(f) includes: a) a program to collect sufficient baseline data for future Extraction Plans;	C	A surface water quality monitoring program to collect baseline data for future extraction plans are provided in the EP WMPs: • LW20-22 WMP, Section 11, pp 111-112. • LW23-27 WMP, Section 11, pp 132-133.
		b) a revised assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this approval;	C	A revised assessment of potential environmental consequences of the Extraction Plan are provided in the EP WMPs: • LW20-22 WMP, Section 4, pp 10-25. • LW23-27 WMP, Section 4, pp 11-33.
		c) a detailed description of the measures that would be implemented to remediate predicted impacts; and	C	Management measures that will be implemented to remediate impacts on water resources and watercourses are provided in the EP WMPs: • LW20-22 WMP, Section 8, pp 100-107. • LW23-27 WMP, Section 8, pp 121-127.
		d) a contingency plan that expressly provides for adaptive management.	C	The EP WMPs provide a contingency plan, including consideration of adaptive management under circumstances where a water resource or watercourse performance measure has been exceeded": • LW20-22 WMP, Section 9, pp 108-109. • LW23-27 WMP, Section 9, pp 128-129.
5	Condition 9(d) Research Program	The Proponent shall prepare and implement a Research Program for the project to the satisfaction of the Director-General. This program must be directed at encouraging research into improving: • … • the remediation of subsidence impacts on	C	Condition 9 allowed the selection of research areas from a potential six topics, two of which were related to surface water. From the six topics, three research studies have been selected to be funded by the project. These studies are related to other areas covered by this approval condition. The 2010 AR provides a summary of the selection process (AR2010, S3, p90). DP&I approved the Program on 27 May 2011 [Approval Sighted], noting that a copy of the Research Program must be made publicly available via the website. The Research Program is uploaded on the website.

	Item	Summary of requirement	Compliance status*	Evidence of implementation
		watercourses; • the understanding of subsidence impacts and their environmental consequences on swamps • … [Note – these are the surface water related Research Program options only]		The program is summarised in AR 2014, S3.9.2, pp 286-289. Although the research does not directly relate to surface water, the condition has been met.
Schedule 4 - Specific Environmental Conditions – General				
6	Condition 14 Discharges	The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits (both volume and quality) set for the project in any EPL.	CO	Quality – Refer to EPL Audit Checklist, Item 3. Volume – Refer to EPL Audit Checklist, Item 9.
7	Condition 15 Surface Facilities Water Management Plan	The Proponent shall prepare and implement a Water Management Plan for the surface facilities area and two ventilation shaft sites to the satisfaction of the Director-General.	C	SFWMP Rev C approved by DP&I on 14 April 2011 [Approval Sighted]. The water management system includes the major surface facilities area and ventilation shaft sites (SFWMP Section 5, pp p-13).
		This plan must be prepared in consultation with DWE and DECC by a suitably qualified expert/ whose appointment has been endorsed by the D-G, and submitted to the D-G for approval by the end of June 2010.	A	• The Revision Table notes that Rev A of the SFWMP was distributed to DECC, NSW Office of Water and DP&I. • The SFWMP was prepared by Gilbert & Associates Pty Ltd and HCPL. These experts were endorsed by DP&I on 12 March 2011 [Approval Sighted]. • No evidence that the document was provided by due date.
		In addition to the standard requirements for management plans (see condition 2 of schedule 7), this plan must:	C	Relevant section references provided in Table 1, p7 of the SFWMP.
		a) include a comprehensive water balance for the project; and	CO	• The SFWMP references water balance in two different contexts: - Surface facilities water management schematic and **predictive** water balance analysis (including underground water make) for average, 10th percentile wet and 10th percentile dry rainfall years (Section 4.1.1, pp 11-12 and Table 2, p13). Table 2 indicates that water from underground is predicted to account for approximately 50-56% of inflow to the site. - Figure 7, p18 – daily mine water make calculated as difference between measured/estimated inflows and outflows of water from workings. The SFWMP also provides an initial assessment of the water make in the underground mine (estimated to be 0.07 ML/day based on a "more realistic estimate of ROM coal moisture content of 7%").

	Item	Summary of requirement	Compliance status*	Evidence of implementation
				• ARs assess mine water make from metered water into and out of the mine, periodic monitoring of moisture content of ventilation air and monitoring of ROM moisture content. • Metropolitan Coal is currently undertaking a comprehensive data gathering project with the aim of updating the current site water balance model. [Refer to SoC Audit Checklist Item 8].
		b) ensure that suitable measures are implemented to minimise water use, control erosion, prevent groundwater contamination, and comply with any surface water discharge limits.	C	SFWMP (Section 6, p 19, Table 7) outlines the performance indicators that will be used to assess whether suitable measures are in place to meet the objectives to minimise water use, control erosion, prevent groundwater contamination, and comply with any surface water discharge limits.
		Note: The water balance in this plan must be suitably integrated with both the Catchment Monitoring Program and the Water Management Plans that form part of the Extraction Plan.	C N	• The SFWMP (Section 7.4, p 21) states that "*The mine water make water balance has been suitably integrated with the Metropolitan Mine Catchment Monitoring Program and the Metropolitan Mine Longwalls 20-22 Water Management Plan*". • The CMP (Section 5.4.4. p 80), LW20-22 WMP (Section 7.6, p 79) and LW23-27 WMP (Section 7.6, p 95) include details of the monitoring program to assess mine water make, that reflect the monitoring specified in the SWMP. • The minimum frequency of mine ventilation moisture content readings is specified in the EP WMPs and the SFWMP.
Schedule 6 - Rehabilitation & Offsets				
8	Condition 1 Rehabilitation Objectives	The Proponent shall, to the satisfaction of the D-G of DPI, restore surface flow and pool holding capacity as soon as reasonably practicable for: • Waratah Rivulet, between the downstream edge of Flat Rock Swamp and the full supply level of the Woronora Reservoir; and	N CO	Note: Flat Rock Swamp not shown on any figure in the EP WMPs. Flat Rock Swamp is shown on figure 9 of The Helensburgh Coal Submission to Independent Expert Panel - Inquiry into NSW Southern Coalfield (July 2007). • AR2012: The 2012 Annual review states that stream remediation activities have commenced at Pools A and F on the Waratah Rivulet in accordance with approvals obtained from the SCA under Part 5 of the EP&A Act (AR2012, Section 3.11.2.2, p 208 and Section 3.11.3.2, p 210). • AR2013: The 2013 Annual review states that no stream remediation activities were conducted on the Waratah Rivulet during the reporting period as access via Fire Road 9H was restricted while the road was deemed as being unfit for purpose by the SCA. While access was restricted, Metropolitan Coal commissioned a Continued Improvement Study to assess the efficacy of the stream remediation methodology. The Study considered the remediation works conducted to date to be functional (AR2013, Section 5.1.2.2, p 301). • AR2014: The 2014 Annual Review states that stream remediation activities commenced at Pool F in June 2014. Following stream remediation activities at Pool F, stream remediation

	Item	Summary of requirement	Compliance status*	Evidence of implementation
				activities will be conducted at Flat Rock Crossing (Pools G and G1), anticipated to commence in May 2015 (AR2014, Section 5.1.2.2, p 336 and Section 5.1.3.2, p 338).
		• Eastern Tributary, between the maingate of Longwall 26 and the full supply level of the Woronora Reservoir	N/A	Area not affected with scope of mine activities in 2011 to 2014.
9	Condition 2 Rehabilitation Strategy – Surface Facilities Area	By the end of October 2011, the Proponent shall prepare a Rehabilitation Strategy for the surface facilities area to the satisfaction of the D-G. With reference to surface water drainage and management, this strategy must:	C	• The Metropolitan Mine Rehabilitation Strategy, dated October 2011, is available on the project website. • The Rehabilitation Strategy was approved by the DP&I on 5 December 2011 [Approval sighted].
		a) be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Director-General;	C	The Rehabilitation Strategy was prepared by experts endorsed by DP&I on 8 October 2011 [Approval Sighted].
		b) be prepared in consultation with relevant stakeholders, including WCC and the CCC;	C	The RS was prepared in consultation with the WCC, CCC and H&DHS (RS, Section 2.2-2.4, pp 6-8).
		c) investigate options for the future use of the area upon the completion of mining;	C	RS, Section 4, pp12-14: Table 2 outlines the potential future land use options and associated key benefits and issues.
		d) describe and justify the proposed rehabilitation strategy for the area; and	C	Addressed throughout the RS.
		e) define the rehabilitation objectives for the area, as well as the proposed completion criteria for this rehabilitation.	C	Rehabilitation objectives are addressed in RS, Section 5, pp15-19 and RS, Section 6, p19.
10	Condition 4 Rehabilitation Management Plan	The Proponent shall prepare and implement a Rehabilitation Management Plan for the project to the satisfaction of the D-G of DPI, which addresses surface water drainage and management. This plan must be prepared in consultation with the relevant stakeholders, and submitted to DPI for approval prior to carrying out any second workings in the mining area.	C	• DP&I approved RMP Rev A on 14 May 2010, subject to comments provided in a letter dated 21 April 2010 being addressed prior to 31 October 2010 [Conditional Approval Sighted]. • I&I NSW (Mineral Resources) confirmed that comments identified on 14 May 2010 were satisfactorily addressed by Metropolitan Coal and approved RMP Rev B on 22 October 2010 [Approval Sighted]. • RMP Rev A was distributed to the SCA, DECCW, NSW Office of Water, I&I NSW (Fisheries), DoP and I&I NSW (Mineral Resources). RMP Rev B addressed comments from I&I NSW (Mineral Resources), SCA and DoP (RMP Revision Table). RMP Rev E addressed comments from SCA (RMP Revision Table). • The RMP is now administered by the DRE. DRE approved RMP Rev E on 22 May 2014 [Approval sighted].

	Item	Summary of requirement	Compliance status*	Evidence of implementation
Schedule 7 Environmental Management, Reporting and Auditing				
11	Condition 1 Environmental Management Strategy	The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the D-G. The strategy must (f) include:	C	EMS approved by DP&I on 14 November 2011 [Approval Sighted].
		• copies of the various strategies, plans and programs related to surface water management that are required under the conditions of this approval once they have been approved; and	C	EMS (Section 3.1, pp 6-7: Table 2) summarises Metropolitan Coal Environmental Management Plans and Monitoring Plans which Metropolitan Coal are required to prepare.
		• a clear plan depicting all the surface water monitoring currently being carried out within the project area.	C	EMS (Attachment 1-1, Figure 1-1B and Figure 1-1C) depict the surface water quantity and quality monitoring sites.
12	Condition 2 Management Plan Requirements	The Proponent shall ensure that the surface water management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	C	• LW20-22 WMP approved by DP&I on 14 November 2011 [Approval Sighted]. • LW23-27 WMP approved by DP&I on 9 April 2014 [Approval Sighted]. • SFWMP (Rev C) approved by DP&I on 14 April 2011 [Approval Sighted]. • CMP (Rev E) approved by DP&E on 25 August 2014 [Approval sighted]
		a) detailed baseline data;	C	• The EP WMPs provide baseline data for stream features, surface water flow, pool water levels, stream water quality and Woronora reservoir water quality: - LW20-22 WMP: Section 6.2, pp 34-69. - LW23-27 WMP, Section 6.2, pp 38-53. • The SFWMP provide baseline data for water use, discharge and stream water quality (Section 5, pp 14-18). • The CMP provide baseline data for stream features, surface water flow, pool water levels, stream water quality and Woronora reservoir water quality (Section 3.4, pp 11-28).
		b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions);	C	Statutory requirements are outlined in: • LW20-22 WMP, Section 3, pp 7-9. • LW23-27 WMP, Section 3, pp 8-10. • SFWMP, Section 3, pp 6-8.

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

Item	Summary of requirement	Compliance status*	Evidence of implementation
	• any relevant limits or performance measures/criteria;	C	Performance measures and indicators are outlined in: • LW20-22 WMP, Section 5, pp 30-31. • LW23-27 WMP, Section 5, pp 34-35.
	• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	C	• LW20-22 WMP: Performance measures and indicators (Section 5, pp 30-31) and methodology to assess performance indicators and measures (Section 7.8, pp 81-100) are provided. • LW23-27 WMP: Performance measures and indicators (Section 5, pp 34-35) and methodology to assess performance indicators and measures (Section 7.8, pp 96-120) are provided. • SFWMP: Water management performance indicators (Section 6, p19) are provided.
	c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	C	The EP WMPs outline the monitoring program implemented to monitor the impacts and environmental performance of the Project, including performance indicators and measures: • LW20-22 WMP, Sections 7, 8, 9 and 10. • LW23-27 WMP, Sections 7, 8, 9 and 10.
	d) a program to monitor and report on the: • impacts and environmental performance of the project; • effectiveness of any management measures (see c above);	C	• LW20-22 WMP: the process to assess performance indicators and measures is outlined in Section 7.8, pp 81-100. • LW23-27 WMP: the process to assess performance indicators and measures is outlined in Section 7.8, pp 96-120. • SFWMP: the process to assess monitoring results against performance indicators is outlined in Section 7.6, pp 21-22.
	e) a contingency plan to manage any unpredicted impacts and their consequences;	C	• LW20-22 WMP: Table 20, pp 82-86 provides contingency measures to be applied if performance indicators are exceeded and Section 9, p 108 outlines the contingency plan. • LW23-27 WMP: Table 19, pp 97-103 provides contingency measures to be applied if performance indicators are exceeded and Section 9, pp 128-129 outlines the contingency plan. • SFWMP: Table 8, p 22 provides contingency measures to be applied if performance indicators are exceeded and Section 9, p 24 outlines the contingency plan.
	f) a program to investigate and implement ways to improve the environmental performance of the project over time;	C	The EP WMPs will conduct an Annual Review of the environmental performance of the Project, which will include what measures will be implemented over the next year to improve the environmental performance of the Project. • LW20-22 WMP, Section 12, p 113. • LW23-27 WMP, Section 12, p 135.

Item		Summary of requirement	Compliance status*	Evidence of implementation
		g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and	C	The WMPs outline the reporting procedure for incidents, complaints and non-compliances with statutory requirements. • LW20-22 WMP, Section 13, p 113-115. • LW23-27 WMP, Section 13, p 136- 137. • SFWMP, Section 11, p 25. The EP WMPs also outline the protocol for managing and reporting any exceedances of the impact assessment criteria and/or performance criteria: • LW20-22 WMP, Section 9, p 108. • LW23-27 WMP, Section 9, p 128.
		h) a protocol for periodic review of the plan.	C	All water management plans are required to be reviewed within 3 months of submission of the Annual Review (Condition 3 of Schedule 7), an incident report (Condition 6 of Schedule 7) or an audit (Condition 8 of Schedule 7). Water management plans will also be reviewed within three months of approval of any Project modification. (LW20-22 WMP, Section 2, p6; LW23-27 WMP, Section 2, p 7; and SFWMP, Section 2, p 5 and CMP, Section 2, pp 4-5). A Management Plan and Monitoring Program Revision table, developed for Metropolitan Coal by an environmental consultant, has been sighted.
13	Condition 3 Annual Review	By the end of October 2010, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the D-G. This review must:	CO	• AR2012 for the period 1 August 2011 to 31 July 2012 was accepted by the DP&I on 16 November 2012 [Acceptance sighted]. • AR2013 for the period 1 August 2012 to 31 July 2013 was accepted by the DP&E on 26 May 2014 [Acceptance sighted]. • AR2014 for the period 1 August 2013 to 31 July 2014 was accepted by the DP&E on 8 May 2015 [Acceptance sighted].
		b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against: • the relevant statutory requirements, limits or performance measures/criteria; • the monitoring results of previous years; and • the relevant predictions in the EA, PPR, and Extraction Plan;	CO	• AR2012, AR2013 and AR2014 Sections 3 and 4 include relevant requirements or performance criteria, and a review of monitoring results, identification of trends in the monitoring data and the identification of any discrepancies between predicted and actual impacts. • AR2012, AR2013 and AR2014 Sections 3 and 4 include surface water monitoring results of previous years. • AR2012, AR2013 and AR2014 Section 6 provides a summary of community complaints (Refer to EPL Audit Checklist, Item 8). • The 2014 Complaints Register is provided on the Project website.

	Item	Summary of requirement	Compliance status*	Evidence of implementation
		c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	CO	AR2012, AR2013 and AR2014 identify non-compliances in Sections 3 and 4 in the sections titled "Assessment of Environmental Performance".
14	Condition 8 Independent Environmental Audit	By end of December 2011, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:	CO	This Surface Water Audit was undertaken in May 2015 following DP&E endorsement of audit team in December 2014. The first Surface Water Audit was undertaken in December 2011.
		c) assess the environmental (surface water aspects) performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals);	CO	Assessed in the 2015 and 2012 Environmental Audit - refer to summary in Section 2.1 of the 2015 Surface Water Environmental Audit Final Report.
		d) review the adequacy of surface water strategies, plans or programs required under these approvals; and, if appropriate; and	CO	Assessed in the 2015 and 2012 Environmental Audit – refer Section 2.2 of the 2015 Surface Water Environmental Audit Final Report.
		e) recommend measures or actions to improve the environmental (surface water) performance of the project, and/or any assessment, plan or program required under these approvals.	CO	Assessed in the 2015 and 2012 Environmental Audit – refer Section 2.3 of the 20115 Surface Water Environmental Audit Final Report.
15	Condition 10 Access to Information	From the end of 2009, the Proponent shall make the following information publicly available on its website:		
		b) a copy of the current environmental management strategy and associated surface water plans and programs;	CO	All relevant plans listed under the Project Approval have been uploaded on the project website.
		c) a summary of the surface water monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval;	CO N	A summary of surface water monitoring is provided on the Project website for both the mine area and surrounds and the surface facilities area for 2010-2013. The ARs, which include a summary of surface water monitoring, have been uploaded to the project website. AR2014 was provided for the 2015 audit, however it had not been uploaded to the Project website at the time of the audit.

2 Environmental Protection License #767

Item		Summary of requirement			Compliance status*	Evidence of implementation
1	Condition P1.3 Location of monitoring/discharge points				N	Note: Points 6, 7 and 8 are not active discharge points. The monitoring at Point 9 required by condition M2 is conducted to determine compliance with the limits specified for Points 6 & 7 in condition L2.4.
		EPA ID	Type of monitoring/ discharge point	Description of location		
		6	Discharge to Waters	The pipe outlet to Camp Creek upstream of the existing weir wall shown on drawing No. M518 titled "EPA Monitoring Points" dated 10/11/06 and contained in DEC file number 280026A22.	N/A	Point 6 is not an active discharge point.
		7	Discharge to Waters	The outlet of the concrete flume (from the water treatment plant) to Camp Creek shown on drawing No. M518 titled "EPA Monitoring Points" dated 10/11/06 and contained in DEC file number 280026A22.	N/A	Point 7 is not an active discharge point.
		8	Discharge to Waters	The overflow from the Turkey Nest Dam to Camp Creek shown on drawing No. M518 titled "EPA Monitoring Points" dated 10/11/06 and contained in DEC file number 280026A22.	N/A	Point 8 is not an active discharge point.
		9	Effluent Quality Monitoring	The clean water tank of the water treatment plant shown on Drawing No. SADA-G-013 titled "Water Clean-up Plant General Arrangement" dated 12/11/2001 and contained in DEC file no. 280026A15	CO	• Clean water tank is shown on Drawing SADA-G-013. • Discharge Point 9 is shown in AR2014, Figure 9, p 24. • The Annual Reviews and Annual Returns provide water quality results from monitoring undertaken at Point 9 (the clean water tank at the Water Treatment Plant).
		10	Volume Monitoring	The flowmeter on the pipeline discharging from the clean water tank in the water treatment plant shown on Drawing No. SADA-G-013 titled "Water Clean-up Plant General Arrangement" dated 12/11/2001 and contained in DEC file no. 280026A15	CO N	• Volume Monitoring Point 10 is shown in AR2014, Figure 9, p 24 (but is not clearly shown on Drawing SADA-G-013). • AR2014 states “discharge volume is monitored at site 10 (flow meter on the pipeline discharging from the clean water tank in the water treatment plant)” (AR2014, p 23). However, results not reported in Annual Reviews or Annual Returns. • The Annual Reviews provide the total amount of water discharged from the Water Treatment Plant to Camp Gully during

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

Item		Summary of requirement			Compliance status*	Evidence of implementation
						the reporting period.
2	Condition L1.1 Pollution of waters	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*.			CO	The ARs state that surface water discharges comply with the requirements of EPL No. 767: • AR2012 (Section 4.3.3, Table 50, p 245). • AR2013 (Section 4.3.3, Table 61, p 287). • AR2014 (Section 4.3.3, Table 60, p 321).
3	Condition L2.4 Concentration Limits [previously L3.3]	For discharge points 6 and 7, concentration limits not to exceed (100 percentile Concentration Limit):			N	Condition L3.3 renumbered to Condition L2.4 in EPL767 version 19 Dec 2011. The Annual Reviews and Annual Returns provide water quality results from monitoring undertaken at Point 9 (the clean water tank at the Water Treatment Plant). Point 6 and Point 7 are not active discharge points, and as such are not monitored. Refer note below.
		• Oil & grease:	10 mg/L		CO	• AR2012 No exceedance of oil & grease at Point 9 (AR2012, Section 4.3.2, p 242). • AR2013 No exceedance of oil & grease at Point 9 (AR2013, Section 4.3.2, p 285). • AR2014 No exceedance of oil & grease at Point 9 (AR2014, Section 4.3.2, p 320).
		• pH	6.5-8.5		CO	• AR2012 No exceedance of pH at Point 9 (AR2012, Section 4.3.2, p 241). • AR2013 No exceedance of pH at Point 9 (AR2013, Section 4.3.2, p 284). • AR2014 No exceedance of pH at Point 9 (AR2014, Section 4.3.2, p 319).
		• Total suspended solids	30 mg/L		CO	• AR2012 No exceedance of TSS at Point 9 (AR2012, Section 4.3.2, p 242). • AR2013 No exceedance of TSS at Point 9 (AR2013, Section 4.3.2, p 285). • AR2014 No exceedance of TSS at Point 9 (AR2014, Section 4.3.2, p 320).
		Note: The monitoring at Point 9 required by condition M2 is conducted by the licensee to determine compliance with the limits specified for Points 6 & 7 in condition L2.4.			N	Noted.

	Item	Summary of requirement				Compliance status*	Evidence of implementation
4	Condition M1.2 Monitoring Records	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.				CO	Examples of monitoring records in Excel format sighted. Records are in a legible format, and date back to 2010. Examples of results from 2008 have been provided
5	Condition M1.3 Monitoring Records	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.				A	Monitoring records in Excel format sighted, including date and location sampled. Laboratory analytical report also sighted. The time(s) at which the sample was taken and the name of the person who collected the sample were not visible on the Excel monitoring records or analytical report.
6	Condition M2.3 Requirement to monitor concentration of pollutants discharged [previously M2.1]	At Effluent Quality Monitoring Point 9, the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each of the following pollutants using the specified sampling method, units of measure and frequency:				N CO	Condition M2.1 renumbered to Condition M2.3 in EPL767 version 19 Dec 2011 • The required pollutants were monitored at Point 9 (AR2012, pp 241-243; AR2013, pp 284-286; AR2014, pp 319-320). • Refer to EPL Audit Checklist Item 3.
		Pollutant	Units	Frequency	Sampling Method		
		Oil and Grease	mg/L	Monthly during discharge	Grab sample	CO	Monthly data presented in: • AR2012, Chart 151, p 243. • AR2013, Chart 132, p 285. • AR2014, Table 59, p 320.
		TSS	mg/L			CO	Monthly data presented in: • AR2012, Chart 152, p 243. • AR2013, Chart 133, p 285. • AR2014, Table 59, p 320. "*The site water management system continuously monitors total suspended solids and prevents discharges of water that exceeds the criteria. Water that exceeds the criteria is treated further to ensure that only water which meets the acceptable criteria is discharged.*" (AR2012, p 242; AR2013, p 285; AR2014, p 323)

Item		Summary of requirement				Compliance status*	Evidence of implementation
		pH	pH			CO	Monthly data presented in: • AR2012, Chart 150, p 242. • AR2013, Chart 131, p 284. • AR2014, Table 59, p 320.
7	Condition M3.2 Testing methods - concentration limits	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.				CO	• Environmental Earth Sciences (contractor for water sampling) employs standard methods which comply or exceed the minimum requirements in *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales* (DEC, 2004), as detailed in their Soil, Gas and Groundwater [and Surface water] Sampling Manual (26 August 2011) [sighted]. • Surface water quality testing is undertaken by Sydney Analytical Laboratories - a NATA Accredited Laboratory. Laboratory analytical report sighted. • Example Chain of Custody form sighted.
8	Conditions M4.1-M4.3 Recording of pollution complaints	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 surface water pollution arising from any activity to which this licence applies.				CO	A summary of community complaints is provided in the ARs: • AR2012: Section 6, pp 259-260 and Appendix 3. • AR2013: Section 6.1, p 323 and Appendix 4. • AR2014: Section 6.1, p347 and Appendix F. The 2014 Complaints Register is provided on the Project website.
9	Condition M6.1 Requirement to monitor volume or mass	At discharge point 10, the licensee must monitor the volume of liquids discharged at the following specified frequency, units of measure and method: Frequency: Continuous; Units: kL/day; Sampling Method: Magnetic flow meter				CO	The ARs state the monitoring complies with the EPL and provide the total discharge volume for the reporting period: • AR2012 (Section 4.3.2, p241). • AR2013 (Section 4.3.2, p 284). • AR2014 (Section 4.3.2, p 319).
10	Condition R1.1 Annual return documents	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: a) a Statement of Compliance; and b) a Monitoring and Complaints Summary. 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				N CO	Condition R1.1 wording altered in EPL767 version 19 Dec 2011 2012, 2013 and 2014 Annual Returns Sighted. • 2012 Annual Return accepted by EPA on 4 April 2013 [Sighted]. • 2013 Annual Return accepted by EPA on 2 June 2014 [Sighted] • Metropolitan has not yet received acceptance of 2014 Annual Return from EPA.

	Item	Summary of requirement	Compliance status*	Evidence of implementation
11	Condition R1.7 Annual return documents [previously R1.8]	Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder.	N CO	Condition R1.8 renumbered to Condition R1.7 in EPL767 version 19 Dec 2011 for water monitoring requirements. 2012, 2013 and 2014 Annual Returns (including signature and certification) sighted.
12	Condition R2 Notification of Environmental Harm	The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	C	AR2012: one environmental incident occurred on 15 August 2011. This incident was reported by phone to both the EPA/OEH and DP&I on 15 August 2011 (AR2012, Section 4.3.2, p 244). An Environmental Incident Report was sent to the OEH representative on 22 August 2011 [Sighted]. No environmental incidents were reported in AR2013 and AR2014.

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable.

3 Mining Lease 703

	Item	Summary of Requirements	Compliance Status*	Evidence of Implementation
Mining, Rehabilitation, Environmental Management Process (MREMP) Mining Operations Plan (MOP)				
1	Condition 2	(4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:- g) water management systems (including erosion and sediment controls);	CO	• MOP (October 2005- September 2012 + amendment dated 18 May 2010), accepted by DRE 20 May 2010 (Acceptance sighted). Water management system is detailed in: - Section 3.8, pp16-17, Water Management. - Table 6.1, p 22, Environmental Risk Identification Matrix. - Section 6.2, p 22, Erosion/ Sediment Minimisation. • MOP (October 2012- September 2019), accepted by DRE 10 January 2013 (Acceptance sighted). Water management system is detailed in: - Section 2.2.2, p20, Mine Development and Sequence. - Section 3.2.3, pp 30-31, Erosion and Sedimentation. - Section 6.2, p 66, Erosion and Sediment Control Measures. - Table 11, p69, Summary of Potential Subsidence Impacts and Relevant Plans. The MOP presents a schedule of proposed mine development for a period of up to 7 years. No diagrams are included in the MOPs. However, reference is made to *Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries [Department of Environment and Climate Change, 2008].*
Management and Rehabilitation of Lands (General)				
2	Condition 25	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or sedimentation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution, erosion or sedimentation of any river, stream, creek, tributary, lake, dam, reservoir,	CO	• Stream bank erosion mitigation measures are detailed in LW20-22 WMP, Section 8.2.2, p106 and LW23-27 WMP, Section 8.2.2, p126. • Construction erosion and sediment management is detailed in the Construction Management Plan, Section 6.3, p 18. • Erosion control at the Major Surface Facilities Area and at the

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

	Item	Summary of Requirements	Compliance Status*	Evidence of Implementation
		watercourse or catchment area or any undue interference to fish or their environment.		Ventilation Shafts is detailed in SFWMP, Section 8.2, p 23. • Containment and isolation measures for potential contaminants on site are detailed in SFWMP, Section 8.3, p 23. • Additional system integrity measures are detailed in SFWMP, Section 8.5, p 24. • Refer to MCoA Audit Checklist, Items 1-6.
Soil Erosion				
3	Condition 30	The lease holder shall conduct operations in such a manner as not to cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	CO	• Stream bank erosion mitigation measures are detailed in LW20-22 WMP, Section 8.2.2, p106 and LW23-27 WMP, Section 8.2.2, p126. • Erosion control at the Major Surface Facilities Area and at the Ventilation Shafts are detailed in SFWMP, Section 8.2, p23.
Catchment Area				
4	Condition 34	a) The lease holder shall carry out operations within the Woronora Special Area in such a way as to conform strictly to all provisions of the *Sydney Water Catchment Management Act, 1998* and the regulations made and currently in force under that Act so that: (i) no catchment infrastructure works and buildings owned by or vested in the SCA, or the stored waters, are wilfully, accidentally or negligently destroyed, damaged or interfered with; (ii) the Woronora Special Area is not polluted by operations of the lease holder; (iii) the purity of the stored waters within the Woronora Dam are preserved; (iv) any requirements notified by the SCA to the lease holder, made in accordance with the provisions of the *Sydney Water Catchment Management Act, 1998* and the regulations made thereunder, are complied with.	CO	• The EP WMPs state that "Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act", including the *Sydney Water Catchment Management Act, 1998* (LW20-22 WMP, Section 3.3, p 9; LW23-27 WMP, Section 3.3, p 10). • The EP WMPs identify management and mitigation measures to ensure no surface water pollution (refer to MCOA Audit Checklist, Item 1). • MOP (October 2005- September 2012: - Section 3.1, p 12. • MOP (October 2012- September 2019): - Section 2.2.1, pp 19-20. - Section 3.2.3, pp 30-31.
		b) If the lease holder shall at all times and at the first available opportunity notify the SCA of its current use or its intended use of any process which is likely to pollute the Woronora Special Area, the stored waters of the Woronora Dam or cause damage to the catchment infrastructure works, buildings and stored waters owned by the SCA situated on the Special	CO	• MOP (2012-2019), p 31 "*Surface works in the Woronora Special Area are conducted in consultation with the SCA.*" • MOP (2012-2019), p 19 "*As the requirement for surface construction works arise, Metropolitan Coal will provide the*

	Item	Summary of Requirements	Compliance Status*	Evidence of Implementation
		Area.		*specific details of the proposed surface construction works (in the form of a completed Surface Works Assessment Form [Appendix 1 of the ConMP]) to the DP&I and SCA for comment*." • MOP (2012-2019), p 67: "*Metropolitan Coal will consult with the SCA and DTIRIS - Minerals and Energy Division prior to the conduct of any active revegetation in the Woronora Special Area*."
		c) The SCA shall within 5 working days following the receipt of the lease holder's notification as referred to in Condition 34 (b), inform the lease holder and the Minister of its opinion of the likely impact of the process to pollute the Woronora Special Area and stored waters and to cause damage to the catchment infrastructure works, buildings and stored waters owned by the SCA.	N/A	SCA action.
		d) The lease holder, upon service of a notice under the hand of the Minister to do so shall: (i) immediately discontinue the use of such process (and in all cases within twenty four (24) hours); or (ii) thereafter refrain from adopting such process at any time, as the case may require The lease holder shall undertake environmental assessment for all surface works (including exploration, drilling, clearing of vegetation, and construction of access tracks) within the Woronora Special Area. The assessments are to be to the satisfaction of the SCA.	CO	Under the *Protection of the Environment Operations Act*, 1997 (POEO Act), (Clause 101 – Prohibition on activities) the Minister may direct the cessation of an activity causing harm/ likely to cause harm to the environment. Metropolitan Mine is to take all available steps to cause the activity to cease. The EP WMPs state that "*Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act*", including the POEO Act, 1998 (LW20-22 WMP, Section 3.3, p 9; LW23-27 WMP, Section 3.3, p 10).
		f) The lease holder is to obtain the permission of the SCA to enter the Woronora Special Area.	CO	Metropolitan Mine has had several different access agreements with SCA. SCA has now been amalgamated with Water NSW, and a revised agreement is being developed between Metropolitan Mine and Water NSW. A draft Special Areas Mining Consent has been sighted. Condition 1.1.1 states "*In accordance with the provisions of Division 1 of Part 3 of the Water NSW Regulation 2013, Water NSW grants to the Consent Holder consent to enter and remain on the Designated Area for the purpose of undertaking the Permitted Activity in accordance with the conditions of this Consent*."

	Item	Summary of Requirements	Compliance Status*	Evidence of Implementation
		g) The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent the contamination, pollution, erosion or sedimentation of any stream or watercourse or Special Area and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution or sedimentation of any stream watercourse or Special Area.	CO	Refer to ML Audit Checklist, Item 2.

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable.

4 Statement of Commitments (EA and PPR)

	Item	Summary of requirement	Compliance status*	Evidence of implementation
1	Subsidence Management Plans (SMPs)	The main areas to be addressed by a SMP application include: • expected subsidence and its potential impacts on the environment (surface water).	C	• Section 4.2 and 4.3 of the LW20-22 WMP and LW23-27 WMP address revised subsidence predictions and revised assessment of potential subsidence impacts and environmental consequences, including on Surface Water. • Subsidence Management Plan approval for LW23a, dated 11 April 2014, has been sighted. • The LW20-22 Subsidence Monitoring Program is Attachment 1 to the LW20-22 Extraction Plan. The LW23-27 Subsidence Monitoring Program is Attachment G to the LW23-27 Extraction Plan. • At the time, Metropolitan Coal was not required to obtain Subsidence Management Plan approval for LW20-22.
2	Waratah Rivulet Management Plan (WRMP)	A WRMP will be developed in consultation with the relevant authorities.	C	The management of the Waratah Rivulet is documented in the EP WMPs: • LW20-22 WMP: The document Revision Status Register notes that Rev A was distributed to the SCA, DECCW and DoI. • LW23-27 WMP: The document Revision Status Register notes that Rev A and Rev B was distributed to the DP&I, SCA, OEH and NOW. Rev C addressed comments from the DP&I and SCA, and was distributed to these parties only.
		The WRMP will be developed to the satisfaction of the NSW Department of Planning (DoP).	C	• LW20-22 WMP (Rev C) approved on 14 Nov 2011 by DP&I [Approval Sighted]. • LW23-27 WMP (Rev C) approved on 9 April 2014 by DP&I [Approval Sighted].
		The WRMP will be an operational document that will be reviewed and updated to reflect the status of longwall mining, revised subsidence predictions and any advances in stream restoration methods.	C	• LW20-22 WMP has been reviewed and revised from the original: Rev B addressed comments by the SCA; Rev C addressed comments by the SCA and NOW and was reviewed/revised following submission of 2010 Annual Review. • LW23-27 WMP has been reviewed and revised from the original: Rev B addressed comments by the SCA and NOW; Rev C

Item	Summary of requirement	Compliance status*	Evidence of implementation
			addressed comments from the DP&I and SCA.
	The WRMP will comprise the following elements: • identification of evaluation zones where an adaptive management approach will be implemented;	A	Adaptive management referenced as a management and contingency measure in LW20-22 WMP (Table 20, pp82-84 and Section 9, pp 108-109) and LW23-27 WMP (Table 19 pp 97-103 and Section 9, pp 128-129), but no reference to specific evaluation zones where adaptive management will be applied.
	• subsidence measurement for comparison with predictions;	C	The EP WMPSs state "*surveys will be conducted to measure subsidence movements in three dimensions using a total station survey instrument… A monitoring program will be implemented to monitor the impacts and environmental performance of the Project on water resources and watercourses*." • LW20-22 WMP, Section 7, p 73. • LW23-27 WMP, Section 7, p 88.
	• a Trigger Action Response Plan with trigger mechanisms that initiate a range of responses (e.g. a higher intensity of monitoring and/or the implementation of response measures) and that identify personnel responsible for implementation of the response measures;	C	Trigger Action Response Plans (TARPs) can be found in the EP WMPs: • LW20-22 WMP, Section 10 and Table 21, pp 109-110. • LW23-27 WMP, Section 10 and Table 20, pp 130-131.
	• stream restoration phases over relevant reaches of the Waratah Rivulet;	C	Waratah Rivulet stream remediation is detailed in the EP WMPs: • LW20-22 WMP, Section 8.1.1, pp 101-104. • LW23-27 WMP, Section 8.1.1, pp 121-124.
	• environmental monitoring, environmental control measures (e.g. vegetation management, erosion and sediment control, fuel management and polyurethane product management) and reporting for stream restoration works; and	C	Environmental management and monitoring for stream restoration works are detailed in the EP WMPs: • LW20-22 WMP, Section 8.1.3, pp 104-105. • LW23-27 WMP, Section 3.1.3, pp 124-126. "Management measures will be reported in the Annual Review" (LW20-22 WMP, Section 8, p 101 and LW23-27 WMP Section 8, p 121).
	• contingency measures in the event that observed subsidence effects are significantly greater than predicted.	C	The EP WMPs outline a contingency plan in the following sections: • LW20-22 WMP, Section 9, pp 108-109. • LW23-27 WMP, Section 9, pp 128-129.

	Item	Summary of requirement		Compliance status*	Evidence of implementation
3	Mine Closure Plan (MCP)	Prior to the completion of mining operations, a MCP will be developed. The MCP will describe: • measures to maintain downstream water quality; • post-closure surface water monitoring requirements;		N/A	Mine Closure Plan not required at this stage.
4	Water Savings Action Plan (WSAP)	The Project will continue to build on the Metropolitan Colliery WSAP initiatives undertaken to date to increase the efficiency of water use and minimise the requirement for make-up water and off-site water releases. The WSAP will be reviewed and revised, where appropriate.		C	The SFWMP contains the objective to minimise the use of potable water (i.e. town water) and maximise the use water recycled from underground and water captured on site (Table 7). The SFWMP has undergone 3 revisions (Rev A – C).
5	Table SoC-1 Compensatory Measures & Ecological Initiatives	Compensatory Measure or Ecological Initiative: research into subsidence effects on streams and stored water.		C	Refer to MCoA Audit Checklist – Item 5.
6	Table SoC-2 Overview of the Proposed Environmental Monitoring Programme (Surface Water) (Refer EA Section 4.4.3)	Monitoring Focus	Monitoring Sites		
		Rainfall	• PV1 (Waratah Rivulet catchment) • PV2 (Woronora River catchment)	CO	• PV1 and PV2 listed in LW20-22 WMP Table 9 (p 32) and LW23-27 WMP Table 8 (p 36). • Location of rainfall monitoring points shown on LW20-22 WMP Figure 20 (p 33) and LW23-27 WMP Figure 23 (p 37). • AR2012: daily rainfall for PV1 shown on Charts 13-14 (pp 46-47), Charts 17- 25 (pp 49-54), Chart 85 (p116), Charts 87- 91(pp 117-120), Charts 122-125 (pp 189-191). PV2 Rainfall residual mass is shown on Chart 86 (p116). Monthly totals for Helensburgh (68028) shown on Chart 149 (p249). • AR2013: daily rainfall for PV1 shown on Charts 13 -14 (pp 65-66), Charts 17-25 (pp 69-73), Charts 80- 86 (pp 138-143), Charts 117- 122 (pp 228-232). Monthly totals for Helensburgh (68028) shown on Chart 130 (p283). • AR2014: daily rainfall for PV1 shown on Charts 8-11 (pp 70-72), Charts 26- 31 (pp 82-85), Charts 84- 88 (pp 154-157), Charts 117- 123 (pp 213-216), and Charts 143 -152 (pp 249-264). Monthly totals for Helensburgh (68028) shown on Chart 159 (p319).
		Evaporation	• At or near the Woronora Reservoir	CO	• Location of evaporation monitoring points shown on LW20-22 WMP Figure 20 (p 33) and LW23-27 WMP Figure 23 (p 37). • LW20-22 WMP Table 9 (p 32) and LW23-27 WMP Table 8 (p 36)

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

Item		Summary of requirement		Compliance status*	Evidence of implementation
				N	lists evaporation data at the Woronora Reservoir (566052). • No evaporation data quoted in ARs.
		Surface water flow	• GS2132102 (Waratah Rivulet) (SCA data) • GS2132101 (Woronora River) (SCA data) • GS213200 (O'Hares Creek) (NSW DWE data)	CO	• Location of SCA gauging stations shown on LW20-22 WMP Figure 21 (p35) and LW23-27 WMP Figure 24 (p39). • Monitoring results for all three stations shown on AR2012 Chart 6 (p 41) and AR2013 Chart 6 (p 60). • Surface water flow was not reported in AR2014 - refer to MCoA Audit Checklist, Item 1.
		Pool water level	• Pools A, B, C, E, F, G, G1, H and I • Major pools on Waratah Rivulet • Two representative pools on Woronora River • Selected pools in the lower reaches of the Eastern Tributary	CO	• Location of pools on Waratah Rivulet and Eastern Tributary shown on LW20-22 WMP Figure 5 (p 14) and LW23-27 WMP Figure 5 (p 15). • The ARs state that water levels in a number of pools on the Waratah Rivulet, Eastern Tributary, Tributary B and Woronora River have been either manually monitored on a daily basis or monitored using a continuous water level sensor and logger (AR2012 p 42, AR2013 p 61, and AR2014 p 59). • Monitoring results for Pools A, B, C, E, F, G, G1, H and I are shown on AR2012 Chart 126 (p 211), AR2013 Charts 135-139 (pp 304-306), AR2014 Charts E1-E9 (Appendix E).
		Storage characteristics and cease to flow levels of monitored pools	• Pools A, B, C, E, F, G, G1, H and I • Major pools on Waratah Rivulet • Two representative pools on Woronora River • Selected pools in the lower reaches of the Eastern Tributary	CO	• Location of pools on Waratah Rivulet and Eastern Tributary shown on LW20-22 WMP Figure 5 (p 14) and LW23-27 WMP Figure 5 (p 15). • The EP WMPs state that, for Waratah Rivulet Pools G1, H and I, "The water depth is directly measured by the water level sensor and will be assessed against the relevant 'cease to overflow' value" (LW20-22 WMP, Section 8.1.1, p 102; and LW23-27 WMP, Section 8.1.1, p 122). • The ARs state that water levels in pools on the Waratah Rivulet and Eastern Tributary are monitored in accordance with the CMP and WMPs, and that stream remediation will be initiated if the water level in a pool falls below its cease to overflow level (AR2012, Section 3.11.3.2, p 210; AR2013, Section 5.1.3.2, p 303; AR2014 Section 5.1.3.2, p 337). • Pool A water level is plotted with cease to flow level in ARs

	Item	Summary of requirement		Compliance status*	Evidence of implementation
				N	(AR2012, Chart 127 p 212; AR2013, Chart 144, p310; AR2014, Chart E10, p E-5). • Storage characteristics not specifically addressed in WMP.
		Surface water quality: EC, pH, redox potential, DO, turbidity, Ca, Mg, Na, K, chloride, sulphate, bicarbonate, TN, TP, nitrate, Ba, Sr, Mn, Fe, Zn, Co, Al	• WRWQ1 to 9 • Eastern Tributary • Woronora River • Honeysuckle Creek • Bee Creek • Woronora Reservoir (SCA data) *(Note: Monitoring site locations are shown in Appendix C and Figure 4-6 of the EA.)*	CO	• Location of surface water quality monitoring sites are shown on LW20-22 WMP Figure 26 (p 43) and LW23-27 WMP Figure 29 (p 47). • Locations of surface water quality monitoring sites are shown on AR2012, Figure 8, p 12; AR2013, Figure 13, p 33; and AR2014 Figure 13, p 29. • The ARs state that all listed surface water quality parameters were monitored at the sites shown in Figure 8 (AR2012) or Figure 13 (AR2013 and AR2014) (AR2012, Section 3.3.2, p 42; AR2013, Section 3.3.2, p 61; AR2014, Section 3.3.2.4, pp 59-60). • Monitoring results are shown for EC, pH and dissolved Mn, Fe and Al in AR2012 Charts 8-12 (pp 43-45), AR2013 Charts 8-12 (pp 62-64), and AR2014 Charts 33- 38 (pp 90-92). • A summary of surface water monitoring is provided on the Project website for both the mine area and surrounds and the surface facilities area for 2010-2013.
		Site water balance	Major Surface Facilities Area and underground mining	CO	• Refer to MCoA Audit Checklist Item 7 and SoC Audit Checklist Item 8.
7	Surface Water Monitoring	A surface water monitoring programme will be developed for the Project and detailed in the Project EMP. The frequency, parameters and locations monitored as part of the surface water quality monitoring programme will also be described in the Project EMP. However, it is anticipated that the following will be incorporated in the Project EMP:		C	• The details of the surface water monitoring programme are contained in the LW20-22 WMP and LW23-27 WMP.
		• the existing pluviometer network will be maintained over the life of the Project;		CO	The EP WMPs outline the pluviometer network to be monitored: • LW20-22 WMP, Section 6.1, p 32. • LW23-27 WMP, Section 6.1, p 36. Refer to SoC Audit Checklist– Item 6.
		• an evaporation pan will be re-established at or near the Woronora Reservoir;		C	• Refer to SoC Audit Checklist– Item 6.

Item	Summary of requirement	Compliance status*	Evidence of implementation
	• stream flow gauging stations on Waratah Rivulet, Woronora River and O'Hares Creek will be maintained over the life of the Project;	CO N	The EP WMPs outline the surface water flow gauging stations monitored on Waratah Rivulet, Woronora River and O'Hares Creek: • LW20-22 WMP, Section 6.2.2, pp 34-36. • LW23-27 WMP, Section 6.2.2, pp 38-40. • Refer to SoC Audit Checklist – Item 6. Note: the gauges on the Waratah Rivulet and the Woronora River are owned and operated by SCA. The gauges on O'Hares Creek are owned and operated by OEH.
	• the existing water quality monitoring regime conducted by HCPL on Waratah Rivulet will continue and will be supplemented by on-going monitoring in the Eastern Tributary, Woronora River, Honeysuckle Creek and Bee Creek;	CO	Water quality data has been collected at a large number of sites on the Waratah Rivulet and other streams, including Eastern Tributary, Woronora River, Honeysuckle Creek and Bee Creek: • LW20-22 WMP, Section 6.2.4 pp 41-42. • LW23-27 WMP, Section 6.2.4, pp 45-46. Refer to SoC Audit Checklist – Item 6.
	• water quality sampling in Woronora Reservoir will continue;	CO	Baseline water quality sampling is provided in the EP WMPs: • LW20-22 WMP, Section 6.2.5, pp 49-50. • LW23-27 WMP, Section 6.2.5, p 53. Refer to SoC Audit Checklist – Item 6.
	• water level monitoring of major pools on Waratah Rivulet will continue for the life of the Project;	CO	Pool water level monitoring sites and future monitoring program are provided in the EP WMPs: • LW20-22 WMP, Section 6.2.3, pp 40-41 and Section 7.3.2, pp 76-77. • LW23-27 WMP, Section 6.2.3, pp 44-45 and Section 7.3.2, pp 91-82. • Refer to SoC Audit Checklist – Item 6.
	• water levels in two representative pools on Woronora River and in selected pools that occur in the lower reaches of the Eastern Tributary will be monitored using continuous water level monitoring devices; and	CO	Pool water level monitoring sites are provided in the EP WMPs: • LW20-22 WMP Section 6.2.3, pp 40-41. • LW23-27 WMP, Section 6.2.3, pp 44-45. • Refer to SoC Audit Checklist – Item 6.
	• storage characteristics (volume versus level) and cease to flow levels of all monitored pools will be determined by survey.	A	Refer to SoC Audit Checklist – Item 6. Storage characteristics not specifically addressed in WMP.

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

	Item	Summary of requirement	Compliance status*	Evidence of implementation
8	Site Water Balance	The site water balance will be monitored and reviewed annually to optimise performance and validate predictions.	A	• The SWMP (which includes the site water balance) is reviewed within 3 months of submission of the Annual Review, an incident report or an audit (SFWMP, Section 2, p 5). However, the water balance has not been revised or updated annually to date - the mine has been undertaking significant works as part of an expansion project (including changes to the surface facilities area), and as such any revisions to the water balance would quickly be made redundant. • As these expansion works are nearing completion, Metropolitan Coal is currently undertaking a comprehensive data gathering project with the aim of updating the current SFWMP and site water balance model. The SFWMP is scheduled to be revised in June 2015 [Management Plan and Monitoring Program Revision table sighted].
9	Water Releases – Camp Gully	Water releases from the Major Surface Facilities Area to Camp Gully will continue to be monitored in accordance with the requirements of EPL No. 767.	CO	Refer to EPL Audit Checklist, Items 3 and 6.
10	Coal Reject Geochemical Testwork	Periodically over the life of the Project, HCPL will test coal reject material that is produced to confirm that the coal reject geochemistry is generally consistent with that observed to date and does not require the implementation of any specific management measures with respect to reject disposal or surface water management.	CO	In 2014 Metropolitan Coal commissioned Golder Associates to conduct sampling and laboratory analysis of Coal Washery Reject Material to test material compliance with the EPA General Exemption conditions. Report concluded the material was within criteria.
11	Reporting – Mine Operations Plan (MOP)	The MOP will also describe: • areas of particular environmental sensitivity; • land and water management systems;	C	MOP (2012-2019): Section 3.2.4 Surface Water (pp 31 -33) describes surface water related issues and refers to the EP WMPs.
12	Annual Environmental Management Report (AEMR)	An AEMR will be prepared to report on the status of approvals, leases, licences and environmental risk management and environmental control strategies. For the preceding 12 month period, the AEMR will provide a summary of community relations and liaison, mine development and rehabilitation in relation to the MOP. Project environmental performance in relation to the collective conditions of approvals, leases and licences for the previous 12 month period will also be reported.	CO N	• Four Annual Reviews (AEMRs) have been prepared (2010 - 2013). • The ARs address the requirements of this commitment. • The AR2014 was provided for the 2015 audit, however it had not been uploaded onto the Project web page at the time of the audit, as it was still under review.

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

5 Longwalls 23-27 Extraction Plan Approval

	Item	Summary of Requirements	Compliance Status*	Evidence of Implementation
Extraction Plan Approval, Schedule 3, Terms of Approval				
1	Condition 5 Remediation	The Proponent shall develop a Grouting Protocol and Grouting Procedure for proposed remedial grouting works within Waratah Rivulet and/or other watercourses in consultation with OEH, SCA and DRE and submit those documents to the Director-General for approval by 31 July 2014.	A	Metropolitan Coal submitted a letter to DP&E on 30 April 2014 stating that they consider that the Rehabilitation Management Plan adequately describes the Grouting Protocol and Grouting Procedure required by Condition 5. The Rehabilitation Management Plan was prepared in consultation with the DRE and SCA (but not OEH). The Rehabilitation Management Plan was approved as the required Grouting Protocol and Grouting Procedure by the DP&E on 19 August 2014.
2	Condition 6 Remediation	Prior to undertaking any remedial grouting works in accordance with the Grouting Protocol and Grouting Procedure the Proponent shall consult with OEH, SCA, DRE and P&|, and shall then implement the works to the satisfaction of the Director-General.	C	The Rehabilitation Management Plan was approved as the required Grouting Protocol and Grouting Procedure by the DP&E on 19 August 2014.
3	Condition 8 Waratah Rivulet Flow Gauging Station	The Proponent shall ensure that the existing Waratah Rivulet flow gauging station is not subject to subsidence impacts which render it unsuitable for its primary purpose without first constructing, in consultation with SCA, an appropriate alternative flow gauging station further downstream (as close as practicable to the full supply level of Woronora Reservoir) and establishing a flow rating curve over a period of 2 years, to the satisfaction of the Director-General.	CO	Metropolitan Coal is seeking approval to install a gauging station within the Waratah Rivulet to replace the existing SCA owned gauging station, in the event subsidence impacts compromise the hydrological performance of the SCA owned gauging station. Metropolitan Coal has developed a Surface Works Assessment Form for the Waratah Rivulet Replacement Gauging Station, dated January 2015 [sighted]. This was submitted to the SCA on 8 January 2015, and is currently under review.
4	Condition 9 Monitoring and Reporting Requirements	The Proponent shall implement a monitoring and reporting procedure that contains the following elements: a) incident reporting, following any occasion of incident, in accordance with the conditions of consent and/or environment protection licence and/or any requirements in the TARP(s);	CO	Refer to MCoA Audit Checklist, Item 12.

*Compliance Status: C = Compliant, CO = Compliant Ongoing, N = Noted, NC = Non-Compliant, A = Administrative Non-Compliance, N/A = Not active/ Not Applicable

	Item	Summary of Requirements	Compliance Status*	Evidence of Implementation
		c) six-monthly reporting of all impacts and environmental monitoring results, including: • a comprehensive summary of all impacts, including a revised characterisation according to the relevant TARP(s); • any proposed actions resulting from Triggers being met in the TARP, or other actions; • assessment of compliance with all relevant performance measures and indicators; • a comprehensive summary of all quantitative and qualitative environmental monitoring results, including landscape monitoring, water quality data, water flow and pool level data, piezometer readings, etc; and	CO	Metropolitan coal produces six monthly reports. Reports covering period 1 January to 30 June 2014 and 1 July 2014 to 31 December 2014 have been sighted. • Six Monthly Reports Section 2.2 Monitoring. • Six Monthly Reports Section 2.3 Assessment of Environmental Performance. • Six Monthly Reports Section 2.4 TARP Characterisation. The ARs report on impacts and environmental monitoring (Refer to MCoA Audit Checklist, Item 1).
		d) Annual Review reporting, to be based on each two successive six-monthly reports of impacts and environmental monitoring results. A summary of subsidence effects monitoring results should also be included.	CO	Refer to MCoA Audit Checklist, Item 12. Refer to SoC Audit Checklist, Item 1.
5	Condition 10 Independent Environmental Audit	The Applicant shall ensure that the audit team for the Independent Environmental Audit, required under condition 8 of Schedule 7 of approval MP 08_0149, includes suitable experts in the fields of mine subsidence impacts and remediation, upland swamps, stream hydrology and water quality; and carries out a detailed audit of the impacts of mining in Longwalls 20-27.	CO	Refer to MCoA Audit Checklist, Item 14.

Annexure B

Water Quality Data Verification

Advisian

WorleyParsons Group

Advisian
WorleyParsons Group

Table of Contents

Tables

Figures

Advisian
WorleyParsons Group

1 Background and Scope

1.1 Background

In its letter to Metropolitan Mine dated 26 March 2015, the Department of Planning and Environment (DP&E) agreed to "*the verification of previously reported water monitoring results and associated data as part of the upcoming independent environmental audit for the Metropolitan Coal Project*."

Further, "*the Department agrees that the inclusion of this process as part of the independent environmental audit would provide further confidence to the relevant Government agencies and the community that the mine is appropriately recording and monitoring its environmental impacts. The Department requests the company to ensure that detailed review and verification of water monitoring results is included in the upcoming independent environmental audit scope of works*."

DP&E's requirements were confirmed in an email dated 25 May 2015 as follows:

- The primary purpose of the review requested by the Department is to verify that the published data accurately and reasonably reflects the raw data;
- The data review should only concern itself with the historic data itself and whether it has been appropriately interpreted, not with recommendations directed towards improving the adequacy/appropriateness of the indicator triggers;
- The data review should acknowledge that there is a separate process (Umwelt's review) that is dealing with the issue of the adequacy/appropriateness of the indicator triggers;
- The data review should focus on analytes of concern. It does not need to cover all analytes monitored; and
- The analysis and reporting should take account of the fact that the audit report will be a public document and will be of considerable interest to NSW Water (previously Sydney Catchment Authority) and to community groups and individuals.

This Annexure provides the review of Metropolitan Mine's publically available surface water quality data carried out as part of the 2015 Independent Environmental Audit.

1.2 Publicly Available Surface Water Quality Data

The publicly available surface water quality monitoring data and analysis are described in the sections below. The monitoring data is reported by Metropolitan Mine in the 2012, 2013 and 2014 Annual Reviews (AR), (data analysis by Gilbert & Associates), and Environmental Monitoring Summary Reports (which present a summary of the information provided in the Annual Reviews). The relevant reports are available to the public via the company's website: *http://www.peabodyenergy.com/content/417/australia-mining/new-south-wales/metropolitan-mine/approvals-plans-and-reports-metropolitan-mine.*

In the Annual Reviews the monitored parameters are provided in the form of data ranges and plots over the period August 2011 - July 2012 (AR2012) and August 2012 - December 2013 (AR2013). AR2014 provides graphical presentation of monthly data for surface water

quality sampling in water bodies, and tabulated monthly data for monitoring of the mine's surface water facilities over the period January 2014 – December 2014 for the monitored parameters.

1.2.1 Underground Mining Area

Surface water quality sampling is conducted monthly in accordance with the requirements specified in:

- *Longwalls 20-22 Water Management Plan* (as reported in AR2012, AR2013 and AR2014); and
- *Longwalls 23-27 Water Management Plan* (as reported in AR2014).

Water quality parameters sampled include electrical conductivity (EC), pH, redox potential (Eh), dissolved oxygen (DO), turbidity, calcium (Ca), magnesium (Mg), sodium (Na), potassium (K), chloride (Cl), sulphate (SO_4), bicarbonate (HCO_3), total nitrogen (N_{tot}), total phosphorus (P_{tot}), nitrate (NO_3), barium (Ba), strontium (Sr), manganese (Mn), iron (Fe), zinc (Zn), cobalt (Co) and aluminium (Al). Unfiltered water quality samples are also collected at a select number of sites on the Waratah Rivulet, Eastern Tributary and Woronora River and analysed for total iron.

The locations of all monitoring sites are shown on Figure 1 below.

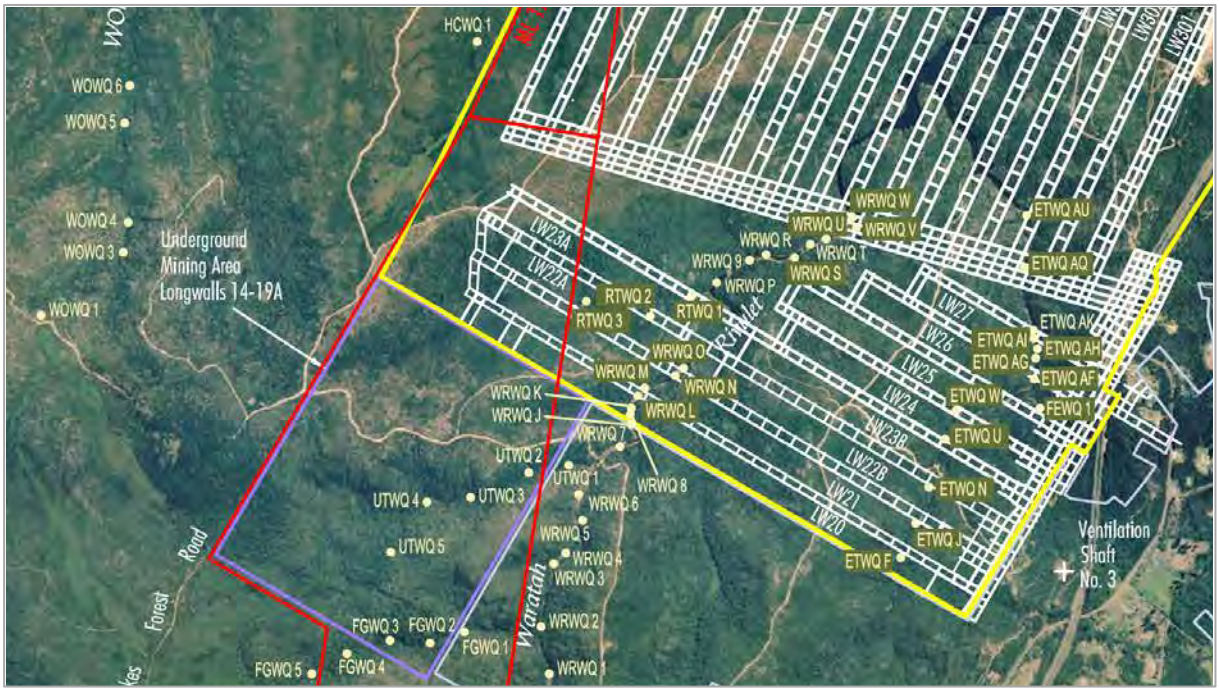


Figure 1: Water Quality Monitoring Sites

The key parameters of interest, as identified in the *Longwalls 20-22 Water Management Plan* and *Longwalls 23-27 Water Management Plan*, are pH, EC, dissolved aluminium, dissolved iron and dissolved manganese. Charts of the water quality monitoring data are presented in the Annual Reviews.

1.2.2 Quality of Water Resources Reaching the Woronora Reservoir

To assess the quality of water reaching the Woronora Reservoir, further analysis is carried out on the data from WRWQ9 (Waratah Rivulet), ETWQ2 (also known as ETWQU) and ETWQ AU (Eastern Tributary), and the Woronora River control site (WOWQ2).

Data from site ETWQ2 is analysed in accordance with the *Longwalls 20-22 Water Management Plan* and data from site ETWQ AU is analysed in accordance with the *Longwalls 23-27 Water Management Plan.*

The data analysis is conducted to assess whether there has been a statistically significant change in the quality of water post mining of Longwall 20. Specifically if:

- any water quality parameters exceed the baseline mean plus two standard deviations for two consecutive months; or
- the sliding 12 month mean for any water quality parameter exceeds the baseline mean plus one standard deviation; and
- there was not a similar increase in the same measure at the control site.

In this context, 'baseline' refers to water quality monitoring that occurred prior undermining of the relevant watercourse by Longwall 20.The Annual Reviews provide plots of the field filtered water quality parameters (dissolved iron, dissolved aluminium and dissolved manganese) collected since the commencement of Longwall 20 compared to pre-mining data for the three sites.

1.2.3 Surface Facilities

Monitoring of surface water quality for the mine surface facilities is carried out in accordance with EPL 767 and the Metropolitan Coal Surface Facilities Water Management Plan.

Surface water quality monitoring is conducted monthly at monitoring point 9 (clean water tank of the Water Treatment Plant), if discharge is occurring to Camp Gully. The location of monitoring point 9 is shown on Figure 2. Water quality parameters monitored at this location include pH, oil and grease and total suspended solids.

Figure 2: Metropolitan Coal Site Surface Facilities

1.3 Methodology

The DP&E requirements (Section 1.1) require the review to verify that the published data accurately and reasonably reflects the raw data. The Department did not require the review to cover all sites and analytes monitored, but advised that the review should focus on the locations and analytes of concern.

This review therefore focuses on the analytes of concern identified in the *Water Management Plans* (pH, EC, dissolved aluminium, dissolved iron and dissolved manganese) at the control water course Woronora River [WOWQ1 (upstream) and WOWQ2 (downstream)], in addition to the following key locations on the undermined watercourses upstream and downstream of the longwalls:

- Waratah Rivulet [WRWQ2 (upstream), WRWQ9 (downstream)];
- Eastern Tributary [ETWQF (upstream), ETWQ2 (or ETWQU), ETWQAU (downstream)]; and
- Honeysuckle Creek [HCWQ1];

With the exception of WOWQ2, the locations of these monitoring sites are identified on Figure 1 above.

This review ('2015 Review') comprises:

- review of a sample of the laboratory reports for the analytes at the key monitoring sites to ensure the raw data has been transcribed correctly;
- assessment of the data used to produce the published plots and statistics in AR2012, AR2013 and AR2014 to identify if any data has been excluded or if there has been any aggregation or weighting of data;
- generation of a sample of the plots and statistics; and
- comparison with the plots provided in AR2012, AR2013 and AR2014, specifically:

- plots of analyte v time for comparison with the published plots. As it is difficult to compare the plots visually, the data on which the plots are based have also been assessed;
- summary table of statistics (range and average) for each of the watercourses based on the key monitoring sites;
- plots of dissolved aluminium, dissolved iron and dissolved manganese (including baseline mean + 2 standard deviations) versus time for WRWQ9, ETWQ2, ETWQ AU, WOWQ2;
- plots of the sliding 12 month mean for dissolved aluminium, dissolved iron and dissolved manganese for WRWQ9, ETWQ2, ETWQ AU, WOWQ2, with baseline mean plus one standard deviation value;
- summary table of statistics (baseline mean + 1 standard deviation, baseline mean + 2 standard deviations) for dissolved aluminium, dissolved iron and dissolved manganese at WRWQ9, ETWQ2, ETWQ AU, WOWQ2; and
- plots of pH, oil and grease and total suspended solids at EPL discharge point 9.

In response to Advisian queries Metropolitan Mine provided clarification of a number of aspects of the data analysis.

1.4 Data Assessed

The 2015 Review is based on the following information, which was provided by Metropolitan Mine:

- laboratory reports for 1 year of data (2014);
- raw data and data used to prepare the published charts and statistics in the Annual Reviews for pH, EC, dissolved aluminium, dissolved iron and dissolved manganese at monitoring sites WRWQ2, WRWQ9, ETWQF, ETWQ2, ETWQAU, HCWQ1, WOWQ1, WOWQ2 from September 2006 to 31 December 2014;
- date of commencement of mining of Longwall 20; and
- monthly data for pH, TSS, oil & grease for discharge point 9 from August 2011 to December 2014 (which includes the data presented in AR2012).

2 Data Verification Analysis

2.1 Verification of Raw Data

Water quality records for 1 January 2014 to 31 December 2014, provided by Metropolitan Mine in spreadsheet form, have been verified against hard copy laboratory reports for the same period. Laboratory reports for sites WRWQ2, WRWQ9, ETWQF, ETWQ2, ETWQAU, HCWQ1, WOWQ1 and WOWQ2 were found to be transcribed correctly to the spreadsheet record.

2.2 Pre-processing of Data for Statistical Analysis

Where the concentration of an analyte is less than the detection limit, the data is presented as '<' the detection limit. If the data is retained with the '<' sign, Excel will treat the value as zero. Generally, such results were altered by removing the '<' sign prior to any statistical analysis or graphical presentation for the Annual Reviews. It should be noted that this treatment of results recorded below the detection limit may bias the analysis upwards. For example, results shown as "<0.01" would be treated as 0.01, when the concentration could be anywhere between zero and 0.01.

Although removal of '<' has been adopted for all data for AR2012 and AR2013, data for AR2014 baseline data for dissolved aluminium was calculated using half the detection limit for:

- Three results for WRWQ9 out of a total of 50 (6%); and
- One result for WOWQ2 out of a total of 35 (3%).

As there are only three WRWQ9 results and one WOWQ2 result which are recorded below the detection limit, any bias would be minor and would not significantly affect the analysis. Refer to Section 2.3.2 for further discussion of baseline statistics. Gilbert & Associates have noted this discrepancy and, for future reporting, will amend this data so that it is consistent with other sites by removing the '<' rather than taking half of the detection limit.

2.3 Underground Mining Area

2.3.1 Summary Statistics

Summary statistics (range and arithmetic average) for all sampling locations on the Eastern Tributary, Waratah Rivulet and Woronora River for pH, EC, Mn, Fe and Al are presented in Table 20 and Table 26 of AR2012 and AR2013 respectively. These statistics are reproduced in Table 1 to Table 3 below.

The summary statistics cover all available data up until the end of the period covered by each annual review (i.e include baseline data). However, as discussed further in Section 2.3.2, additional baseline data was brought to the attention of Metropolitan Mine by the Sydney Catchment Authority (SCA) following AR2013. Notes below each of the tables below indicate the period considered in each Annual Review.

Table 20 and Table 26, presented in AR2012 and AR2013 respectively, are identical. Metropolitan Mine has advised that an error was made in AR2013 in that the water quality summary presented was not updated from AR2012 to include water quality results for the 2013 reporting period. Metropolitan Mine has provided updated summary statistics for the AR2013 period, which is shown in the last two columns of Table 1 to Table 3.

Summary statistics for the identified key water quality monitoring sites have been calculated as part of the 2015 Review and are provided in Table 1 to Table 3. These statistics have been calculated over the same period as for each Annual Review (see notes below each table), but only consider a limited number of the key sites identified in Section 1.3 above, while the Annual Reviews include data from all sites on each creek.

Although tabulated statistics are not provided in AR2014, for completeness, this review provides summary statistics for the AR2014 period.

2.3.2 Analysis of Summary Statistics

The summary statistics generated for this review relate to a specific number of selected locations (as described in Section 1.3). Compared to the data quoted in the Annual Reviews, which included all sites of a particular watercourse, the 2015 review was found to be consistent with statistics reported in AR2012 and AR2013. As stated above, the summary statistics reported in AR2013 were not updated from AR2012 to include water quality results for the 2013 reporting period. In relation to the AR2013 summary statistics table, AR2013 stated:

> *Summary statistics from all sampling locations on the Eastern Tributary, Waratah Rivulet and Woronora River are presented in Table 26. Concentrations were relatively consistent between the sites with all watercourses experiencing spikes or pulses throughout the time series. The Waratah Rivulet appeared to have higher dissolved manganese concentrations and the Woronora River higher dissolved aluminium concentrations.*

These statements remain correct for the updated summary statistics provided by Metropolitan Mine (last two columns of Table 1 to Table 3).

Table 1: Surface Water Quality Summary Statistics – Eastern Tributary

	Advisian 2015 Review Statistics (ETWQU, ETWQAU, ETWQF)						Presented Statistics AR2012 and AR2013[1] (12 sampling sites)		Metropolitan Mine Revised Statistics AR2013[2] (12 sampling sites)	
	AR2012 period[1]		AR2013 period[2]		AR2014 period[3]					
Parameter	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average
ph (field)	5.31 - 7.75	6.66	5.31 - 7.75	6.67	5.31 - 7.75	6.69	4.69 – 9.50	6.74	4.69 – 9.50	6.77
EC (field) (µS/cm)	47.2 – 310.0	159.5	47.2 – 310.0	159.3	47.2 – 310.0	162.7	47.2 – 310.0	157.8	14.5 – 310.0	161.9
Mn (mg/L)	0.005 - 0.190	0.070	0.005 - 0.190	0.064	0.005 - 0.190	0.064	0.005 – 0.290	0.052	0.005 – 0.910	0.054
Fe (mg/L)	0.081 - 0.780	0.313	0.081 - 0.780	0.306	0.081 – 1.000	0.315	0.027 – 1.0	0.303	0.027 – 1.0	0.307
Al (mg/L)	0.011 - 0.110	0.049	0.011 - 0.110	0.050	0.011 - 0.110	0.046	0.011 – 0.2	0.052	0.011 – 0.2	0.050

1 January 2010 - July 2012
2 January 2010 - December 2013
3 January 2010 - December 2014

Table 2: Surface Water Quality Summary Statistics – Waratah Rivulet

	2015 Review Statistics (WRWQ2, WRWQ9)						Presented Statistics AR2012 and AR2013[1] (10 sampling sites)		Metropolitan Mine Revised Statistics AR2013[2] (10 sampling sites)	
	AR2012 period[1]		AR2013 period[2]		AR2014 period[3]					
Parameter	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average
ph (field)	5.44 - 8.39	6.72	5.44 - 9.13	6.79	5.44 - 9.13	6.85	5 – 8.39	6.66	4.48 – 9.4	6.69
EC (field)(µS/cm)	87.0 – 306.0	182.9	41.5 – 306.0	181.5	41.5 – 320.0	187.2	84 – 306	177.78	84 – 306	177.18
Mn (mg/L)	0.015 - 0.280	0.071	0.015 - 0.280	0.073	0.010 - 0.280	0.072	0.015 – 1.0	0.11	0.015 – 1.0	0.12
Fe (mg/L)	0.043 - 1.600	0.408	0.043 - 1.600	0.403	0.030 - 1.600	0.397	0.034 – 2.9	0.47	0.034 – 2.9	0.46
Al (mg/L)	<0.001 - 0.095	0.031	<0.001 - 0.095	0.032	<0.001 - 0.180	0.032	0.002 – 0.095	0.03	0.002 – 0.10	0.03

1 January 2008 - July 2012
2 January 2008 - December 2013
3 September 2006 - December 2014 (including additional baseline data – see Section 2.3.2)

Table 3: Surface Water Quality Summary Statistics – Woronora River

	2015 Review Statistics (WOWQ1, WOWQ2)						Presented Statistics AR2012 and AR2013[1] (6 sampling sites)		Metropolitan Mine Revised Statistics AR2013[2] (6 sampling sites)	
	AR2012 period[1]		AR2013 period[2]		AR2014 period[3]					
Parameter	Range	Average	Range	Average	Range	Average	Range	Average	Range	Average
ph (field)	2.42 - 8.48	5.46	2.42 - 8.48	5.49	2.42 - 8.48	5.60	2.42 – 8.48	5.46	2.42 – 8.48	5.34
EC (field) (µS/cm)	75.0 - 234.7	154.4	75.0 - 234.7	155.3	75.0 – 279.0	157.1	75 – 245	149.31	75 - 245	149.31
Mn (mg/L)	0.001 - 0.100	0.026	0.001 - 0.100	0.026	0.001 - 0.100	0.025	0.001 – 0.18	0.05	0.001 – 0.18	0.05
Fe (mg/L)	0.012 – 15.000	0.530	0.012 – 15.000	0.475	0.012 – 15.000	0.441	0.012 – 15	0.37	0.012 - 15	0.37
Al (mg/L)	0.008 - 0.420	0.122	0.008 - 0.420	0.116	0.008 - 0.420	0.113	0.008 – 0.42	0.10	0.008 – 0.42	0.10

1 January 2008 - July 2012
2 January 2008 - December 2013
3 January 2008 - December 2014

2.3.3 Analyte vs Time Plots

Charts of key water quality parameters (pH, electrical conductivity, dissolved aluminium, dissolved iron and dissolved manganese) are presented in AR2012, AR2013 and AR2014. The water quality data was presented in the same format for AR2012 and AR2013, with summary results from all monitoring sites presented on the same chart. In AR2014, separate charts were provided for each main watercourse. Water quality results for Honeysuckle Creek (HCWQ1) are only presented in AR2014.

Plots for these key parameters for the select water quality monitoring sites have been generated as part of the 2015 Review. The plots generated for the 2015 review are presented in comparison to sample plots from AR2013 and AR2014 in Figure 3 to Figure 32 below. The plots generated for the AR2014 comparison have focused on Waratah Rivulet and Honeysuckle Creek.

The 2015 Review has focused on a number of select monitoring sites which comprise a sub-set of the data plotted in the graphs in the Annual Reviews. For comparison purposes, plots of the data derived for the 2015 Review (Figure 3 to Figure 32) have adopted similar colours to corresponding sites shown on plots in the Annual Reviews.

2.3.4 Analysis of Analyte vs Time Plots

Due to the amount of data included on the plots it is difficult to make direct comparisons. Notwithstanding, apart from Figure 15 and Figure 16 the figures generated for the 2015 Review are consistent with those presented in the Annual Reviews. In Figure 16 the data for dissolved aluminium for WOWQ1 is not shown in AR2013 despite being labelled within the figure's legend.

It should also be noted that the AR2013 electrical conductivity plot (Figure 10), in addition to the AR2014 electrical conductivity plot for Honeysuckle Creek (Figure 14) show field EC, while the AR2014 electrical conductivity plot for Woronora River (Figure 12) shows lab EC. The electrical conductivity charts generated by this review (Figure 9, Figure 11 and Figure 13) show lab or field EC, depending on what is displayed on the corresponding chart in the annual reviews.

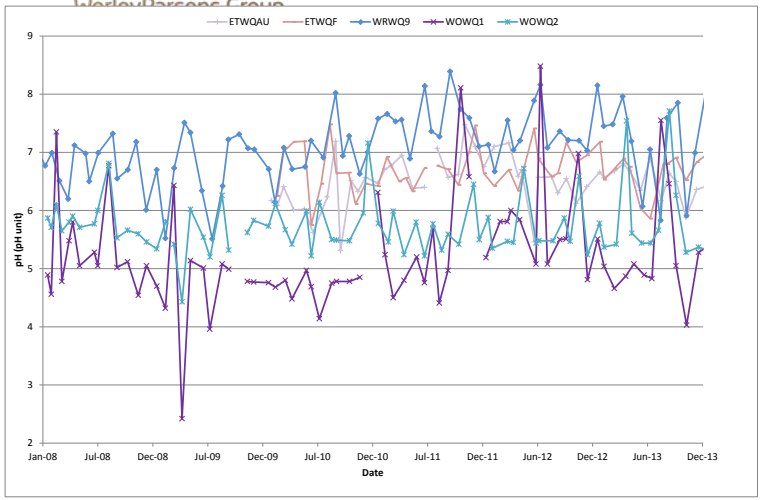


Figure 3: pH (2015 review – AR2013 period)

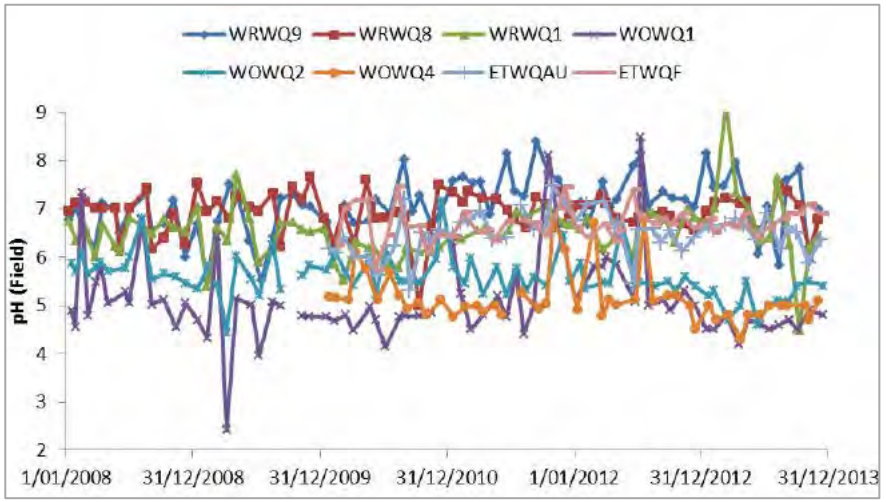


Figure 4: pH (AR2013)

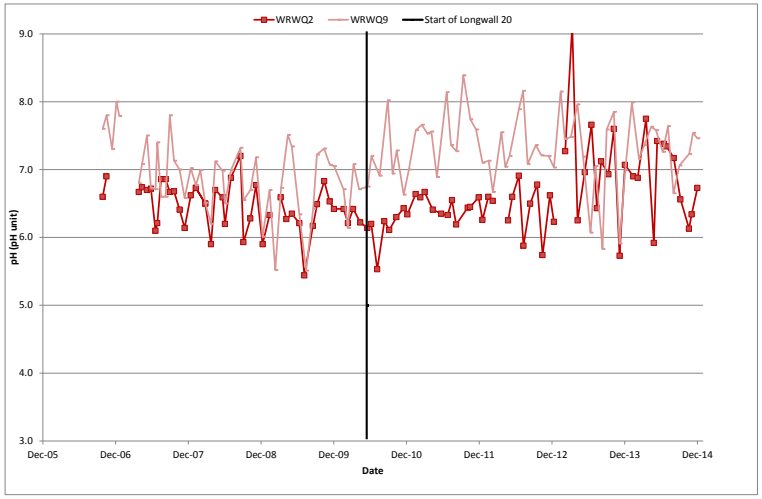


Figure 5: pH (2015 review – AR2014 period)

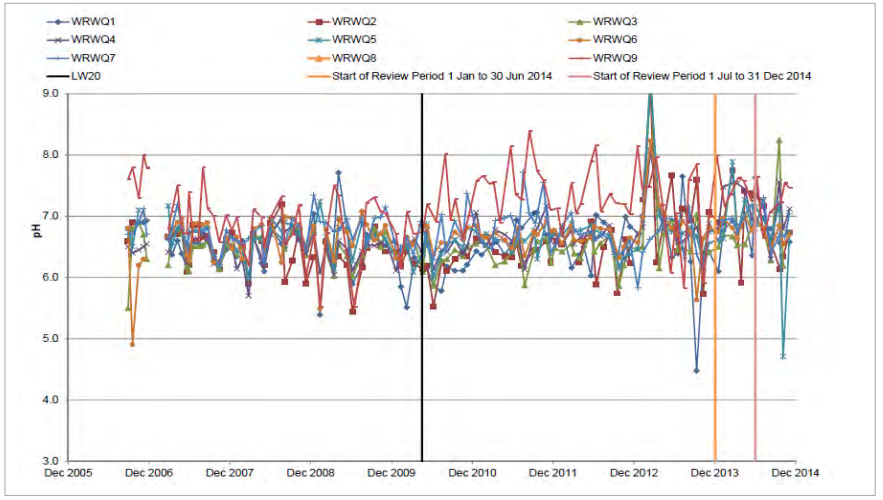


Figure 6: pH (AR2014)

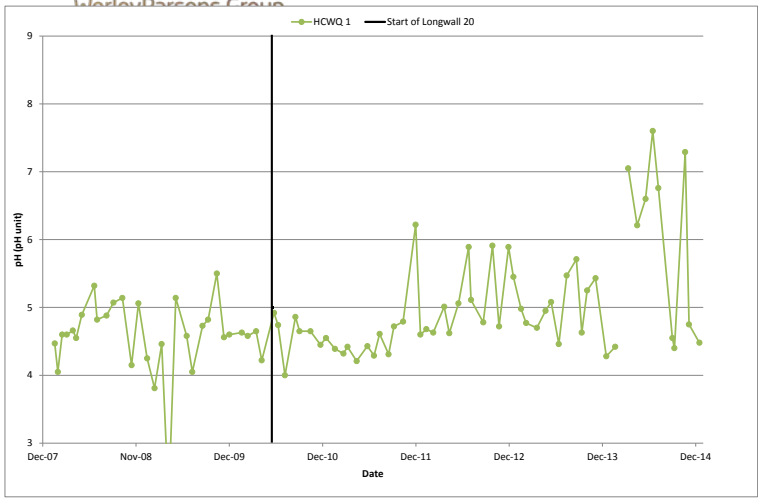


Figure 7: pH (2015 review – HCWQ 1, AR2014 period)

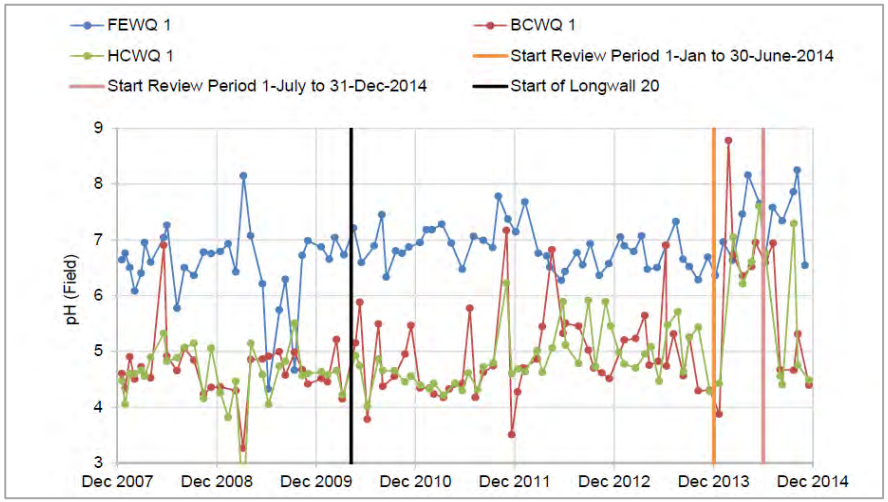


Figure 8: pH (AR2014)

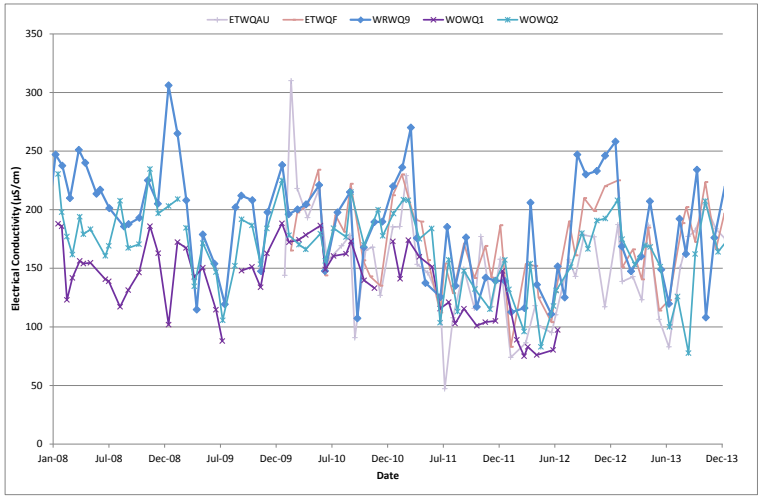


Figure 9: Electrical Conductivity- field (2015 review – AR2013 period)

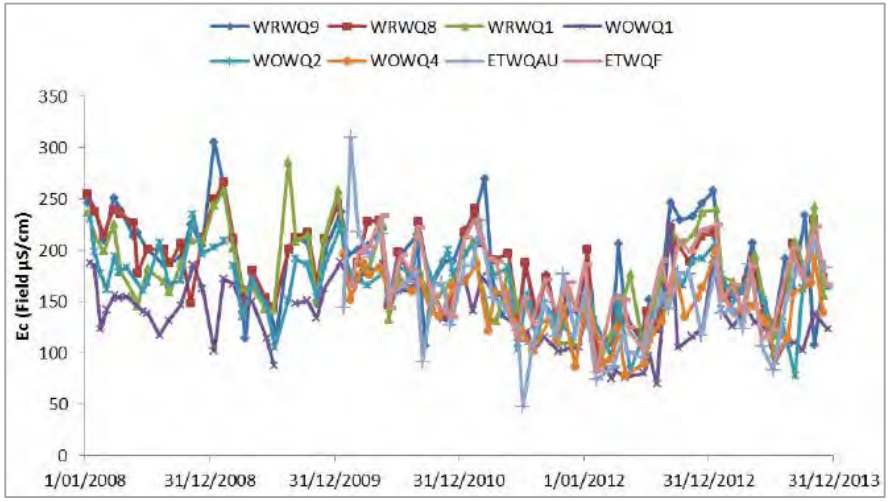


Figure 10: Electrical Conductivity- field (AR2013)

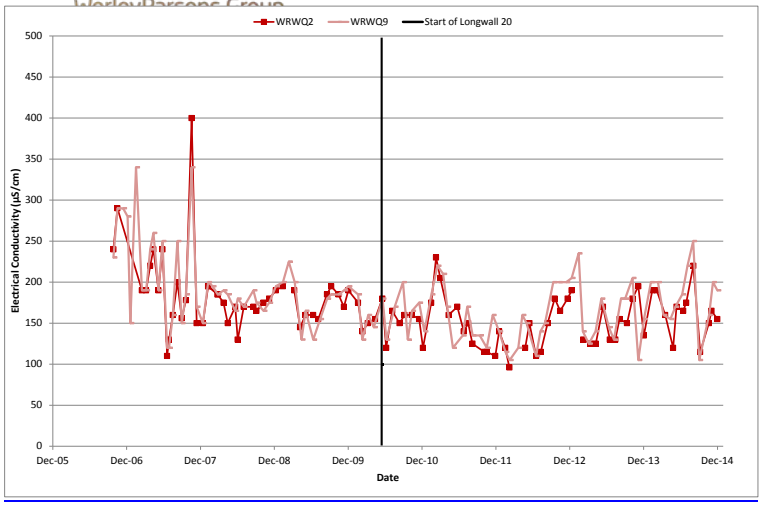


Figure 11: Electrical Conductivity - lab (2015 review - AR2014 period)

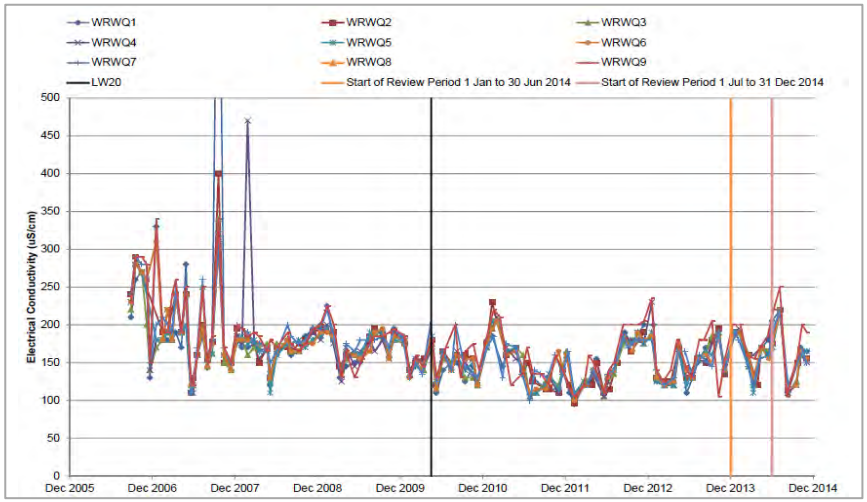


Figure 12: Electrical Conductivity - lab (AR2014)

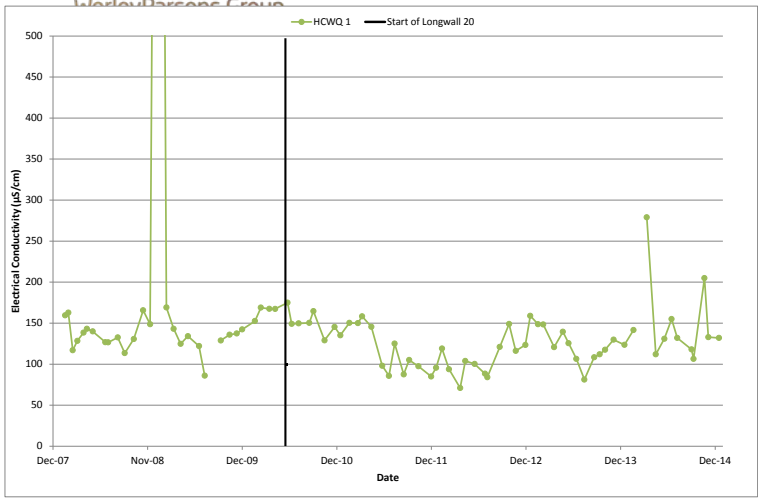


Figure 13: Electrical Conductivity -field (2015 review – HCWQ1, AR2014 period)

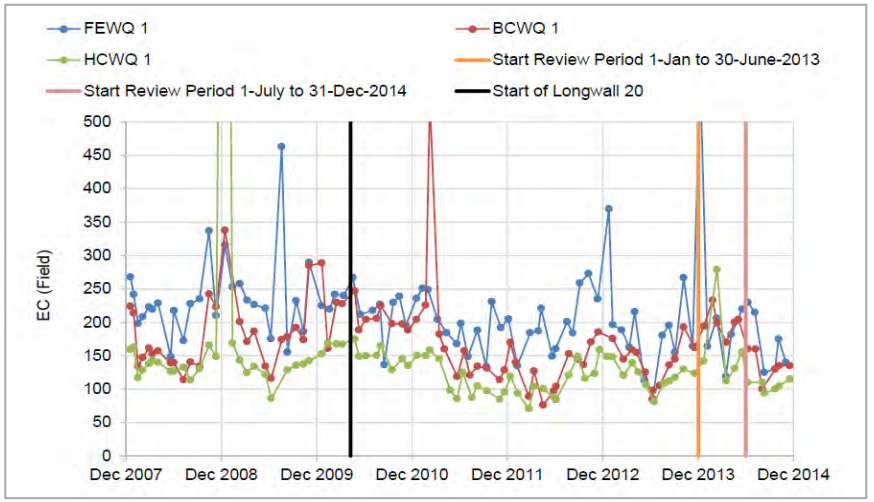


Figure 14: Electrical Conductivity - field (AR2014)

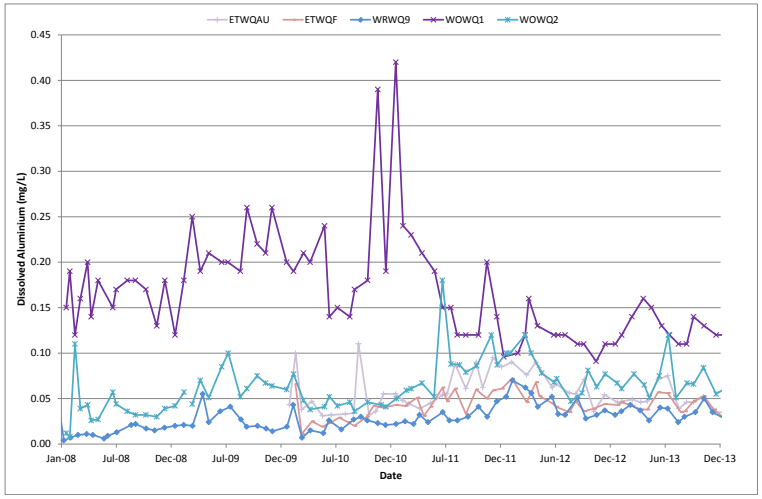


Figure 15: Dissolved Aluminium (2015 review – AR2013 period)

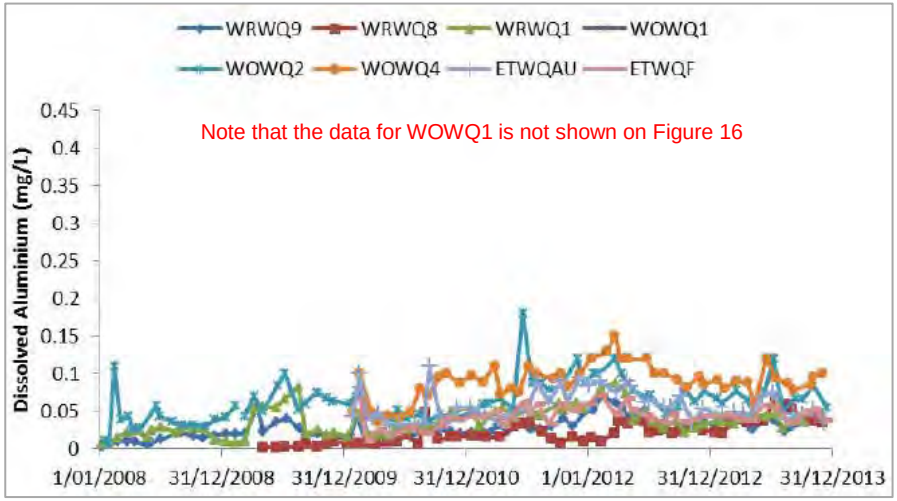


Figure 16: Dissolved Aluminium (AR2013)

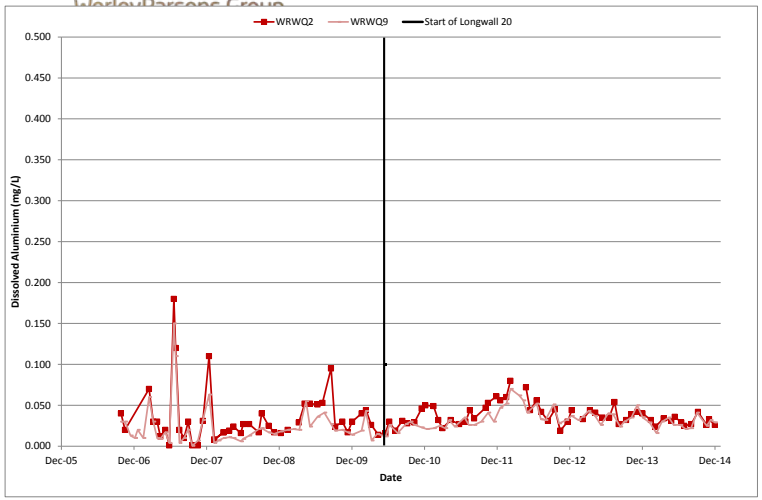


Figure 17: Dissolved Aluminium (2015 review – AR2014 period)

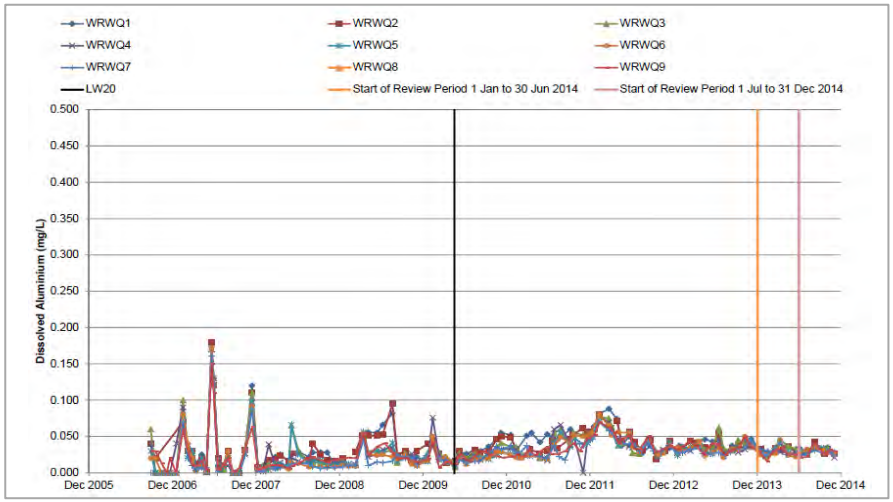


Figure 18: Dissolved Aluminium (AR2014)

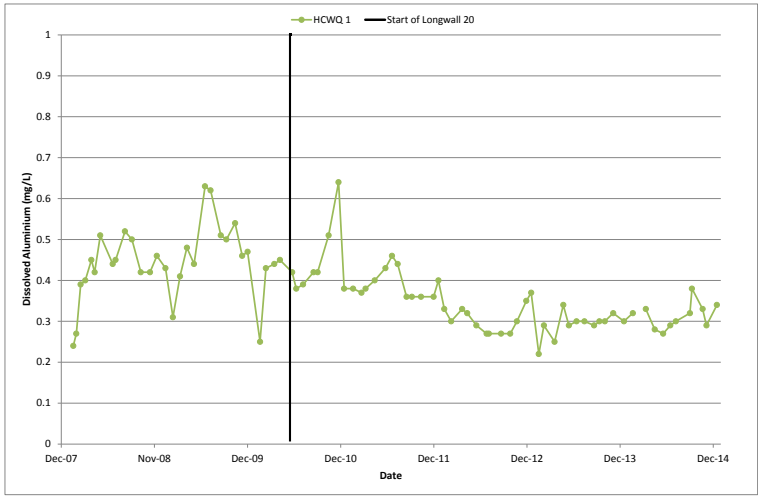


Figure 19: Dissolved Aluminium (2015 review – HCWQ 1, AR2014 period)

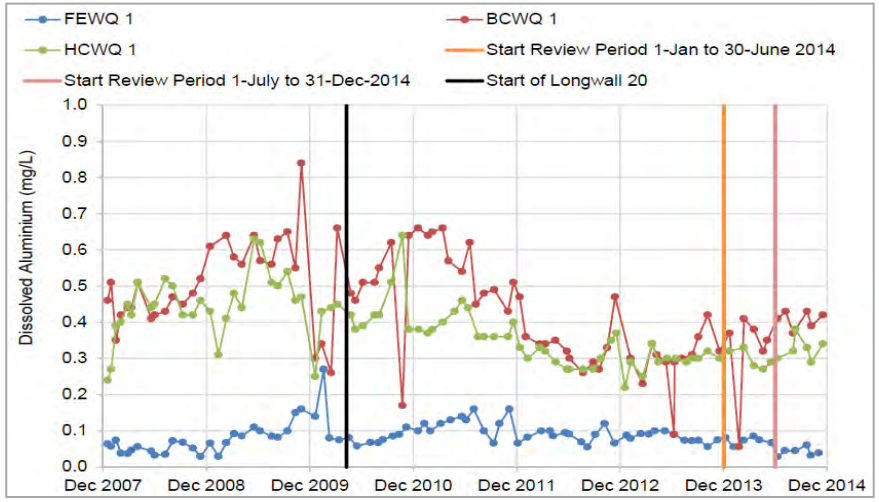


Figure 20: Dissolved Aluminium (AR2014)

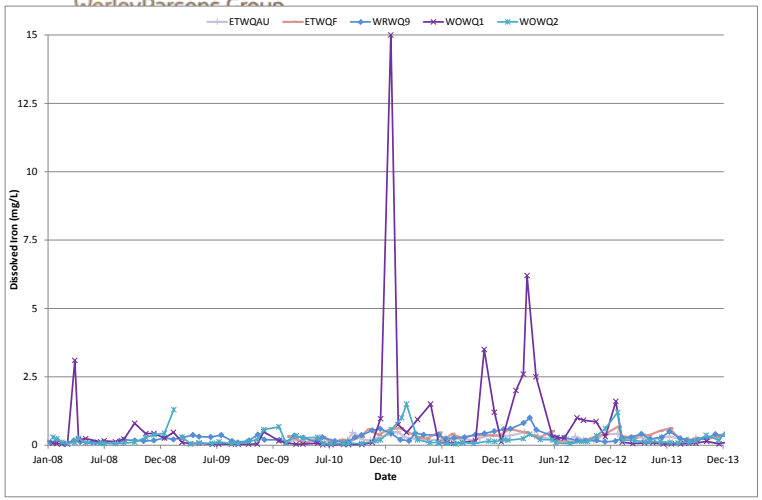


Figure 21: Dissolved Iron (2015 review – AR2013 period)

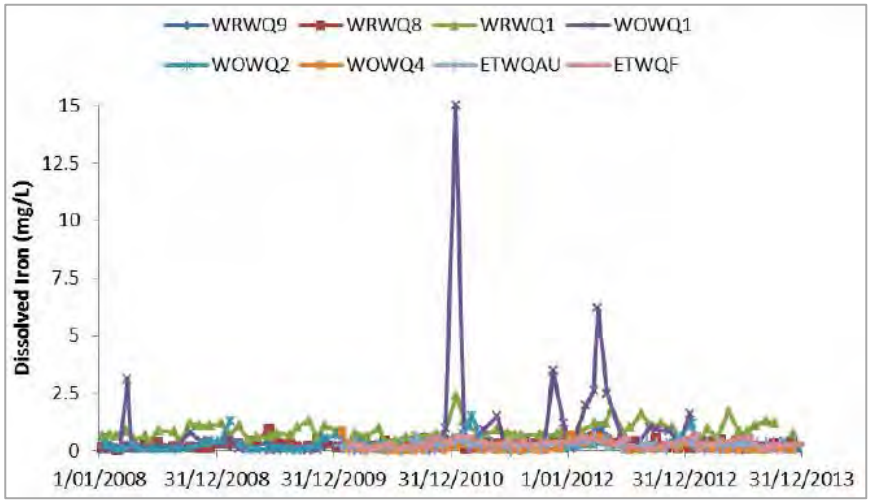


Figure 22: Dissolved Iron (AR2013)

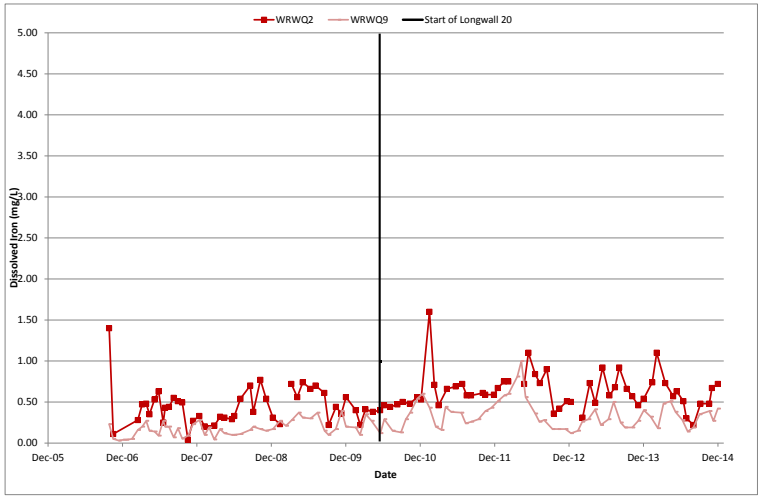


Figure 23: Dissolved Iron (2015 review – AR2014 period)

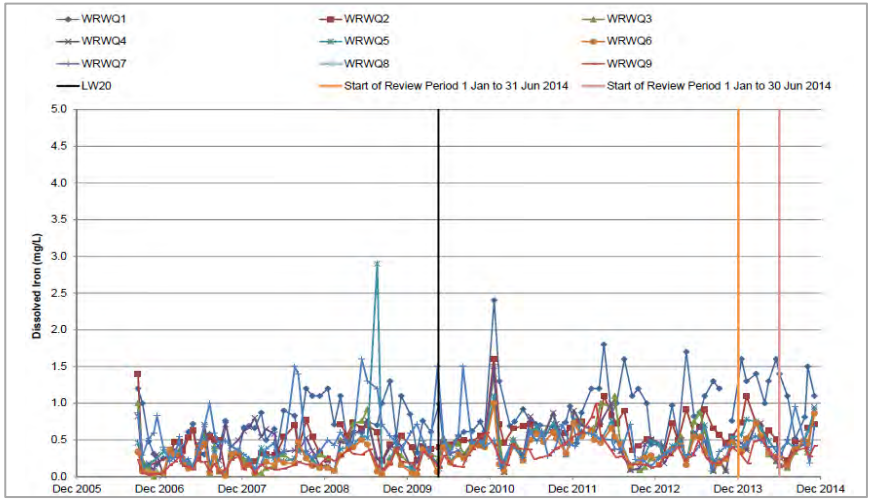


Figure 24: Dissolved Iron (AR2014)

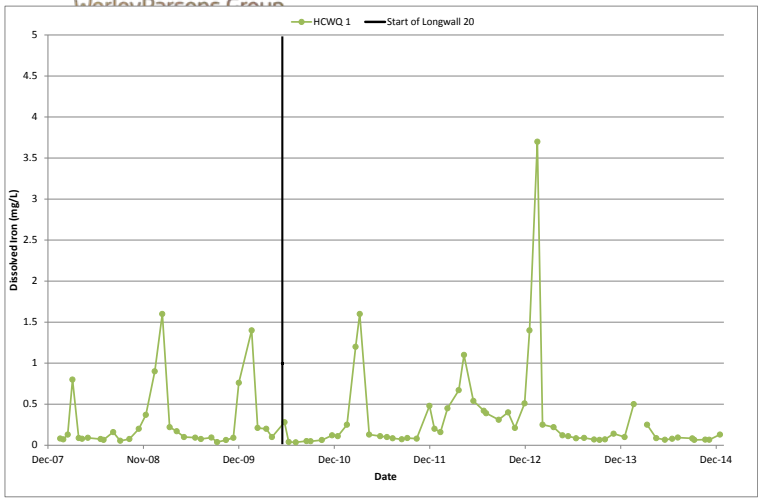


Figure 25: Dissolved Iron (2015 review – HCWQ 1, AR2014 period)

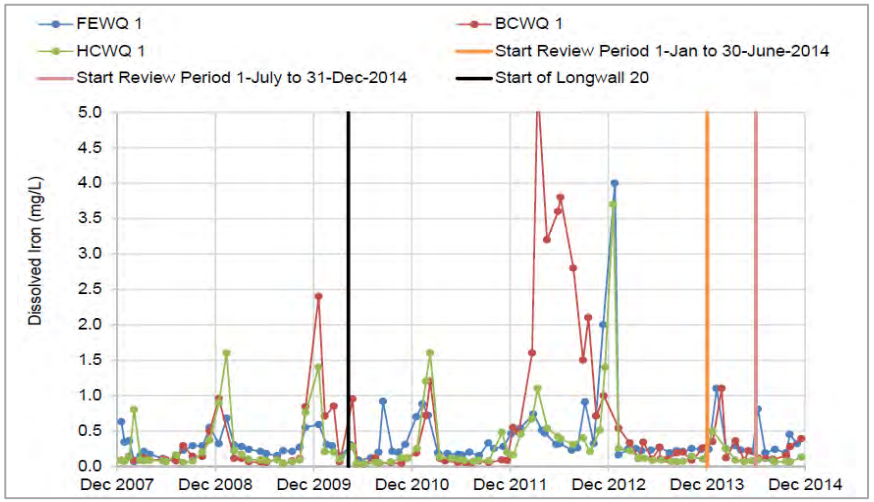


Figure 26: Dissolved Iron (AR2014)

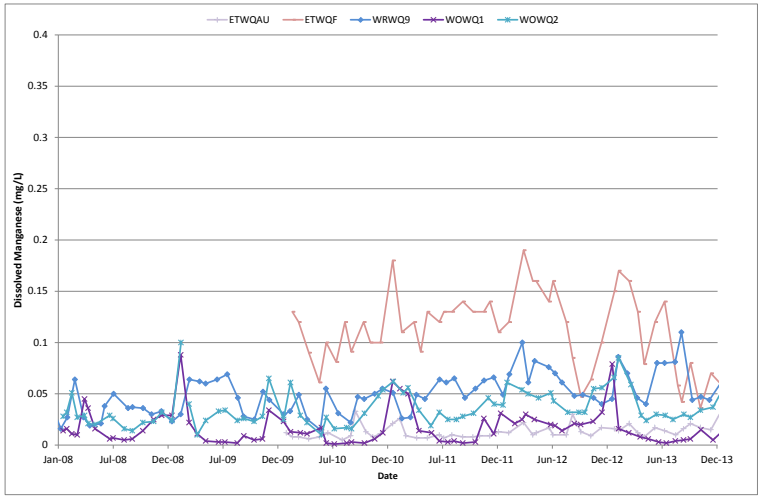


Figure 27: Dissolved Manganese (2015 review – AR2013 period)

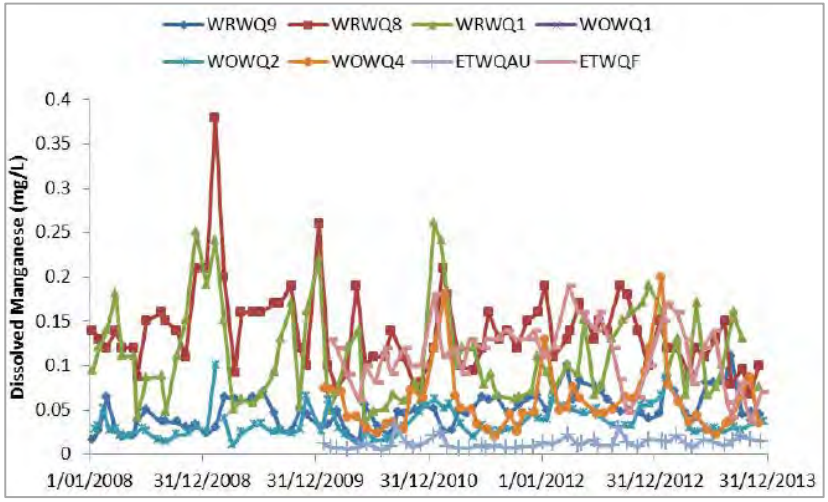


Figure 28: Dissolved Manganese (AR2013)

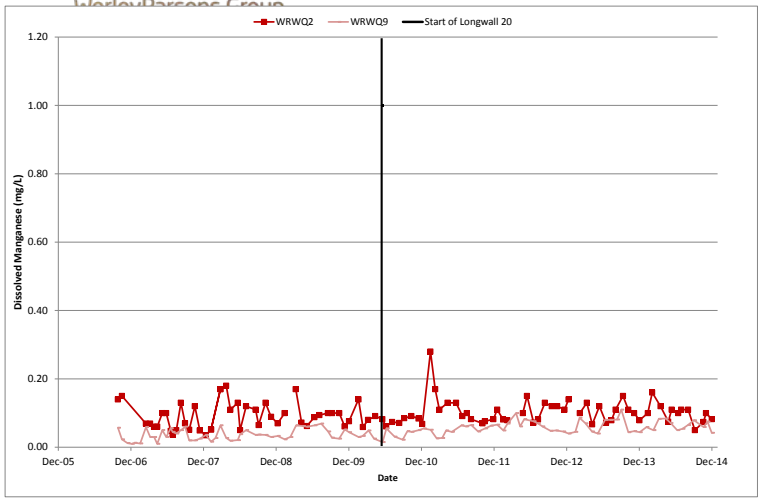


Figure 29: Dissolved Manganese (2015 review – AR2014 period)

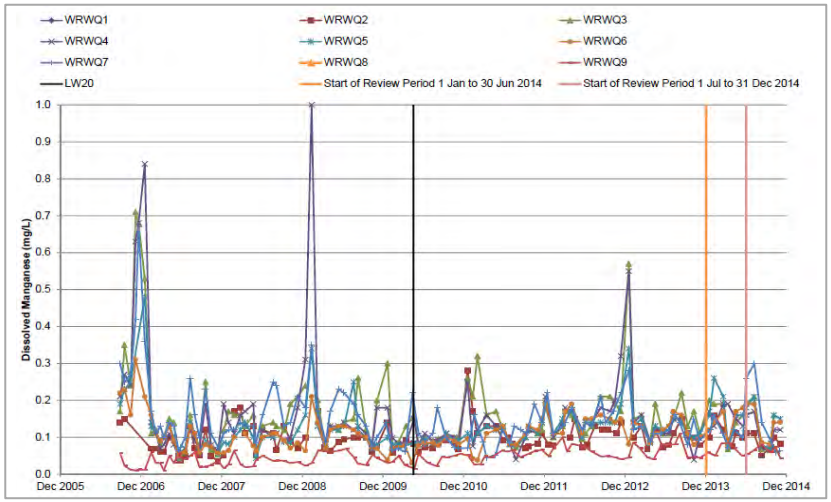


Figure 30: Dissolved Manganese (AR2014)

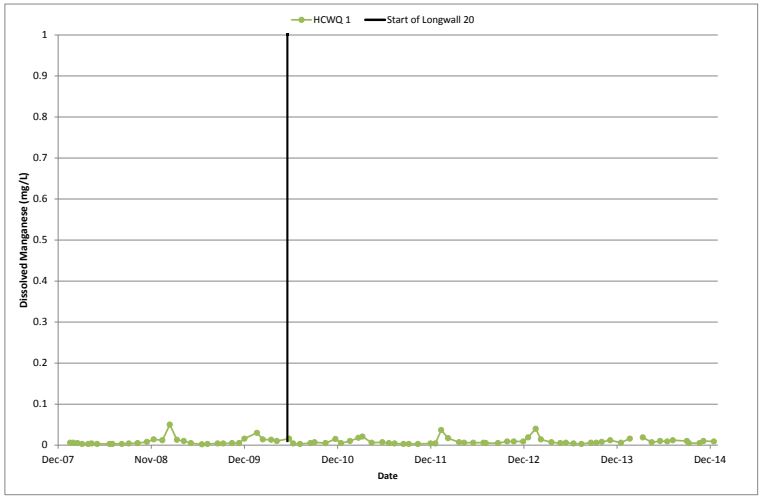


Figure 31: Dissolved Manganese (2015 review – HCWQ 1, AR2014 period)

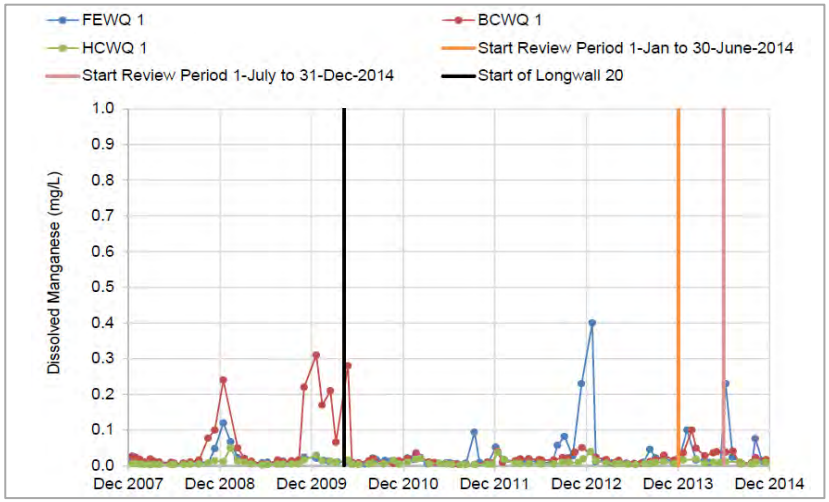


Figure 32: Dissolved Manganese (AR2014)

2.4 Quality of Water Resources Reaching the Woronora Reservoir

2.4.1 Performance Indicator

The data analysis presented in the Annual Reviews is conducted to assess whether the following performance indicator has been exceeded:

> *Changes in the quality of water entering Woronora Reservoir are not significantly different post-mining compared to pre-mining concentrations that are not also occurring at control site WOWQ2.*
>
> *Consistent with the Water Management Plan, this performance indicator is considered to have been exceeded if data analysis indicates a statistically significant change in the quality of water post-mining of Longwall 20.*
>
> *Specifically if:*
>
> - *any water quality parameters exceed the baseline mean plus two standard deviations for two consecutive months; or*
> - *the sliding 12 month mean for any water quality parameter exceeds the baseline mean plus one standard deviation; and*
> - *there was not a similar increase in the same measure(s) at the control site.*

2.4.2 Calculation of Baseline Statistics

Consistent with the Water Management Plans, natural logarithm (log10) transformations have been used to calculate the baseline mean (geometric mean) and standard deviations for analysis of dissolved metals (aluminium, iron and manganese).

The original "baseline" period adopted for the data analysis presented in the Annual Reviews is the period prior to the commencement of Longwall 20 on 19 May 2010. As monitoring in the Eastern Tributary commenced in January 2010, only four readings were available for inclusion in the original baseline dataset. Therefore, in recognition of the fact that Longwall 20 would have no impact on Eastern Tributary in May 2011, an "extended baseline" was adopted, as listed in Table 4. For comparison with monitoring data for Eastern Tributary an extended baseline period has also been adopted for Woronora River.

Table 4: Baseline Data Periods

Monitoring Site	Baseline Period (AR2012, AR2013 & AR2014)	Extended Baseline Period (AR2014)
WRWQ9	September 2006 – May 2010	N/A
WOWQ2 (comparison with WRWQ9)	October 2007 – May 2010	N/A
ETWQ2/ETWQU, ETWQAU	January 2010 – May 2010	January 2010 – May 2011

Monitoring Site	Baseline Period (AR2012, AR2013 & AR2014)	Extended Baseline Period (AR2014)
WOWQ2 (comparison with ETWQ2/ETWQU, ETWQAU)	October 2007 – May 2010	October 2007 – May 2011

The geometric mean plus one standard deviation and the geometric mean plus two standard deviations (trigger values) for the baseline periods for each station are presented in AR2012 and AR2013 and reproduced in Table 5 below. These trigger values have been calculated as part of this 2015 Review and are also presented in Table 5.

Table 5: Trigger Values presented in AR2012 and AR2013

	Dissolved Aluminium [mg/L]		Dissolved Iron [mg/L]		Dissolved Manganese [mg/L]	
	2015 Review	AR2012 & AR2013	2015 Review	AR2012 & AR2013	2015 Review	AR2012 & AR2013
Waratah Rivulet (WRWQ9)						
Baseline mean plus one standard deviation	0.041 ↑	0.030	0.284 ✓	0.284	0.055 ↑	0.054
Baseline mean plus two standard deviations	0.104 ↑	0.055	0.544 ✓	0.544	0.092 ↑	0.082
Eastern Tributary (ETWQ2/ ETWQU)						
Baseline mean plus one standard deviation	0.071 ↓	0.082	0.491 ↓	0.545	0.086 ↑	0.081
Baseline mean plus two standard deviations	0.135 ↓	0.157	0.769 ↓	0.898	0.172 ↑	0.118
Woronora River (WOWQ2)						
Baseline mean plus one standard deviation	0.094 ↓	0.097	0.324 ↓	0.326	0.042 ↓	0.043
Baseline mean plus two standard deviations	0.244 ↓	0.252	0.741 ↓	0.754	0.064 ↓	0.065

Notes: ↑ - recalculated trigger value greater than AR2012 and AR2013 trigger value
↓ - recalculated trigger value less than AR2012 and AR2013 trigger value
✓ - recalculated trigger value the same as AR2012 and AR2013 trigger value

The results presented in Table 5 indicate that there are some inconsistencies between the statistics calculated for this 2015 Review and the statistics presented in AR2012 and AR2013. Based on clarification provided by Metropolitan Mine, these discrepancies are due to the following:

- dissolved aluminium and manganese samples between September 2006 and December 2007 for WRWQ9 were not included in the calculation of the baseline means in AR2012 and AR2013 (brought to the attention of Metropolitan Mine by the SCA following the 2013 Annual Review);

- one data point was not included for dissolved iron, aluminium and manganese for the calculation of the ETWQ2/ETWQU baseline means in AR2012 and AR2013 (database management error); and
- one data point was not included for dissolved iron, aluminium and manganese for the calculation of the WOWQ2 baseline means in AR2012 and AR2013 (database management error). This data point was brought to Metropolitan Coal's attention as a result of this review.

Metropolitan Mine has advised that these inconsistencies occurred as a result of a change in format when data received from the specialist sampling consultant was transferred into Gilbert & Associate spreadsheets. The discrepancies were noted by Gilbert & Associates, and the WRWQ9 baseline has been rectified in the preparation of AR2014. Although the extended baseline period (January 2010 – May 2011) for ETWQ2 uses the additional data point previously not included, the baseline period (October 2007 – May 2010) was not updated from AR2012 and AR2013 to include the missing data point.

The impacts on the trigger values can be summarised as follows:

- for WRWQ9, the recalculated trigger values are either the same or higher than those presented in AR2012 and AR2013;
- for ETWQ2/ETWQU, the recalculated trigger values for dissolved aluminium and iron are lower than those presented in AR2012 and AR2013 and dissolved manganese is higher than those presented in AR2012 and AR2013; and
- for WOWQ2 the recalculated trigger values are all marginally lower than those presented in AR2012 and AR2013.

Where the recalculated trigger values for site WRWQ9 or ETWQ2/ETWQU are higher, the number of previously reported exceedances may be reduced (i.e. if additional exceedances occurred). Conversely, where the recalculated trigger values for site WRWQ9 or ETWQ2/ETWQU are lower, there is potential for historic exceedances to not have been identified. However, inspection of the data indicates that there have been no unidentified historic exceedances (i.e. no additional exceedances occurred). Further discussion of the implications of these discrepancies is provided below.

2.4.3 Comparison of Dissolved Metal Concentrations with Baseline Mean + 2 Standard Deviations

2.4.3.1 AR2012

AR2012 reported that:

> *Dissolved aluminium and dissolved iron concentrations exceeded the baseline mean plus 2 standard deviations on two or more consecutive months during the review period in the Waratah Rivulet at site WRWQ9.*
>
> *Specifically, dissolved aluminium exceeded the trigger value on the three consecutive samples collected between 9/2/2012 and 12/4/2012 (0.07 mg/L, 0.062 mg/L and 0.056 mg/L, respectively).*

> *Dissolved iron concentrations exceeded the trigger value on the five consecutive samples collected between 19/1/2012 and 3/5/2012 (0.58 mg/L, 0.6 mg/L, 0.81 mg/L, 1 mg/L and 0.56 mg/L, respectively).*
>
> *Dissolved aluminium, iron and manganese concentrations at site ETWQ2 remained below the baseline mean plus 2 standard deviations level.*

A review was carried out for the reported exceedance of dissolved aluminium and iron concentrations, in accordance with the Water Management Plans. The review concluded that the performance measure was not exceeded.

The 2015 Review of these results compared to the recalculated trigger value (baseline mean plus 2 standard deviations) for dissolved aluminium (0.104 mg/L) means that there was not actually any exceedances for this parameter at WRWQ9 in the AR2012 review period. There was no change in the trigger value for dissolved iron at WRWQ9, so the exceedances are consistent with those reported AR2012.

Analysis of the data indicates that the reduced trigger values for ETWQ2 would not have resulted in any exceedances in the review period.

2.4.3.2 AR2013

AR2013 reported that:

> *There were no exceedances of the baseline mean plus two standard deviations for two consecutive months or more in Waratah Rivulet at WRWQ9. There were also no exceedances of the baseline mean plus two standard deviations for dissolved aluminium or dissolved iron in Eastern Tributary at ETWQ2 during the reporting period.*
>
> *There was an exceedence of the baseline mean plus two standard deviations level for two months during the reporting period for dissolved manganese in Eastern Tributary at ETWQ2, i.e. during February 2013 and March 2013. However, there was an exceedance of the baseline mean plus two standard deviations level for dissolved manganese for two consecutive months in Woronora River at WOWQ2, i.e. during January 2013 and February 2013. Therefore, the reported concentrations of dissolved manganese during February and 2013 and March 2013 do not constitute an exceedance of the performance indicator for the quality of water reaching Woronora Reservoir.*
>
> *There were no exceedances of the baseline mean plus two standard deviations levels for two consecutive months for dissolved aluminium and dissolved iron at the control site WOWQ2 during the reporting period.*

Review of these findings compared to the recalculated trigger values indicates that the baseline mean plus two standard deviations level of dissolved manganese was not exceeded at ETWQ2. There were no impacts on the other findings reported in AR2013.

2.4.3.3 Plots

Plots of dissolved metal concentrations (aluminium, iron and manganese) plotted with the baseline mean plus two standard deviations for sites WRWQ9, ETWQ2/ETWQU and WOWQ2 are presented in AR2012, AR2013 and AR2014. In addition, charts of dissolved metal concentrations compared to the baseline data for site ETWQAU is presented are AR2014.

The plots for the 2014 data have been generated for this 2015 Review and are presented, together with the corresponding plots from AR2014, in Figure 33 to Figure 56. The plots generated for the 2015 review include the revised baseline means plus two standard deviations presented in Table 6.

Table 6: Trigger Values Displayed in AR2014 Plots

	Dissolved Aluminium [mg/L]		Dissolved Iron [mg/L]		Dissolved Manganese [mg/L]	
	2015 Review	AR2014	2015 Review	AR2014	2015 Review	AR2014
Waratah Rivulet (WRWQ9)						
Baseline mean plus one standard deviation	0.041 ✓	0.041	0.284 ✓	0.284	0.055 ✓	0.055
Baseline mean plus two standard deviations	0.104 ✓	0.104	0.544 ✓	0.544	0.092 ✓	0.092
Eastern Tributary (ETWQ2/ ETWQU)						
Baseline (up to May 2010)						
Baseline mean plus one standard deviation	0.071 ↓	0.082	0.491 ↓	0.545	0.086 ↑	0.081
Baseline mean plus two standard deviations	0.135 ↓	0.157	0.769 ↓	0.898	0.172 ↑	0.118
Extended baseline (up to May 2011)						
Baseline mean plus one standard deviation	0.060 ✓	0.060	0.522 ✓	0.522	0.081 ✓	0.081
Baseline mean plus two standard deviations	0.091 ✓	0.091	0.920 ✓	0.920	0.131 ✓	0.131
Eastern Tributary (ETWQ AU)						
Baseline (up to May 2010)						
Baseline mean plus one standard deviation	0.081✓	0.081	0.215✓	0.215	0.011✓	0.011
Baseline mean plus two standard deviations	0.126✓	0.126	0.302✓	0.302	0.015✓	0.015
Extended baseline (up to May 2011)						
Baseline mean plus one standard deviation	0.065 ✓	0.065	0.336 ✓	0.336	0.017 ✓	0.017
Baseline mean plus two standard deviations	0.094 ✓	0.094	0.543 ✓	0.543	0.029 ✓	0.029

	Dissolved Aluminium [mg/L]		Dissolved Iron [mg/L]		Dissolved Manganese [mg/L]	
	2015 Review	AR2014	2015 Review	AR2014	2015 Review	AR2014
Woronora River (WOWQ2)						
Baseline (up to May 2010)						
Baseline mean plus one standard deviation	0.094 ↓	0.097	0.324 ✓	0.324	0.042 ↓	0.043
Baseline mean plus two standard deviations	0.244 ↓	0.252	0.741 ✓	0.741	0.064 ↓	0.065
Extended baseline (up to May 2011)						
Baseline mean plus one standard deviation	0.090 ↓	0.091	0.371 ✓	0.371	0.045 ✓	0.045
Baseline mean plus two standard deviations	0.205 ↓	0.209	0.927 ✓	0.927	0.071 ↓	0.072

Notes: ↑ - recalculated trigger value greater than AR2014 trigger value
↓ - recalculated trigger value less than AR2014 trigger value
✓ - recalculated trigger value the same as AR2014 trigger value

As indicated in Section 2.4.2, the discrepancies for WRWQ9 in the AR2012 and AR2013 reports were noted by Gilbert & Associates and rectified in the preparation of AR2014. The impact of any discrepancies on trigger values is also discussed in Section 2.4.2.

The recalculated trigger values for dissolved aluminium and/or manganese at site WOWQ2 are lower than those reported in AR2014. This has therefore resulted in a more conservative assessment of any exceedances at WRWQ9, ETWQ2 or ETWQ AU.

Review of Figure 33 to Figure 56 indicates that the plots generated for the 2015 Review are consistent with the plots presented in AR2014. It should be noted, however, that the baseline mean + 2 standard deviations (extended period) shown in AR2014 for iron concentration at ETWQAU (Figure 52) is different to that calculated for the 2015 Review. Gilbert & Associates' calculations for the ETWQAU iron baseline (in spreadsheet form) have been reviewed and found to be the same as that calculated for the 2015 Review. It is therefore concluded that there is a graphing error in Figure 52 (from AR2014).

It should be noted that in AR2014, two sets of charts showing dissolved metals in WOWQ2 were provided – Charts 36-38 were provided for comparison with WRWQ9 and Charts 48-50 were provided for comparison with ETWQ2 and ETWQAU. The two sets of charts show the same information, apart from Charts 48-50 providing the following information which is not shown on Charts 36-38:

- The extended baseline mean + 2 standard deviations; and
- Start of Longwall 20 subsidence effects.

The figures selected for presentation (Figure 45 -Figure 50) are those for comparison with site ETWQ2/ ETWQAU.

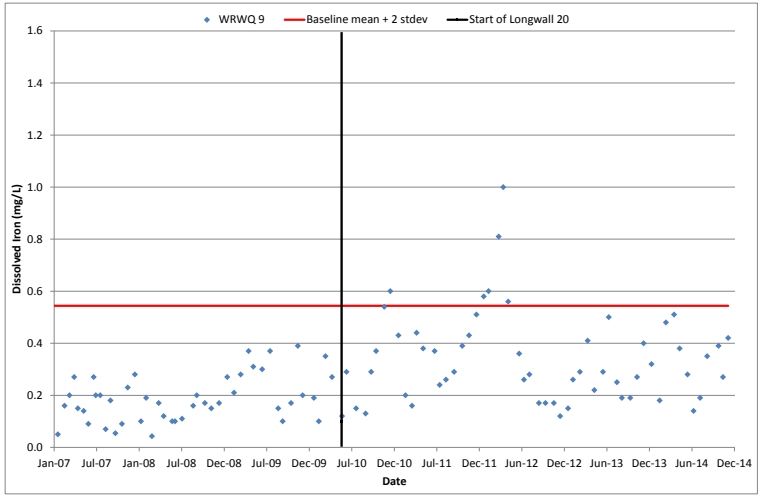


Figure 33: Dissolved Iron Concentrations at WRWQ 9 (2015 review)

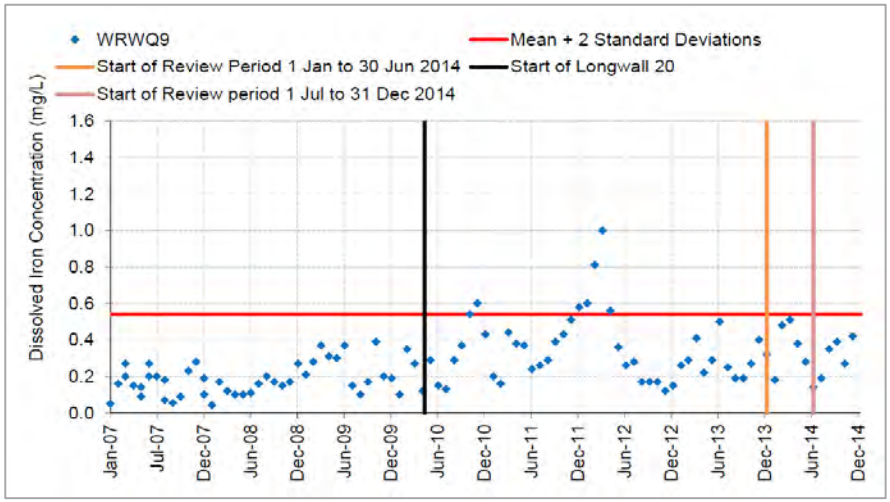


Figure 34: Dissolved Iron Concentrations at WRWQ 9 (AR2014)

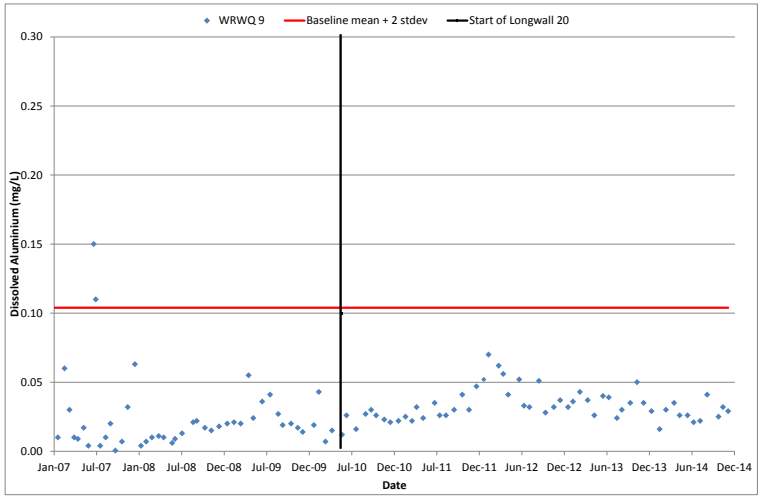


Figure 35: Dissolved Aluminium Concentrations at WRWQ9 (2015 review)

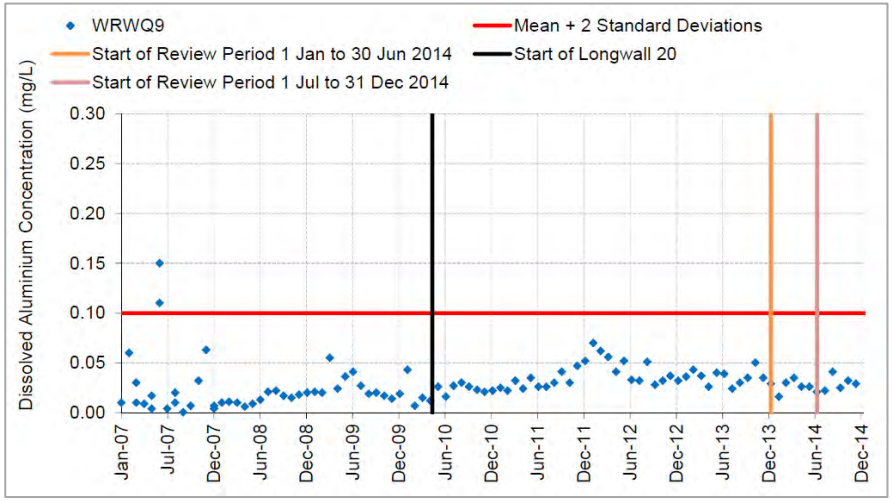


Figure 36: Dissolved Aluminium Concentrations at WRWQ9 (AR2014)

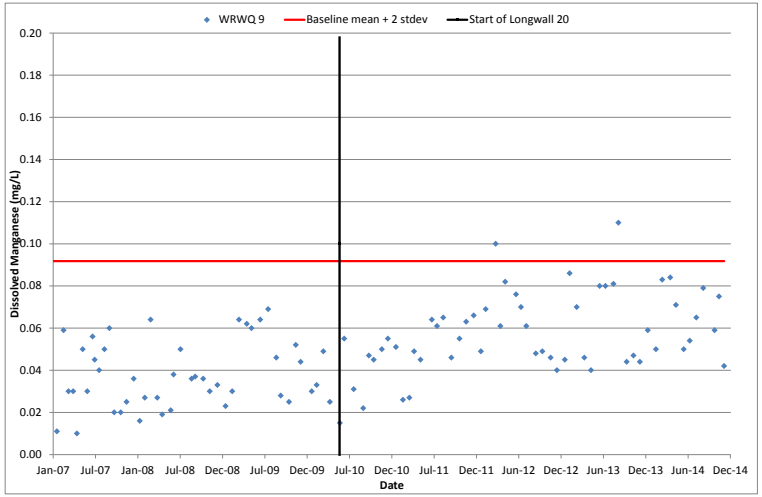


Figure 37: Dissolved Manganese Concentrations at WRWQ9 (2015 review)

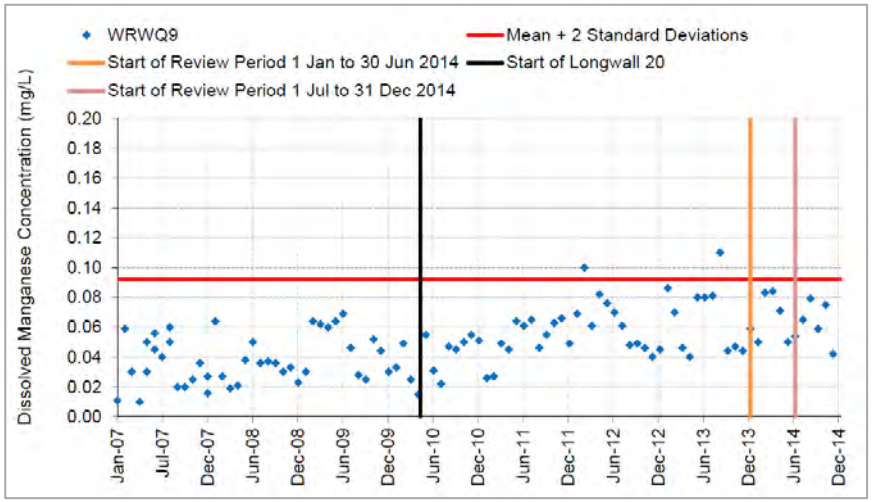


Figure 38: Dissolved Manganese Concentrations at WRWQ 9 (AR2014)

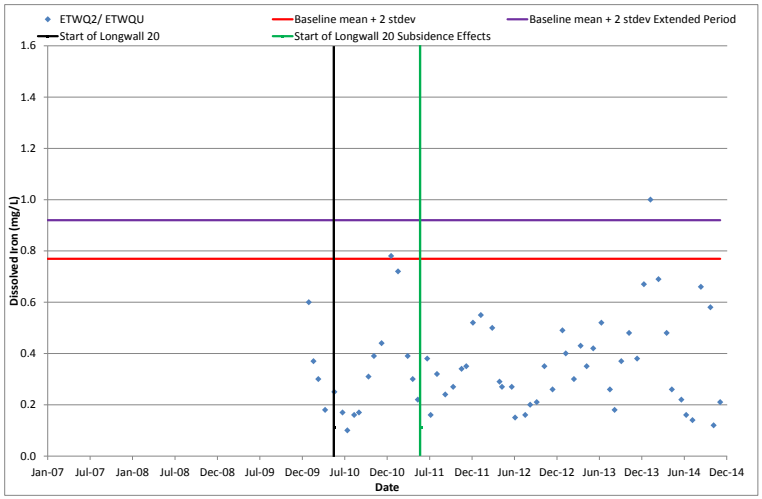


Figure 39: Dissolved Iron Concentrations at ETWQ 2 (2015 review)

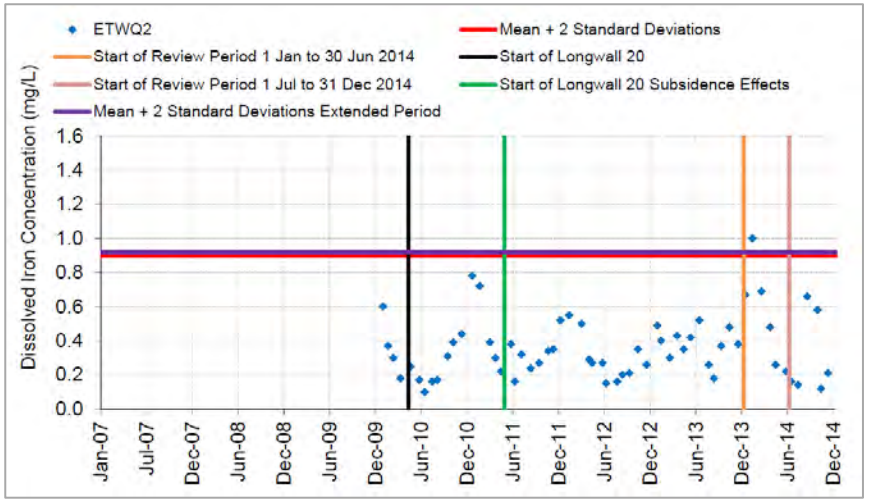


Figure 40: Dissolved Iron Concentrations at ETWQ 2 (AR2014)

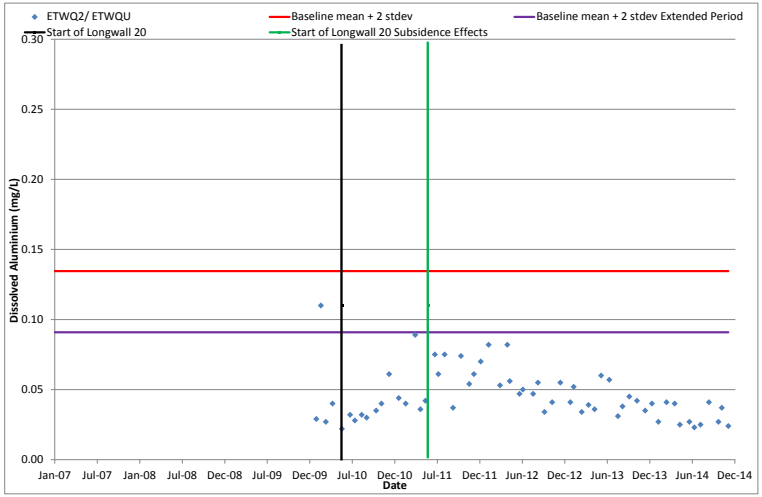


Figure 41: Dissolved Aluminium Concentrations at ETWQ 2 (2015 review)

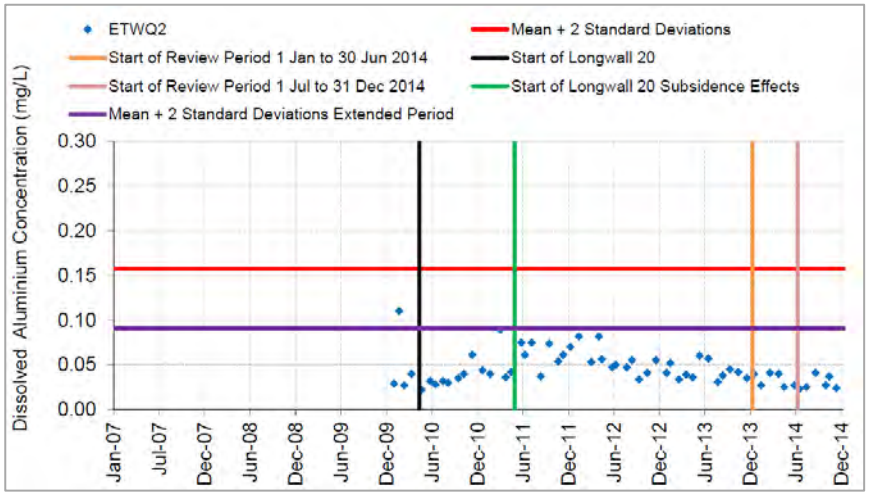


Figure 42: Dissolved Aluminium Concentrations at ETWQ 2 (AR2014)

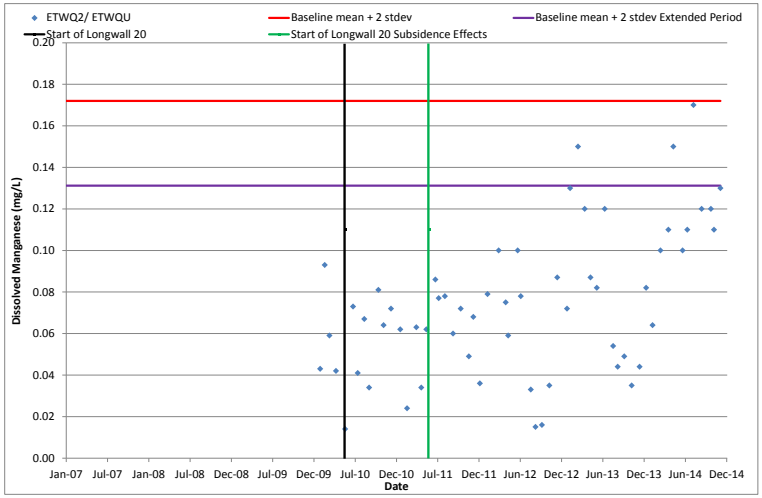


Figure 43: Dissolved Manganese Concentrations at ETWQ 2 (2015 review)

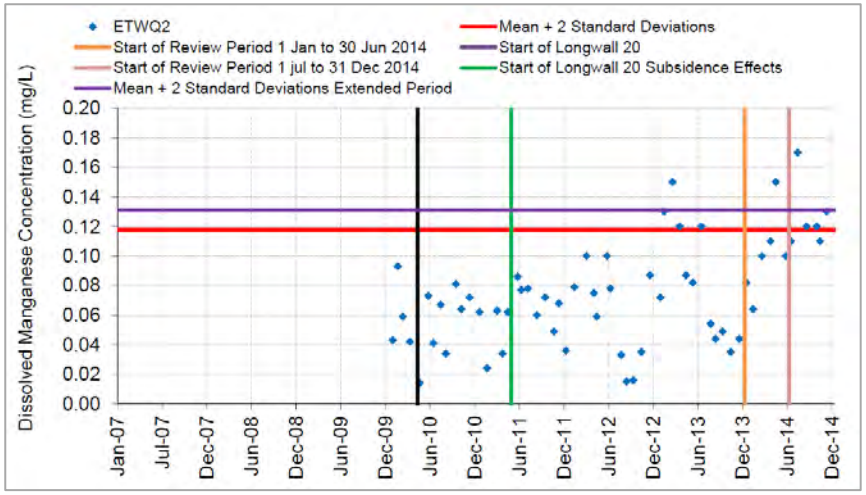


Figure 44: Dissolved Manganese Concentrations at ETWQ 2 (AR2014)

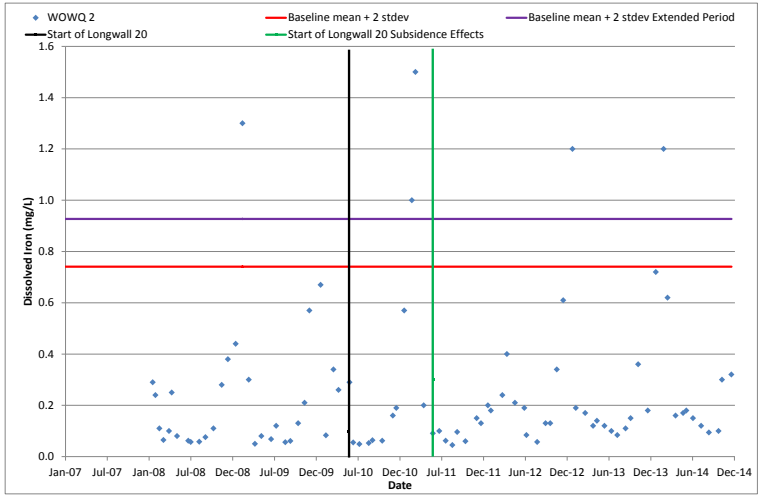


Figure 45: Dissolved Iron Concentrations at WOWQ 2 (2015 review)

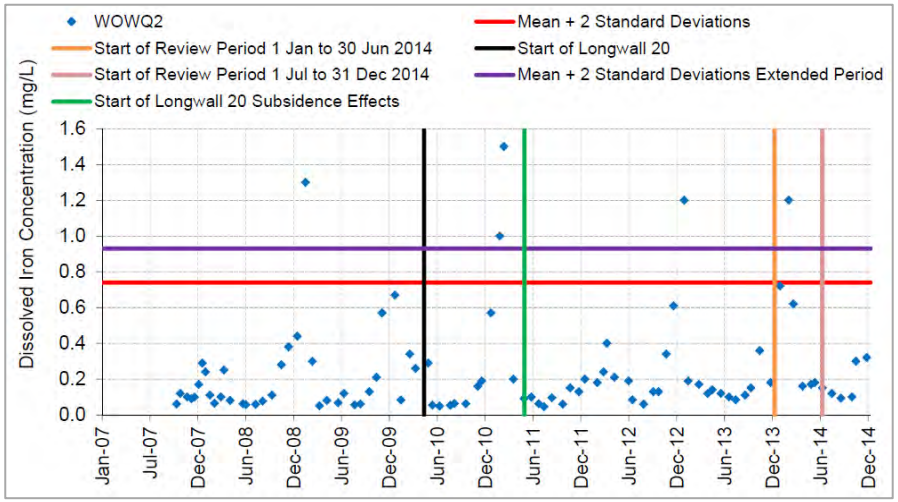


Figure 46: Dissolved Iron Concentrations at WOWQ 2 (AR2014)

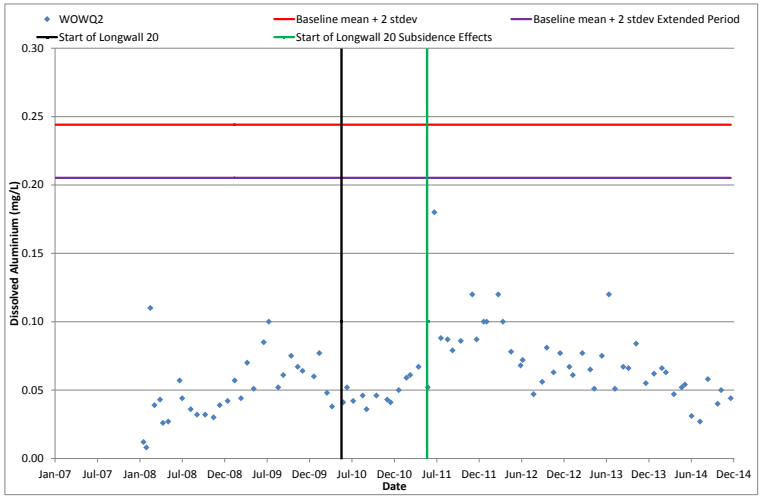


Figure 47: Dissolved Aluminium Concentrations at WOWQ 2 (2015 review)

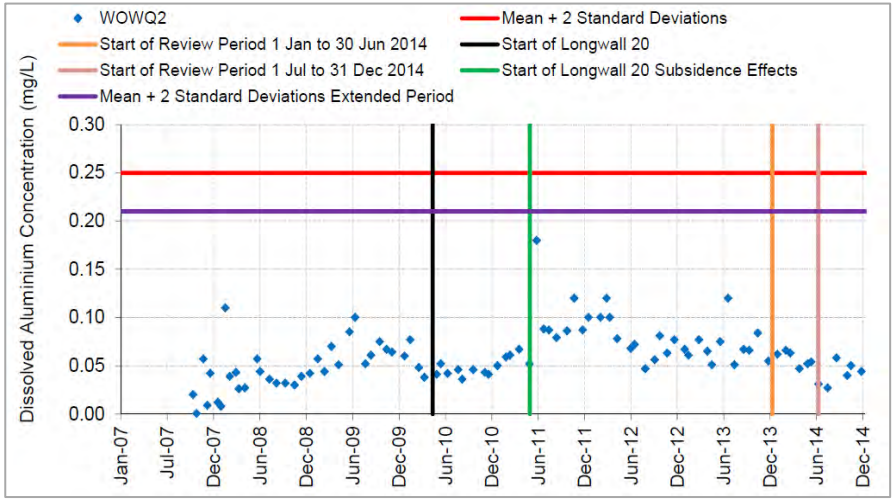


Figure 48: Dissolved Aluminium Concentrations at WOWQ 2 (AR2014)

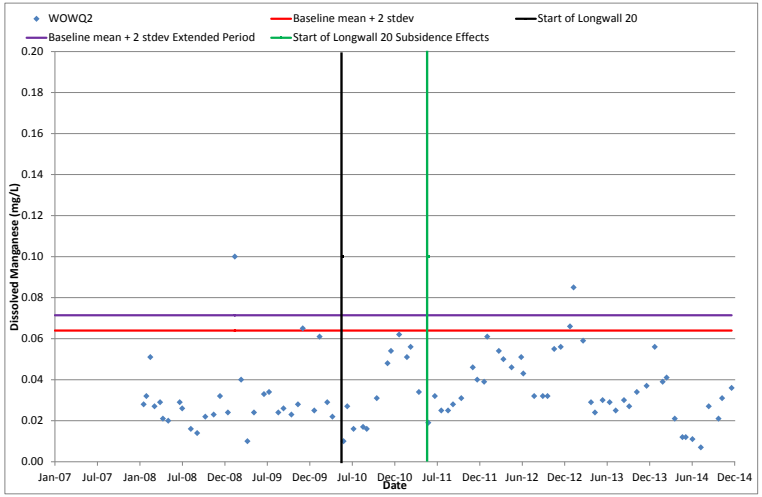


Figure 49: Dissolved Manganese Concentrations at WOWQ 2 (2015 review)

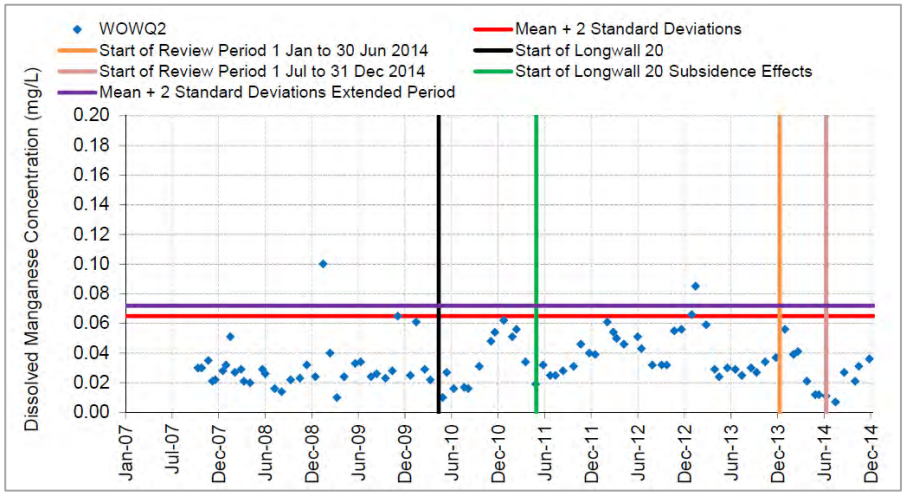


Figure 50: Dissolved Manganese Concentrations at WOWQ 2 (AR2014)

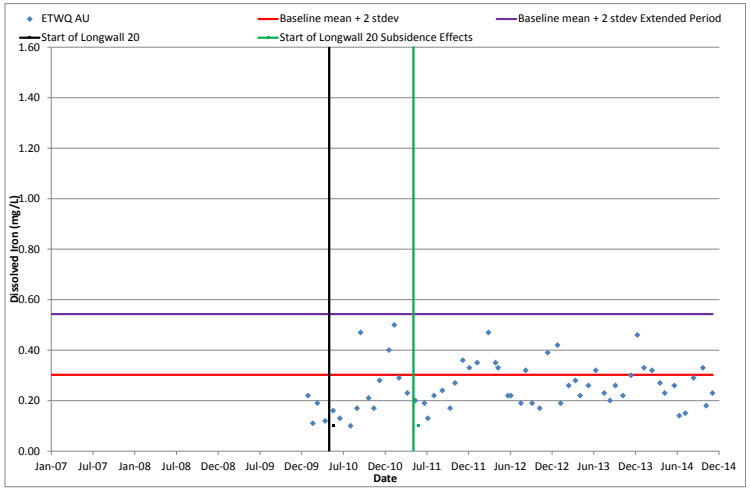


Figure 51: Dissolved Iron Concentrations at ETWQ AU (2015 review)

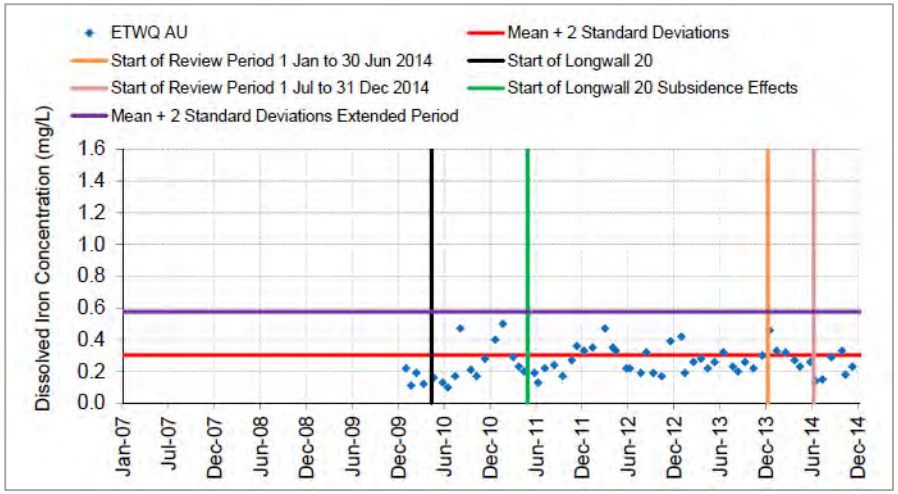


Figure 52: Dissolved Iron Concentrations at ETWQ AU (AR2014)

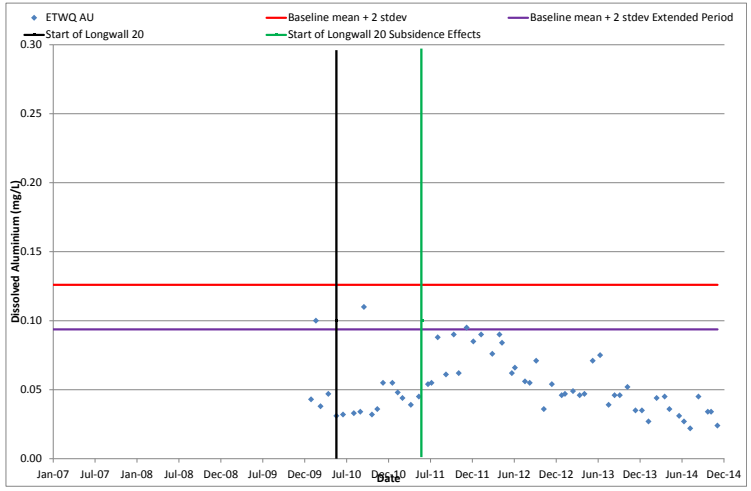


Figure 53: Dissolved Aluminium Concentrations at ETWQ AU (2015 review)

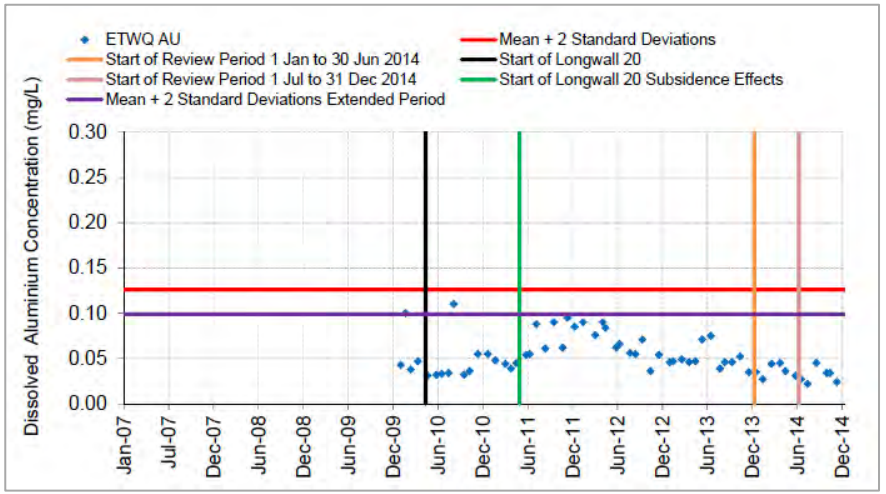


Figure 54: Dissolved Aluminium Concentrations at ETWQ AU (AR2014)

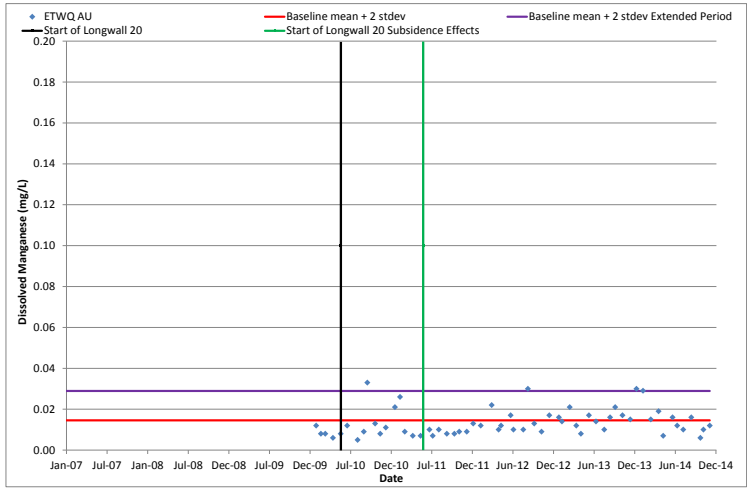


Figure 55: Dissolved Manganese Concentrations at ETWQ AU (2015 review)

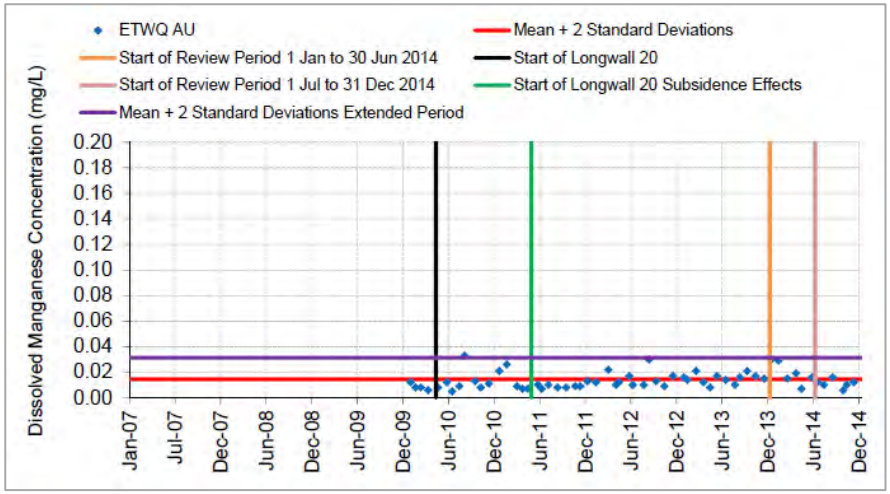


Figure 56: Dissolved Manganese Concentrations at ETWQ AU (AR2014)

2.4.4 Sliding 12 Month Mean of Dissolved Metal Concentrations

2.4.4.1 AR2012

AR2012 reported that:

> *The 12 month sliding means exceeded the mean plus one standard deviation value for dissolved aluminium, dissolved iron and dissolved manganese at site WRWQ9. The 12 month sliding mean did not exceed the mean plus one standard deviation value at site ETWQ2.*
>
> *The 12 month sliding mean for dissolved aluminium at the control sampling site WOWQ2 also marginally exceeded the baseline mean plus one standard deviation value during the review period. There was however no exceedance of the dissolved iron or manganese baseline mean plus one standard deviation value at the WOWQ2 control site.*

Based on the revised calculation of the baseline mean plus one standard deviation, the number of exceedances of dissolved aluminium at WRWQ9 is reduced (only two exceedances). The exceedances of dissolved iron and manganese would be unchanged compared to that reported in AR2012. There would be no impact on the findings reported in AR2012 at ETWQ2 and WOWQ2.

2.4.4.2 AR2013

AR2013 reported that:

> *The sliding 12 month means exceeded the mean plus one standard deviation value for dissolved aluminium, dissolved iron and dissolved manganese at site WRWQ9. The sliding 12 month means did not exceed the mean plus one standard deviation value at site ETWQ2.*
>
> *The sliding 12 month mean for dissolved manganese at the control sampling site WOWQ2 exceeded the baseline mean plus one standard deviation during the reporting period. However the sliding 12 month mean for dissolved iron or dissolved aluminium did not exceed the baseline mean plus one standard deviation value at the control sampling site WOWQ2.*

Based on the revised calculation of the baseline mean plus one standard deviation, the number of exceedances of dissolved aluminium at WRWQ9 is reduced (six exceedances). The exceedances of dissolved iron and manganese would be unchanged compared to that reported in AR2013. There would be no impact on the findings reported in AR2013 for ETWQ2 and WOWQ2.

2.4.4.3 Plots

Charts of sliding 12 month means of dissolved metal concentrations (aluminium, iron and manganese) compared to the baseline mean plus one standard deviation for sites WRWQ9, ETWQ2/ETWQU and WOWQ2 are presented in AR2012, AR2013 and AR2014. Additionally, charts of sliding 12 month means of dissolved metal concentrations compared to baseline data for site ETWQAU are presented in AR2014.

Plots for these dissolved metals have been generated as part of the 2015 review for the water quality monitoring sites identified. The plots generated for the 2015 review, together with the corresponding plots from AR2014, are presented in Figure 57 to Figure 80.

It should be noted that in AR2014, two sets of charts showing the sliding 12 month mean of dissolved metals in WOWQ2 were provided – Charts 42-44 were provided for comparison with WRWQ9 and Charts 54-56 were provided for comparison with ETWQ2 and ETWQAU. The two sets of charts show the same information, apart from Charts 54-56 providing the following information which is not shown on Charts 42-44:

- The extended baseline mean + 2 standard deviations; and
- Start of Longwall 20 subsidence effects.

The figures selected for presentation (Figure 69 - Figure 74) are those for comparison with site ETWQ2/ ETWQAU.

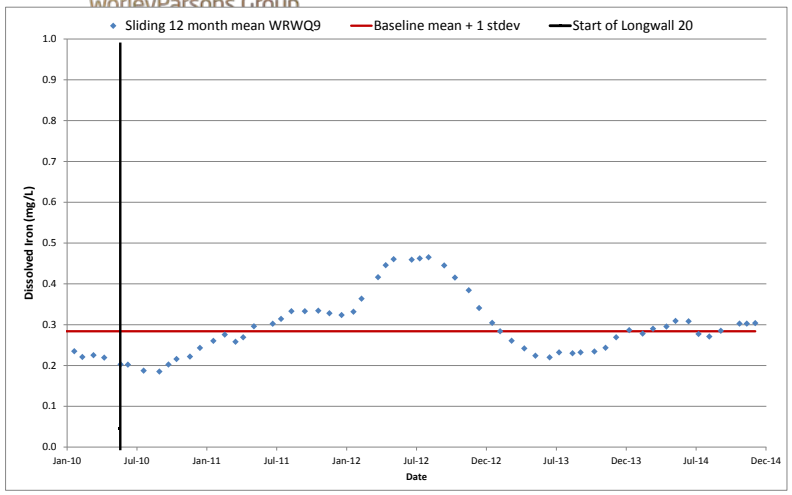


Figure 57: Sliding 12 Month Mean of Dissolved Iron Concentrations at WRWQ 9 (2015 review)

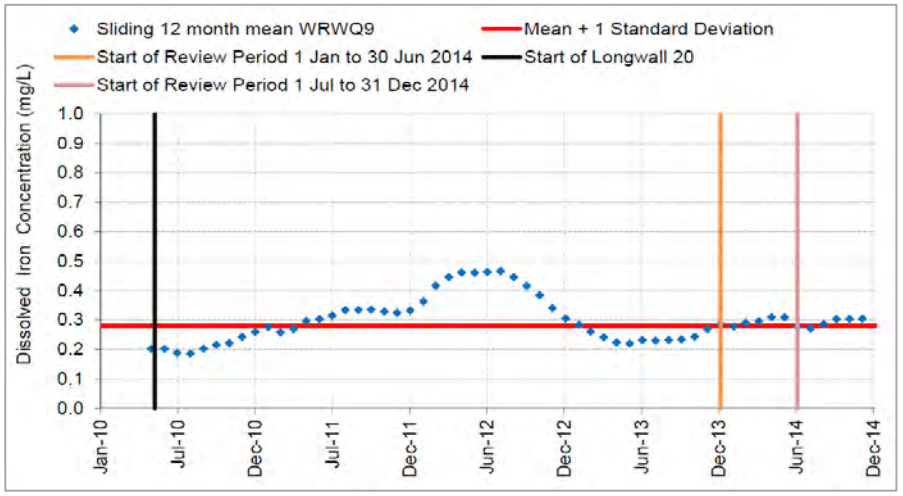


Figure 58: Sliding 12 Month Mean of Dissolved Iron Concentrations at WRWQ 9 (AR2014)

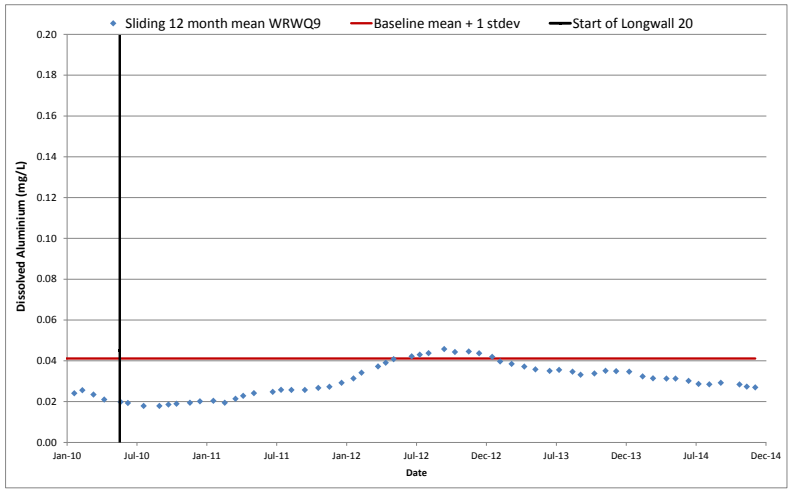


Figure 59: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at WRWQ 9 (2015 review)

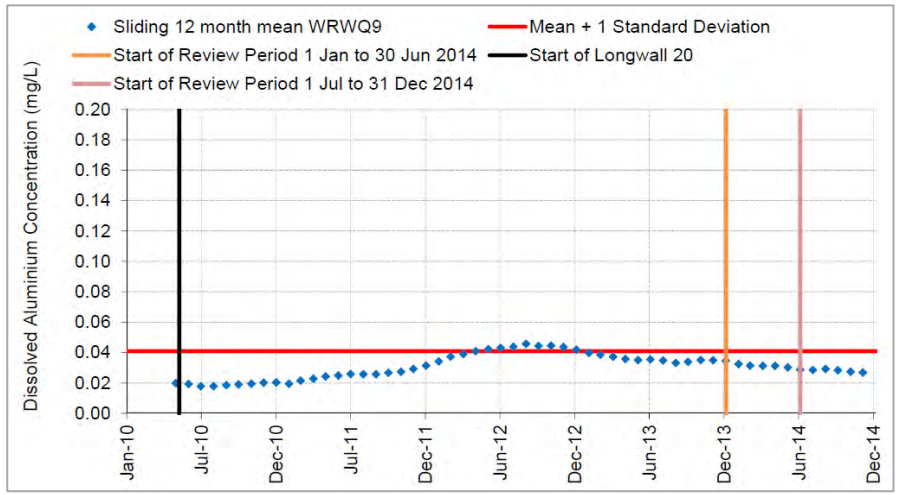


Figure 60: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at WRWQ 9 (AR2014)

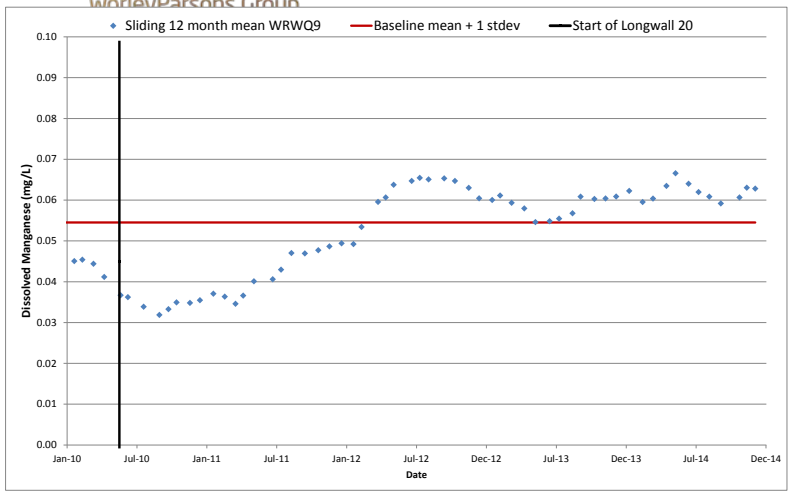


Figure 61: Sliding 12 Month Mean of Dissolved Manganese Concentrations at WRWQ 9 (2015 review)

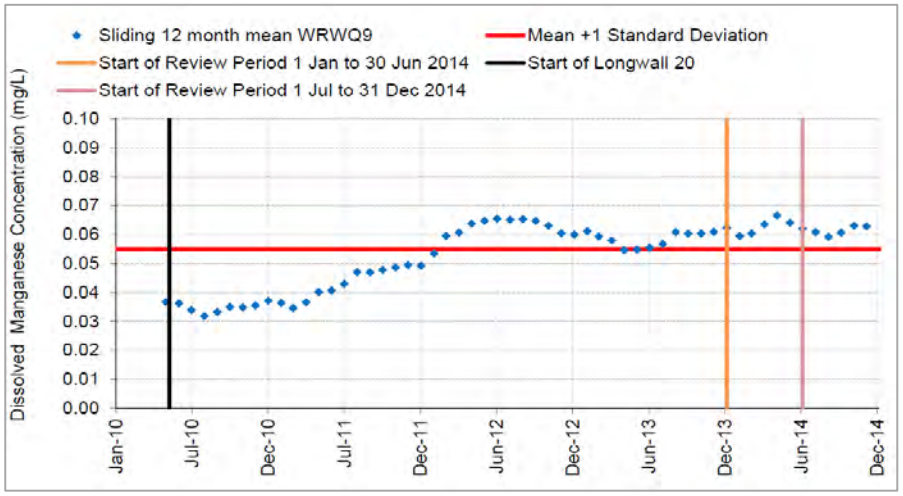


Figure 62: Sliding 12 Month Mean of Dissolved Manganese Concentrations at WRWQ 9 (AR2014)

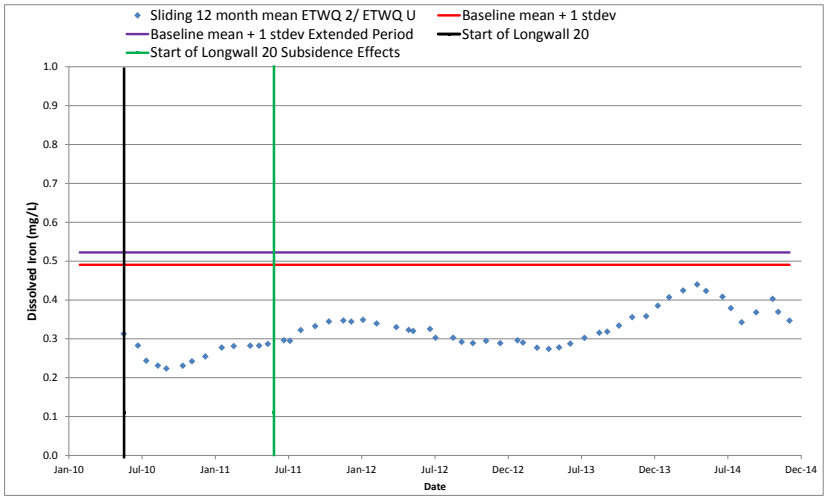


Figure 63: Sliding 12 Month Mean of Dissolved Iron Concentrations at ETWQ 2 (2015 review)

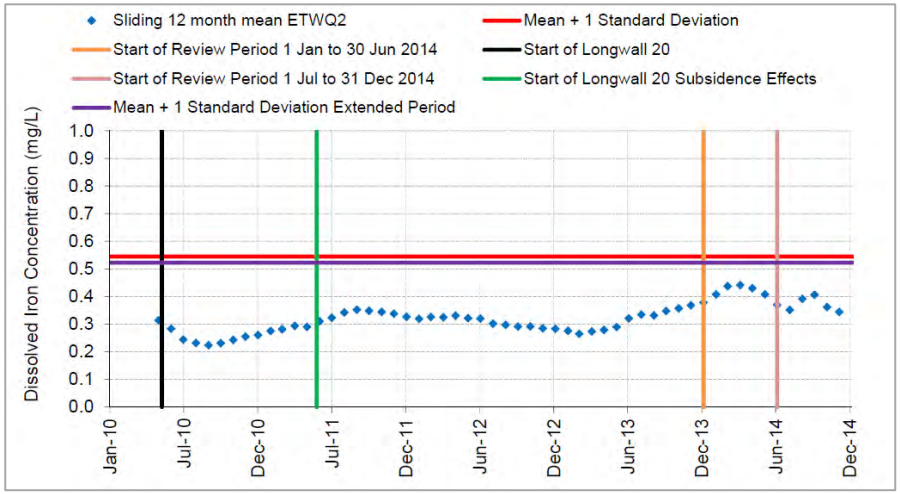


Figure 64: Sliding 12 Month Mean of Dissolved Iron Concentrations at ETWQ 2 (AR2014)

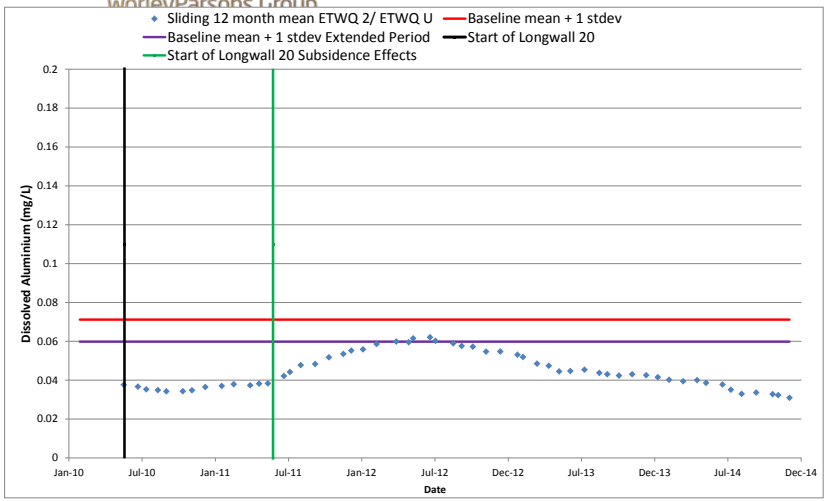


Figure 65: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at ETWQ 2 (2015 review)

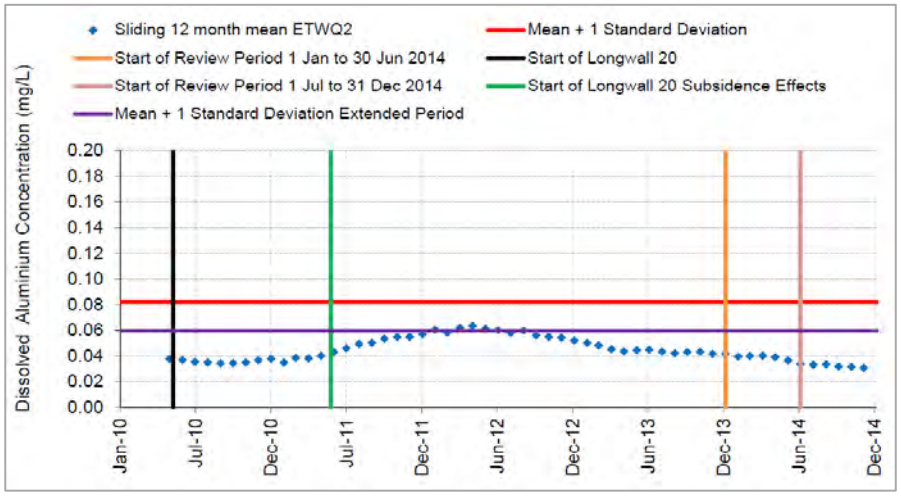


Figure 66: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at ETWQ 2 (AR2014)

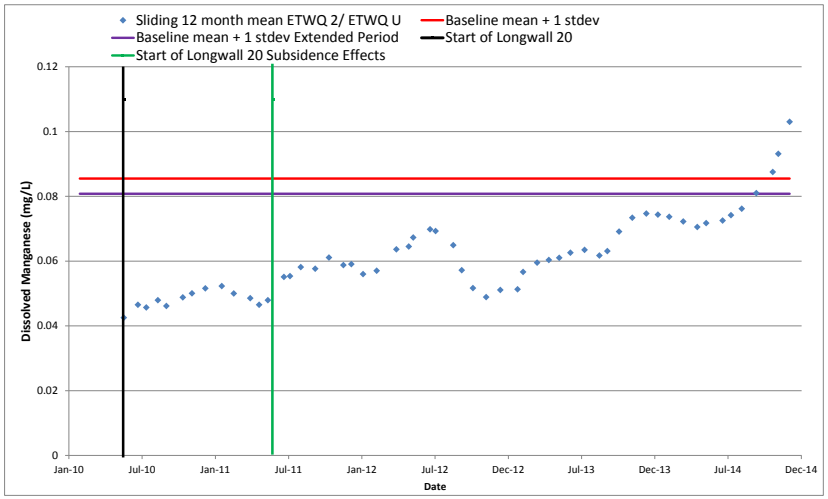


Figure 67: Sliding 12 Month Mean of Dissolved Manganese Concentrations at ETWQ 2 (2015 review)

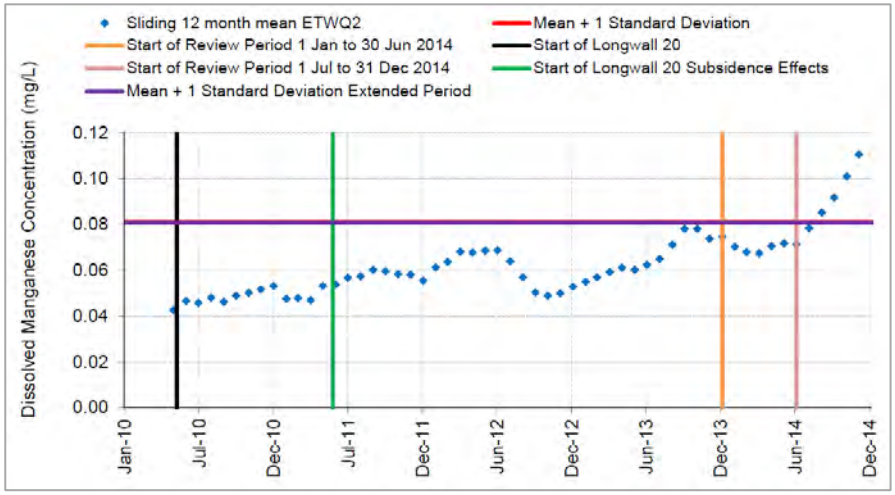


Figure 68: Sliding 12 Month Mean of Dissolved Manganese Concentrations at ETWQ 2 (AR2014)

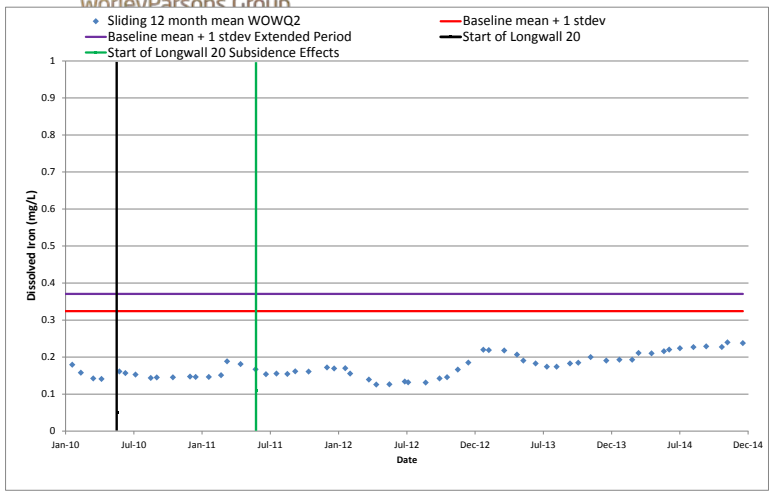


Figure 69: Sliding 12 Month Mean of Dissolved Iron Concentrations at WOWQ 2 (2015 review)

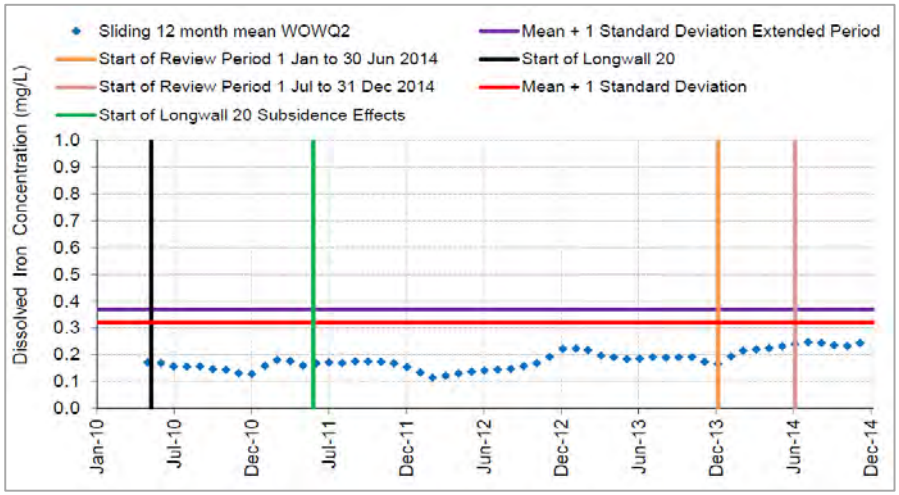


Figure 70: Sliding 12 Month Mean of Dissolved Iron Concentrations at WOWQ 2 (AR2014)

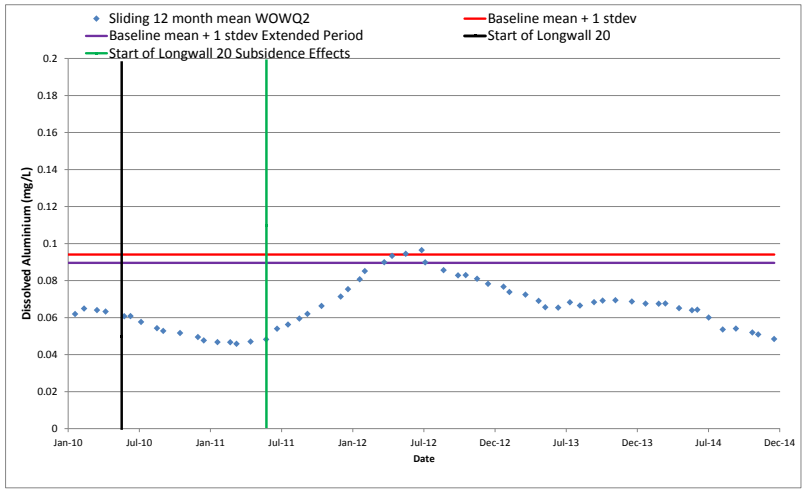


Figure 71: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at WOWQ 2 (2015 review)

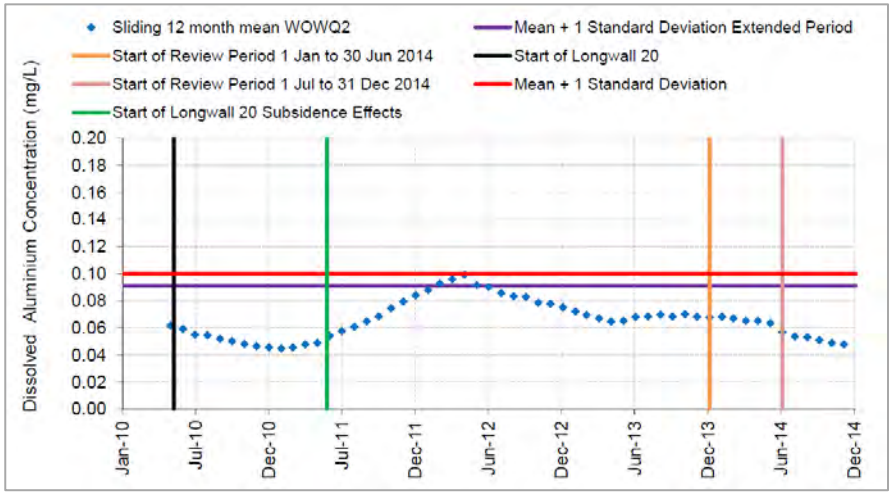


Figure 72: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at WOWQ 2 (AR2014)

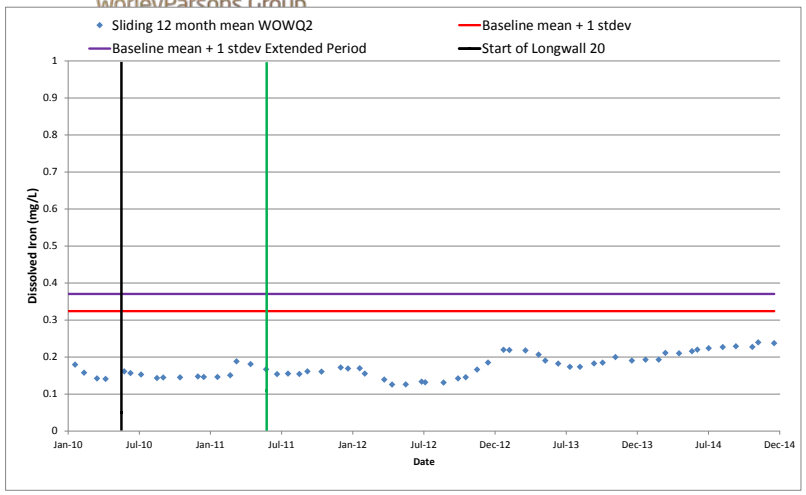


Figure 73: Sliding 12 Month Mean of Dissolved Manganese Concentrations at WOWQ 2 (2015 review)

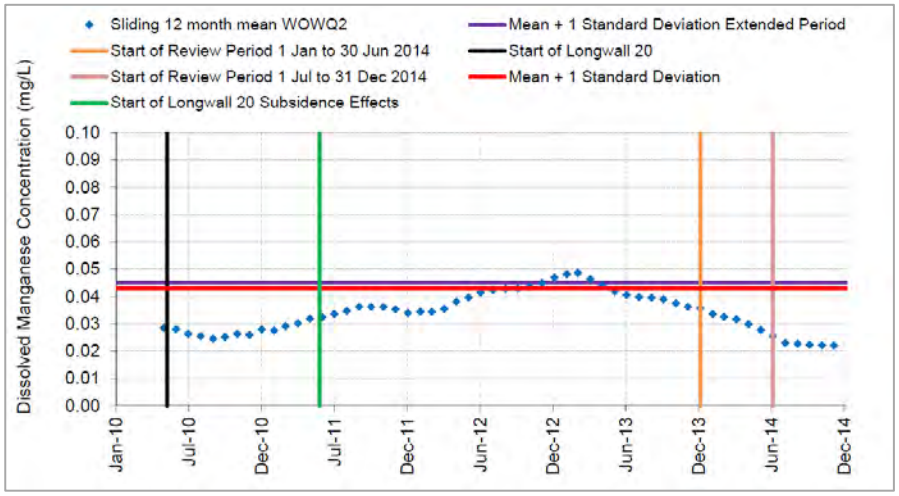


Figure 74: Sliding 12 Month Mean of Dissolved Manganese Concentrations at WOWQ 2 (AR2014)

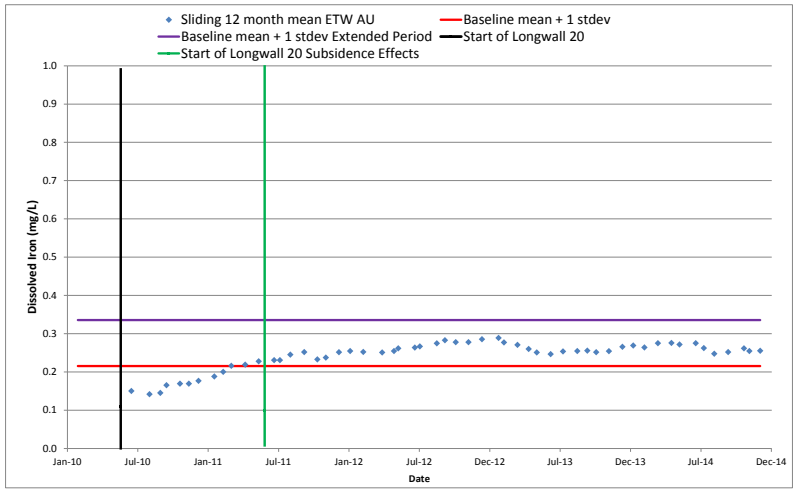


Figure 75: Sliding 12 Month Mean of Dissolved Iron Concentrations at ETWQ AU (2015 review)

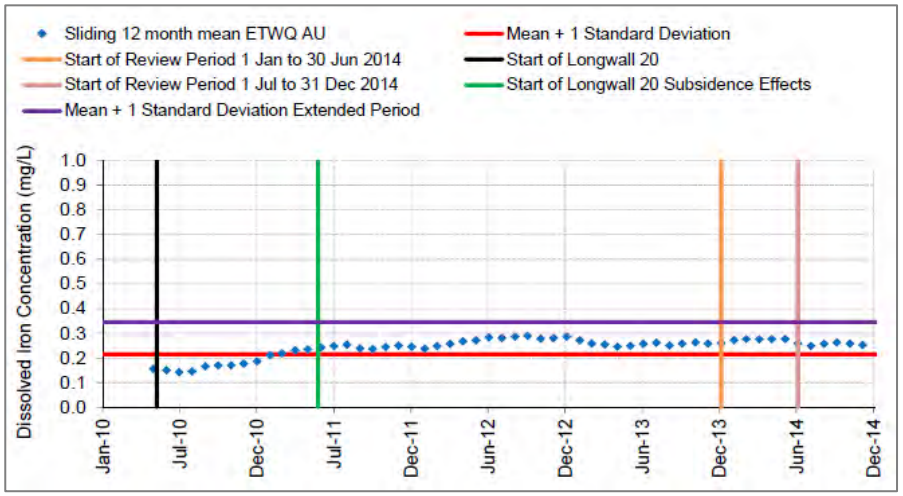


Figure 76: Sliding 12 Month Mean of Dissolved Iron Concentrations at ETWQ AU (AR2014)

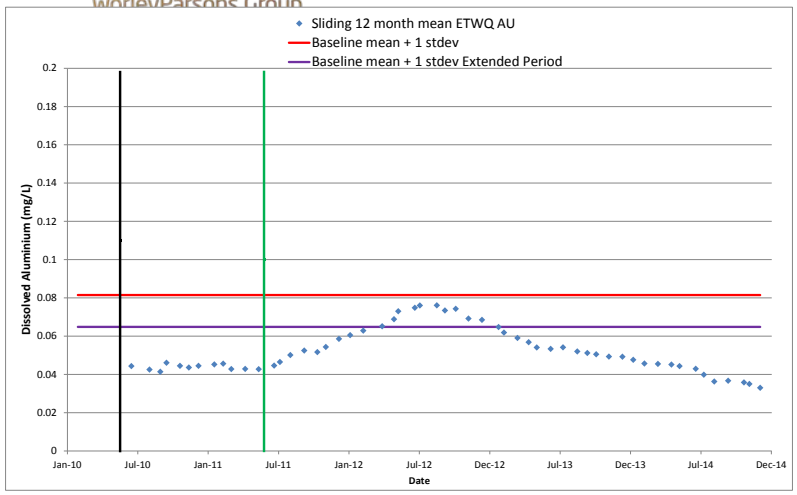


Figure 77: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at ETWQ AU (2015 review)

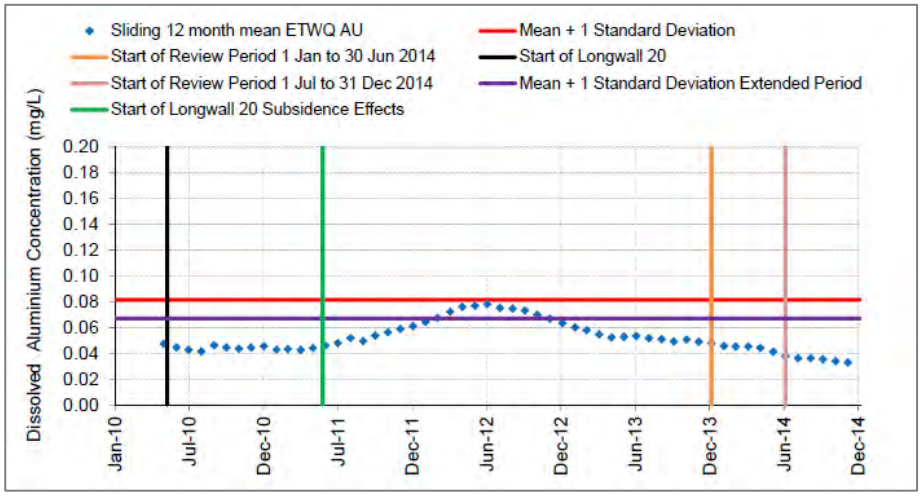


Figure 78: Sliding 12 Month Mean of Dissolved Aluminium Concentrations at ETWQ AU (AR2014)

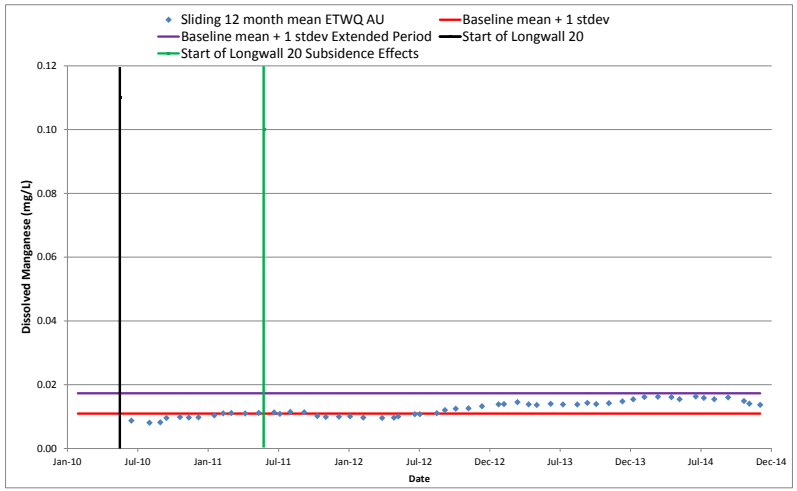


Figure 79: Sliding 12 Month Mean of Dissolved Manganese Concentrations at ETWQ AU (2015 review)

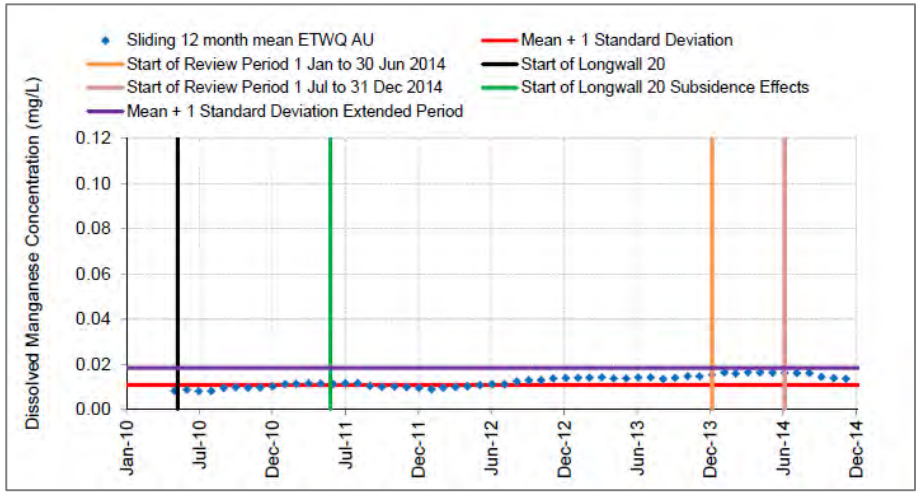


Figure 80: Sliding 12 Month Mean of Dissolved Manganese Concentrations at ETWQ AU (AR2014)

2.5 Surface Facilities

Plots of key water quality parameters (pH, total suspended solids and oil and grease) monitored at EPL 767 monitoring point 9 are presented in the AR2012 and AR2013. AR2014 provides tabulated monthly data for the monitored parameters.

Plots for these key water quality parameters have been generated as part of the 2015 Review and are presented in Figure 81 to Figure 92 together with the corresponding plots from AR2012 and AR2013.

These plots are generally consistent with those presented in the Annual Reviews. It should be noted that pH results prior to May 2013 are laboratory pH. In May 2013 Metropolitan Mine adopted use of the field pH reading rather than the laboratory pH, based on recommendations from their specialist sampling consultants.

Additionally, Figure 81 (pH results, 2015 review) shows an exceedance of the pH limit on the 29 March 2015. However, the tank was not discharging on this day. In these circumstances, a sample is taken so that the EPL commitment to monthly sampling is maintained, however the result is not shown in the Annual Review. Metropolitan Mine reports these values in their Annual Returns to the EPA while noting if the sample is not representative of an actual discharge event.

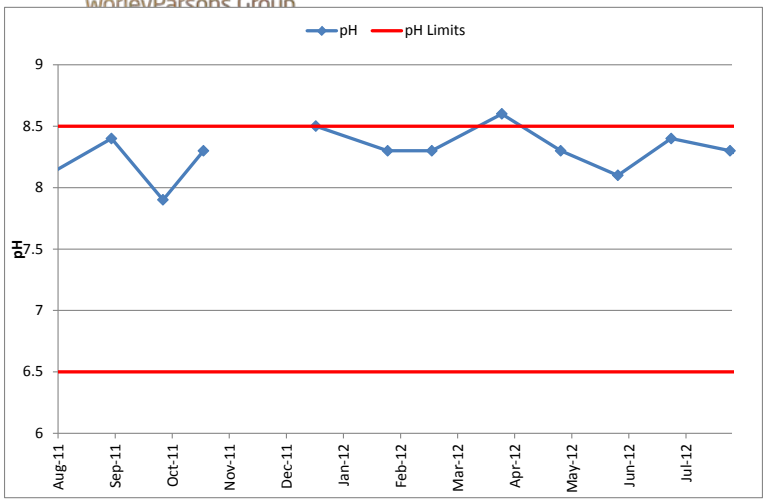


Figure 81: pH at Monitoring Point 9 (2015 review, AR2012 period)

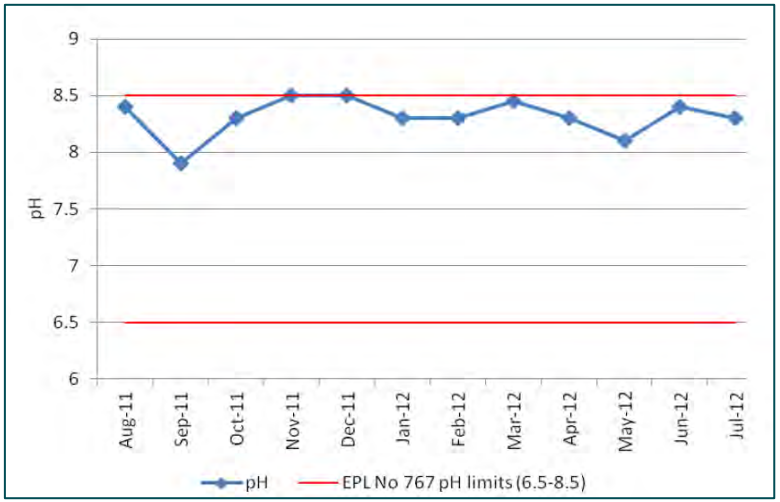


Figure 82: pH at Monitoring Point 9 (AR2012)

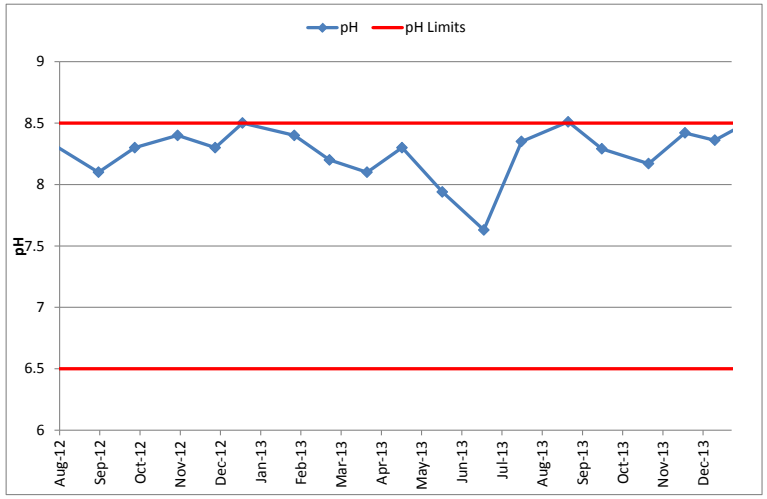


Figure 83: pH at Monitoring Point 9 (2015 review, AR2013 period)

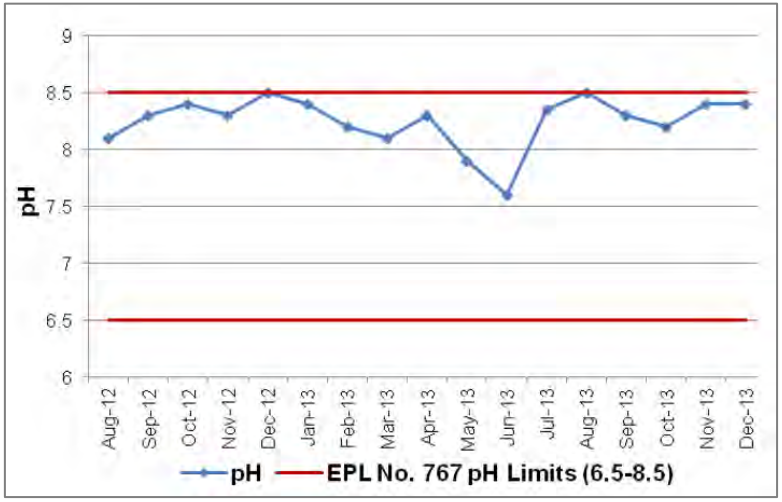


Figure 84: pH at Monitoring Point 9 (AR2013)

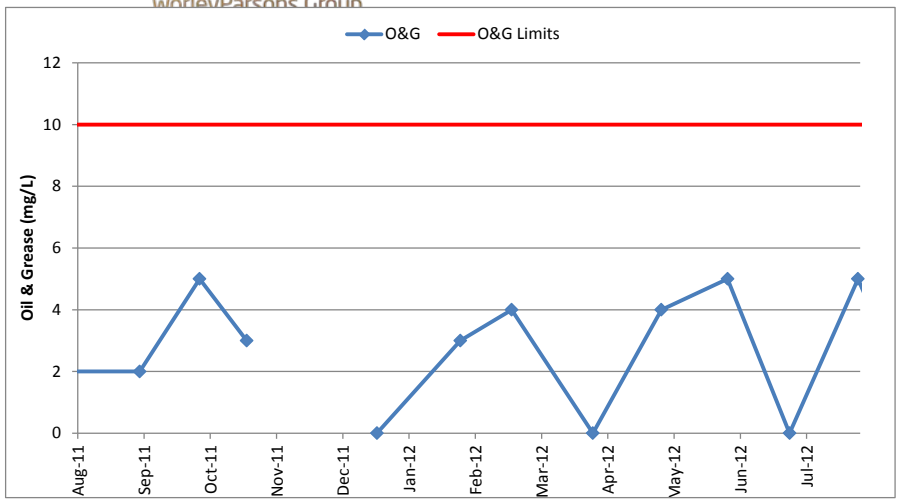


Figure 85: Oil and Grease at Monitoring Point 9 (2015 review, AR2012 period)

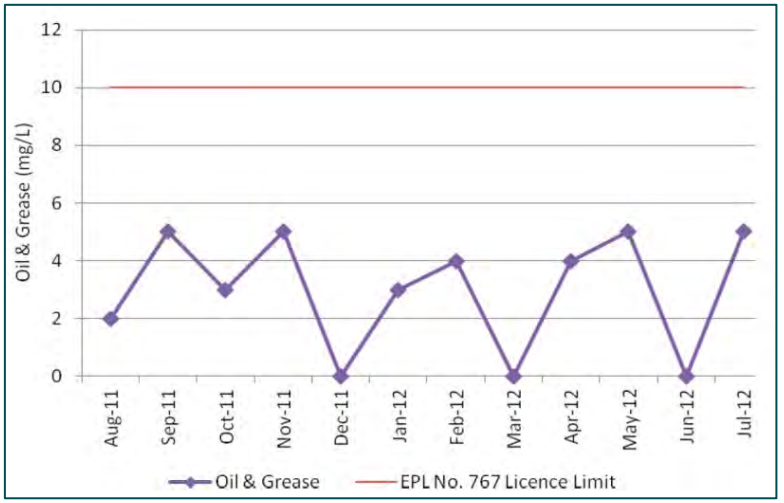


Figure 86: Oil and Grease at Monitoring Point 9 (AR2012)

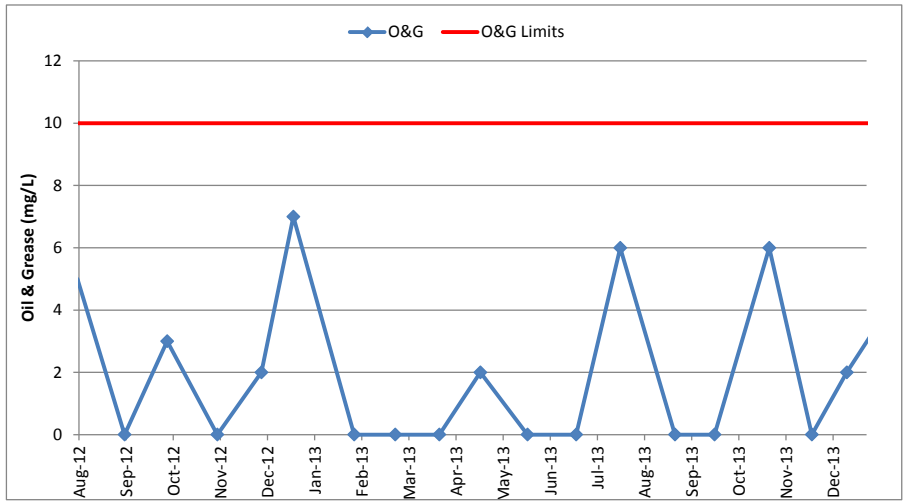


Figure 87: Oil and Grease at Monitoring Point 9 (2015 review, AR2013 period)

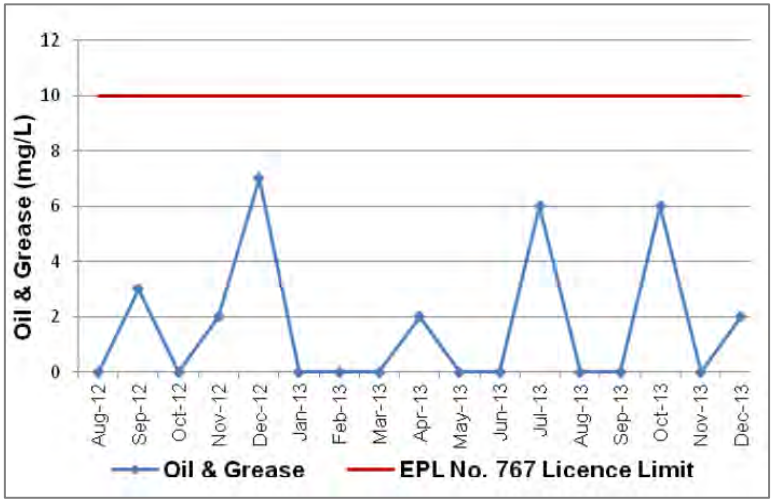


Figure 88: Oil and Grease at Monitoring Point 9 (AR2013)

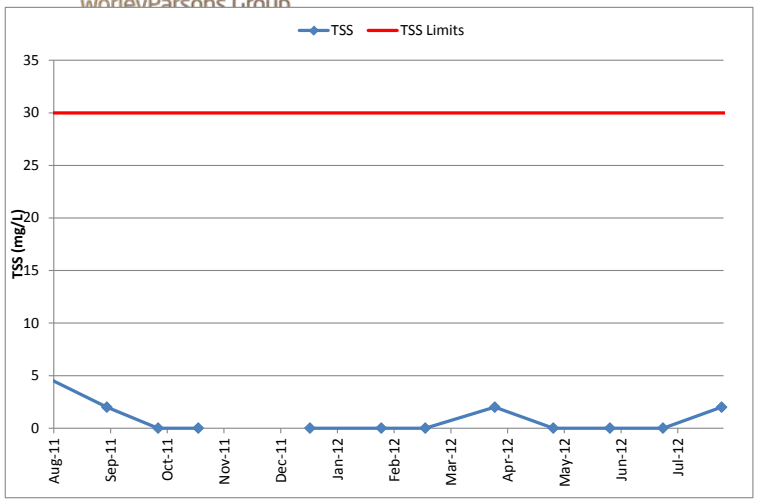


Figure 89: Total Suspended Solids at Monitoring Point 9 (2015 review, AR2012 period)

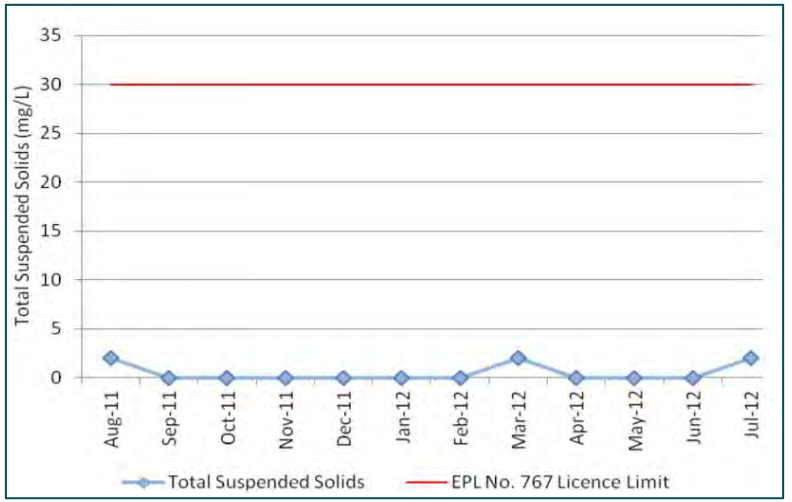


Figure 90: Total Suspended Solids at Monitoring Point 9 (AR2012)

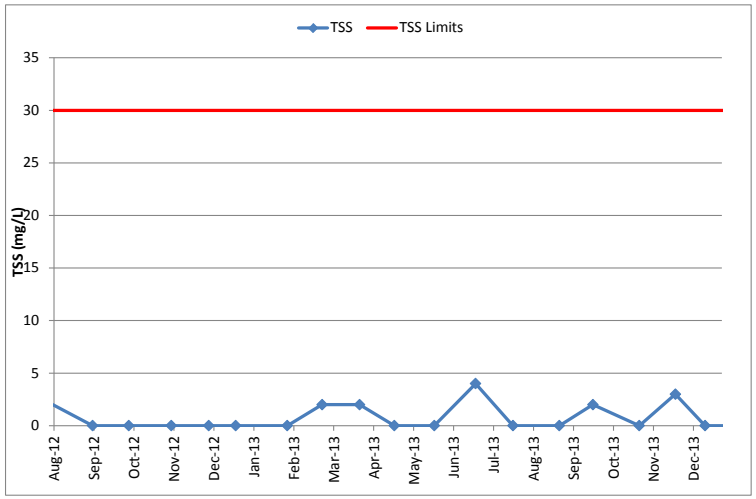


Figure 91: Total Suspended Solids at Monitoring Point 9 (2015 review, AR2013 period)

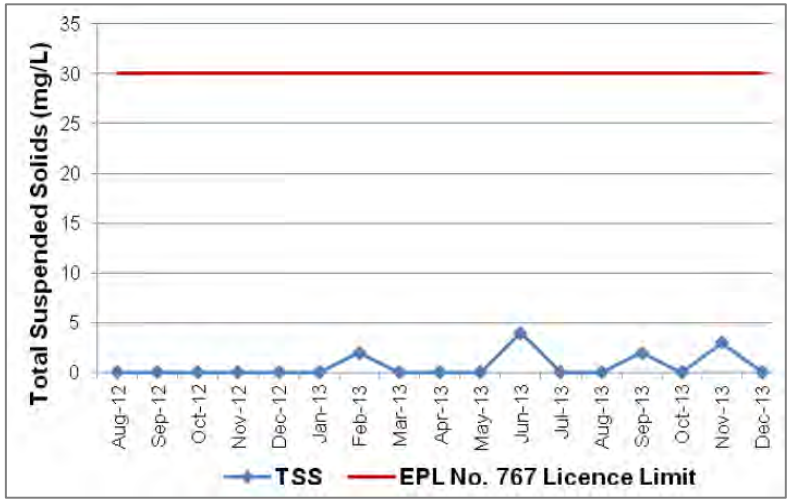


Figure 92: Total Suspended Solids at Monitoring Point 9 (AR2013)

Table 7 contains a summary of monitoring results at monitoring point 9 for 2014 based on the data provided for this 2015 Review and the data provided in Table 59 of AR2014.

A number of minor inconsistencies in Table 59 in AR2014 have been noted (shown in red font). Metropolitan Mine has advised that these discrepancies are typographical and do not alter compliance with EPL requirements.

As shown in Table 6, AR2014 has recorded "no discharge" against the months January, April, May and July while the data provided for the 2015 review shows numerical results. It has been confirmed by Metropolitan Mine that "no discharge" indicates that the water treatment plant was not discharging at the time of sampling.

Table 7: Comparison of 2014 Monitoring Results at Monitoring Point 9

	pH		Oil and Grease		TSS		Source of Discrepancy
	AR2014	2015 Review	AR2014	2015 Review	AR2014	2015 Review	
January	No discharge	8.59	No discharge	5.00	No discharge	<2	
February	8.4	8.4	<2	<2	<2	<2	
March	8.3	8.0	6	6	<2	<2	Laboratory pH result recorded instead of field pH
April	No discharge	8.64	No discharge	5.00	No discharge	2.00	
May	No discharge	8.41	No discharge	<2	No discharge	<2	
June	8.4	8.5	6	6	15	15	Laboratory pH result recorded instead of field pH
July	No discharge	8.64	No discharge	3.00	No discharge	<2	
August	8.1	8.1	<2	<2	2	2	
September	8.3	8.3	4	4	4	2	The O&G results were reported for both O&G and TSS
October	8.5	8.5	2	2	<2	<2	
November	8.4	8.4	4	4	<2	<2	
December	7.8	7.9	7	7	12	12	Rounding error

3 Conclusion

This Annexure to the 2015 Independent Environmental Audit provides the review of Metropolitan Mine's publically available surface water quality data carried out as part of the audit process.

This review has found that, for the analytes of concern at key monitoring sites:

- the raw data and laboratory reports have been accurately transcribed into spreadsheet form;
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 accurately reflects the raw data; and
- the water quality data presented in the plots and tables in AR2012, AR2013 and AR2014 has been appropriately interpreted.

It is noted that there were some discrepancies in the calculation of the baseline mean plus one standard deviation and the baseline mean plus two standard deviations. These discrepancies resulted in the over reporting of some exceedances of water quality data but did not result in any exceedances not being reported.

Attachment A

Project Approval 08_0149 22 June 2008

MOD 1 – 8 September 2010
MOD 2 – 2 July 2011
MOD 3 – 3 October 2013

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	SCHEDULE 2 ADMINISTRATIVE CONDITONS			
	OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT			
2/1	The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.			**Noted**
	TERMS OF APPROVAL			
2/2	The Proponent shall carry out the project generally in accordance with the: (a) EA; (b) PPR; (c) EA-MOD1 Environmental Assessment titled Metropolitan Mine Replacement Drift Construction Modification Environmental Assessment, dated July 2010; and (d) conditions of this approval. *Note: General layout of the project is shown in Appendices 2 to 4.*	• Metropolitan Coal Project Environmental Assessment, Sep 2008 • Metropolitan Coal Project Preferred Project Report, dated May 2009 • Environmental Assessment - Metropolitan Mine Replacement Drift Construction Modification 1 Jul 2010	The Metropolitan Mine has been developed generally in accordance with the Environmental Assessment, Preferred Project Report and Modifications.	**Compliant Ongoing**
2/3	If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.		No inconsistency with the Metropolitan Colliery development and the Environmental Assessment and Modifications have been identified.	**Compliant Ongoing**
2/4	The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of: (a) any strategies, plans, programs, reviews, audits, or correspondence that are submitted in accordance with this approval; and (b) the implementation of any actions or measures contained in these documents.			**Noted**
	LIMITS ON APPROVAL			
2/5	The Proponent may undertake mining operations in the mining area for up to 23 years from the date of this approval.	Project Approval 22 June 2009	The mining operations under this Project Approval can occur until 2033.	**Noted**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
2/6	The Proponent shall not: (a) extract more than 3.2 million tonnes of ROM coal from the mining area in a calendar year, or (b) transport more than 2.8 million tonnes of product coal from the site in a calendar year.		(a) The ROM coal production from the Metropolitan Coal operations has not exceeded 3.2 Mtpa in the calendar years 2012 to 2014. (b) Product coal transported from the site has not exceeded 2.8 Mtpa in the calendar years 2012 to 2014.	**Compliant Ongoing**
2/7	The Proponent shall not export any coal reject from the site after 2021 without the written approval of the D-G.			**Noted**
2/8	The Proponent shall not emplace coal reject on the surface of the site without the written approval of the D-G. *Note: This condition applies to the Camp Gully Emplacement Area, as well as to the rest of the surface of the site. It does not apply to the proposed additional coal reject stockpile shown in Appendix 4.*		No coal reject emplacement occurs on the surface at the Metropolitan Mine site.	**Compliant Ongoing**
	STRUCTURAL ADEQUACY			
2/9	The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structure, are constructed in accordance with: (a) the relevant requirements of the BCA; and (b) any additional requirements of the MSB in areas where subsidence effects are likely to occur. *Notes:* • *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.* • *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*	• Letter from DoP re Surface Facilities Works at Mine Mangers Residence, 21 Apr 2010	Renovations were completed in 2011 to the former Mine Manager's residence for Metropolitan Coal administration offices. All works were conducted in accordance with BCA requirements and fully landscaped cognisant of the residential surrounds. Building construction between 2011 and 2014 has occurred in accordance with the BCA requirements: **Building** activities during 2011 were: • commencement of the new Large Coal Plant, extension of the existing CHPP • installation of a pilot backfill plant, • establishment of a portal and commencement of tunnelling for the new mine access Building construction activities during 2012 included: • construction of an electrical substation, associated cabling and switch room; • • construction of the replacement drift; • • extension to the bathhouse; • • renovations to the store and workshop building; • • installation of the Coal Preparation Plant motor control centre; and • completion of construction of the Large Coal Plant building (extension of the existing Coal Handling and Preparation Plant). No other new buildings or structures have been constructed between 2011 and 2015.	**Compliant**

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>DEMOLITION</td><td></td><td></td><td></td></tr>
<tr><td>2/10</td><td>The Proponent shall ensure that all demolition work is carried out in accordance with Australian Standard AS 2601-2001: The Demolition of Structures, or its latest version.</td><td>• Demolition Safety Plan Metropolitan Colliery Partial Demolition of the Maintenance and Bag House Sheds, 30 Aug 2010
• Inspection and Test Record Partial Demolition of Sheds, World Wide Demolitions Pty Ltd, 30 Aug 2010</td><td>All demolition work carried out on the Metropolitan Colliery site has occurred in accordance with AS 2601-2001: The Demolition of Structures, with demolition applications being approved by NSW Work Cover.
Demolition undertaken during 2011 included partial removal of the existing surface workshop, removal of a yard storage shed, and removal of a 700t coal storage bin.
Demolition undertaken during 2012 included removal of two explosives magazines.
No further demolition was undertaken during 2013-2015.</td><td>Compliant</td></tr>
<tr><td></td><td>OPERATION OF PLANT AND EQUIPMENT</td><td></td><td></td><td></td></tr>
<tr><td>2/11</td><td>The Proponent shall ensure that all plant and equipment used at the site is:
(a) maintained in a proper and efficient condition; and
(b) operated in a proper and efficient manner.</td><td>• Standards of Mechanical Engineering, Engineering Standard Practice – Metropolitan Colliery, 2010-2011
• Mechanical Engineering M-CM-MP-049</td><td>All plant and equipment is maintained in accordance with the Metropolitan Colliery Mechanical Engineering M-CM-MP-049 Management System.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>STAGED SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS</td><td></td><td></td><td></td></tr>
<tr><td>2/12</td><td>With the approval of the Director-General, the Proponent may submit any strategies, plans or programs required by this approval on a progressive basis.</td><td></td><td>All strategies, plans and programs required for the Metropolitan Colliery Project have been submitted to the Director-General for approval.</td><td>Noted</td></tr>
<tr><td></td><td>SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS – MINING</td><td></td><td></td><td></td></tr>
<tr><td></td><td>PERFORMANCE MEASURES</td><td></td><td></td><td></td></tr>
<tr><td>3/1</td><td>The Proponent shall ensure that the project does not cause any exceedances of the performance measures in Table 1.
Table 1: Subsidence Impact Performance Measures
<table>
<tr><th></th><th>Performance Measures</th></tr>
<tr><td>Water Resources</td><td></td></tr>
<tr><td>Catchment Yield to the Woronora Reservoir</td><td>Negligible reduction to the quality or quantity of water resources reaching the Woronora Reservoir.
No connective cracking between the surface and the mine.</td></tr>
<tr><td>Woronora Reservoir</td><td>Negligible leakage from the Woronora Reservoir, and negligible reduction in the water quality of Woronora Reservoir</td></tr>
<tr><td colspan="2">Water Courses</td></tr>
<tr><td>Waratah Rivulet between full supply level</td><td>Negligible environmental consequences (that is, no diversion of flows, no change in</td></tr>
</table></td><td>• Water Management Plan,14 Apr 2011
• Letter from DoP re Approval of Extraction Plan Long-walls 20-23 -Water Management Plan, May 2011
• Extraction Plan Long-walls 22-27 - Water Management Plan, Nov 2011
• Letter from DP&I re Approval of Extraction Plan Long-walls 23-27- Water Management Plan, 15 Apr 2014
• Extraction Plan Long-walls 23-27 - Water Management Plan, May 2011
• 2011 Annual Review</td><td>Performance indicators are developed in the Management Plans and performance reported in the Annual Reviews.
(refer to section 5.3.4.2 of this audit report).</td><td>Compliant Ongoing</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><td>of Woronora Reservoir and the main-gate of Long-wall 23 upstream of Pool P).</td><td>the natural drainage behaviour of pools, minimal iron staining, and minimal gas releases)</td></tr>
<tr><td>Eastern Tributary between full supply level of Woronora Reservoir and the main-gate of Long-wall 26.</td><td>Negligible environmental consequences over at least 70% of the stream length (that is no diversion of flows, no change in the natural drainage behaviour of pools, minimal iron staining and minimal gas releases).</td></tr>
<tr><td colspan="2">Biodiversity</td></tr>
<tr><td>Threatened species, populations, or ecological communities</td><td>Negligible impact</td></tr>
<tr><td>Swamps 76, 77 & 92</td><td>Sett through condition 4 below.</td></tr>
<tr><td colspan="2">Land</td></tr>
<tr><td>Cliffs</td><td>Less than 3% of the total length of cliffs (and associated overhangs within the mining area) experience mining-induced rock fall.</td></tr>
<tr><td colspan="2">Heritage</td></tr>
<tr><td>Aboriginal Heritage Sites</td><td>Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.</td></tr>
<tr><td>Items of historical or heritage significance at the Garrawarra Centre</td><td>Negligible damage (that is fine or hairline cracks that do not require repair), unless the owner of the item and the appropriate heritage authority agree otherwise in writing</td></tr>
<tr><td colspan="2">Built Features</td></tr>
<tr><td>Built Features</td><td>Safe, serviceable and repairable, unless the owner agrees otherwise in writing.</td></tr>
</table>
Note: The Proponent will be required to define more detailed performance indicators for each of these performance measures in the various management plans that are required under this approval (see condition 6 below).</td><td>• 2012 Annual Review
• 2013 Annual Review/AEMR
• 2014 Annual Review / AEMR</td><td></td><td></td></tr>
<tr><td></td><td>CATCHMENT MONITORING PROGRAM</td><td></td><td></td><td></td></tr>
<tr><td>3/2</td><td>The Proponent shall prepare and implement a comprehensive Catchment Monitoring Program for the project to the satisfaction of the Director-General. This program must:
(a) be prepared by suitably qualified and experienced experts whose appointment has been endorsed by the Director-General;
(b) be prepared in consultation with DWE, SCA and DECC;
(c) be approved by the Director-General before the Proponent is allowed to carry out any second workings in the mining area; and</td><td>• Letter from DoP re Endorsement of Experts for Catchment Management Plan, 19 Feb 2010
• Catchment Monitoring Program, CMP-R01-B,14 May 2010</td><td>The Catchment Monitoring Program prepared and submitted to the Director-General was approved 1 May 2010. Minor edits or amendments and formatting changes were approved on 14 November 2011 (comments from the SCA and NOW), 29 May 2013 and 25 August 2014:
(a) The Catchment Monitoring Program was prepared by Gilbert and Associates, Heritage Computing (experts endorsed by DP&I on 19 February 2010) and Metropolitan Coal;</td><td>Compliant</td></tr>
</table>

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	(d) include: • detailed baseline data of the existing surface and groundwater resources in the project area; • a program for the ongoing development and use of appropriate surface and groundwater models for the project; and • a program to: - monitor and assess any impacts of the project on the quantity and quality of surface and ground water resources in the project area, and in particular the catchment yield to the Woronora Reservoir; and - validate and calibrate the surface and groundwater models.	• Catchment Monitoring Program, CMP-R01-C,14 Nov 2011 • Catchment Monitoring Program, CMP-R01-D,29 May 2013 • Catchment Monitoring Program, CMP-R01-E, 25 Aug 2014	(b) Rev CMP-R01-A was distributed to the SCA, DECCW, NOW and DoP for consultation; (c) The Catchment Monitoring Program was approved by DoP on 14 May 2010 prior to second workings; (d) The Catchment Monitoring Program (CMP-R01-E) includes: • Section 3 Baseline Data, section 3.4 Surface Water (includes baseline data on surface water flow at Waratah Rivulet, Woronora River and O'Hares Creek and key water quality parameters for selected sites on the Waratah Rivulet, Eastern Tributary, Far-Eastern Tributary, Woronora River, Bee Creek, Honeysuckle Creek and Woronora Reservoir, section 3.5 Groundwater • Section 4.3 Surface and Groundwater Models - a numerical catchment model for the Waratah Rivulet and control catchment(s) have been developed using the AWBM • Section 5.3 Program to Monitor and Assess any Impacts on the Quantity and Quality of Surface and Ground water Resources - includes details of future monitoring for surface water flow, pool water levels, stream water quality and water quality of Woronora and Nepean Reservoir, and Section 4.3.2 Catchment yield model development, calibration and verification program.	
	SPECIFIC REQUIREMENTS FOR FURTHER MODELLING & ASSESSMENT			
3/3	If the subsidence effects and subsidence impacts of the project exceed the relevant predictions by more than 15% at any time after mining has progressed beyond the halfway mark of Long-wall 21, or if the profile of vertical displacement does not reflect predictions, then the Proponent shall use appropriate numerical modelling to supplement the subsequent predictions of subsidence effects and subsidence impacts for the project to the satisfaction of the D-G. *Note: The aim of the numerical modelling is to give a better insight into the mechanisms that may account for the differences between predicted and actual subsidence effects and impacts.*	• Subsidence Monitoring Program, dated April 2010 • Extraction Plan, Attachment 1, 14 May 2010 • Subsidence Monitoring Program, dated April 2014 • Extraction Plan, Attachment 1, April 2014 • 2011 Annual Review • 2012 Annual Review • 2013 Annual Review	A review of the subsidence survey results and comparison between the predicted and observed subsidence movements associated with Long-wall 20-22 extraction was conducted by Mine Subsidence Engineering Consultants (MSEC). The assessment found that subsidence impacts were less than that predicted within the accuracy expected from re-survey. Subsidence Monitoring Program and associated management processes are considered to be adequate.	**Compliant Ongoing**
3/4	The Proponent shall not undermine Swamps 76, 77 and 92 without the written approval of the Director-General. In seeking this approval, the Proponent shall submit the following information with the relevant Extraction Plan (see condition 6 below): (a) a comprehensive environmental assessment of the: • potential subsidence impacts and environmental consequences of the proposed Extraction Plan;	• Extraction Plan – Long-walls 20-22, 14 April 2010 • Extraction Plan – Long-walls 20-22 Figure 6 Upland Swamps • Letter from DI&I re Approval of Metropolitan MOP Amendment, 20 May 2010	Metropolitan Coal 2014 Annual Review Section 3.5.5.8 notes that Long-walls 20-22 do not undermine Swamps 76, 77 and 92. (a) a comprehensive environmental assessment of potential subsidence impacts and environmental consequences of the Extraction Plan, potential risks of adverse environmental consequences,; and	**Compliant**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	• potential risks of adverse environmental consequences; and • options for managing these risks; (b) a description of the proposed performance measures and indicators for these swamps; and (c) a description of the measures that would be implemented to manage the potential environmental consequences of the Extraction Plan on these swamps (to be included in the Biodiversity Management Plan – see condition 6(f) below), and comply with the proposed performance measures and indicators.	• Extraction Plan Long-walls 23-27 April 2014 • 2014 Annual Review section 3.5.5.8	options for managing the risks are addressed in the Extraction Plan sub-plans; (b) performance measures and indicators for the swamps are presented in the Water Management Plan, Catchment Monitoring Program and Biodiversity Management Plan; (c) The Biodiversity Management Plan prepared as part of the Extraction Plans for Long-wall 20-22 and Long-walls 23-27 addresses the requirements of condition 4: • Biodiversity Management Plan section 4 Revised Assessment of Potential Environmental Consequences – Subsidence Predictions • Biodiversity Management Plan section 5 Performance Measures and Indicators • Biodiversity Management Plan section 5 Performance Measures and Indicators and section 4.2 and 6.1 Upland Swamps	
	FIRST WORKINGS			
3/5	The Proponent shall not carry out first workings in the mining area that are not consistent with the approved mine plan without the written approval of the Director-General.	• Letter from DI&I re Approval of Metropolitan MOP Amendment, 20 May 2010	All mine workings have been undertaken in accordance with the approved mine plans and MOP.	**Compliant**
	SECOND WORKINGS			
	Extraction Plan			
3/6	The Proponent shall prepare and implement an Extraction Plan for all second workings in the mining area to the satisfaction of the Director-General. This plan must: (a) be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Director-General; (b) be approved by the Director-General before the Proponent is allowed to carry out the second workings covered by the Extraction Plan; (c) include a detailed plan for the second workings, which has been prepared to the satisfaction of DPI, and provides for adaptive management (from Long-wall 23 onwards); (d) include detailed plans of any associated surface construction works; (e) include the following to the satisfaction of DPI: • a coal resource recovery plan that demonstrates effective recovery of the available resource; • revised predictions of the conventional and non-conventional subsidence effects and subsidence impacts of the extraction plan, incorporating any relevant information that has been obtained since this approval; and	• Letter from DoP re Approval of Experts for Preparation of the Extraction Plan, 23 Sep 2009Letter from Planning NSW re Approval of the Extraction Plan, 14 May 2010 • Extraction Plan Long-walls 20-23, 14 May 2010: - Water Management Plan (Rev C) 14 Nov 2011 - Biodiversity Management Plan - Land Management Plan - Heritage Management Plan - Built Features Management Plan - Public Safety Management Plan • Extraction Plan Long-walls 23-27, 9 Apr 2014: - Water Management Plan Biodiversity Management Plan - Land Management Plan	The Extraction Plans for Long-walls 20-23 and Long-walls 23-27 were prepared to satisfy Schedule 3 condition 6 with supplementary stand-alone plans developed for each of the components in condition 6(d) to (g): (a) The appointment of the team of suitably qualified and experienced experts was endorsed by the Director-General on 23 September 2009. The Extraction Plans were prepared by Mine Subsidence Engineering Consultants, Gilbert and Associates, Heritage Computing, Cenwest Environmental Services, Flora Search, Bio-Analysis and Kayandel Archaeological Services. (b) The Extraction Plans were submitted to the Director-General and approved prior to any second workings occurring in the long-wall areas covered by the Plan. (c) A Coal Resource Recovery Plan, including a detailed plan for the second workings was provided in Appendix 1 of the Subsidence Monitoring Program.	**Compliant Ongoing**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	• a Subsidence Monitoring Program to: - validate the subsidence predictions; and - analyse the relationship between the subsidence effects and subsidence impacts of the Extraction Plan and any ensuing environmental consequences; (f) include a: • Water Management Plan, which has been prepared in consultation with DECC, SCA and DWE, to manage the environmental consequences of the Extraction Plan on watercourses (including the Woronora Reservoir), aquifers and catchment yield; • Biodiversity Management Plan, which has been prepared in consultation with DECC and DPI (Fisheries), to manage the potential environmental consequences of the Extraction Plan on aquatic and terrestrial flora and fauna, with a specific focus on swamps; • Land Management Plan, which has been prepared in consultation with SCA, to manage the potential environmental consequences of the Extraction Plan on cliffs, overhangs, steep slopes and land in general; • Heritage Management Plan, which has been prepared in consultation with DECC and the relevant Aboriginal groups, to manage the potential environmental consequences of the Extraction Plan on heritage sites or values; • Built Features Management Plan, which has been prepared in consultation with the owner of the relevant feature , to manage the potential environmental consequences of the Extraction Plan on any built features; and (g) include a Public Safety Management Plan, which has been prepared in consultation with DPI and the DSC (for any mining within the DSC notification area), to ensure public safety in the mining area. *Note: In accordance with condition 12 of schedule 2, the preparation and implementation of Extraction Plans for second workings may be staged, with each plan covering a defined area of second workings. In addition, these plans are only required to contain management plans that are relevant to the specific second workings that are being carried out.*	- Heritage Management Plan - Built Features Management Plan - Public Safety Management Plan	(d) Plans of any associated surface construction works are addressed in the Construction Management Plan for Surface Works, August 2010 (e) Other sub-plans approved by DPI (DII) • Coal Resource Recovery Plan • Subsidence Monitoring Program (f) plus: • Water Management Plan • Biodiversity Management Plan • Land Management Plan • Heritage Management Plan • Built Features Management Plan(s) for Transgrid, Integral Energy, Nextgen, Optus, Railcorp, RTA, Sydney Water, Telstra and WCC (g) Public Safety Management Plan A new Extraction Plan is prepared for each Long-wall (or group of Long-wall Panels) for approval prior to the commencement of development or coal extraction.	
3/7	In addition to the standard requirements for management plans (see condition 2 of schedule 7), the Proponent shall ensure that the management plans required under condition 6(f) above include: (a) a program to collect sufficient baseline data for future Extraction Plans;	Extraction Plan Long-walls 20-23, 14 Apr 2010 Extraction Plan Long-walls 23-27, 9 Apr 2014	(a) Section 11 of the Water Management Plan, Land Management Plan and Biodiversity Management Plan address collection of baseline data for Future Extraction Plans; and section 13 of the Heritage Management Plan addresses Future Extraction Plans. (b) Section 4 of the Water Management Plan / Land Management Plan/ and Biodiversity Management	**Compliant Ongoing**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	(b) a revised assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this approval; (c) a detailed description of the measures that would be implemented to remediate predicted impacts; and (d) a contingency plan that expressly provides for adaptive management.		Plan address Annual Review and Improvement of Performance. (c) plans of any associated surface construction works to remediate predicted impacts are included in the appropriate sections of the Extraction Plan and sub-plans; (d) Section 12 of the Water Management Plan / Land Management Plan/ and Biodiversity Management Plan address Annual Review and Improvement of Performance including consideration of adaptive management.	
	Payment of Reasonable Costs			
3/8	The Proponent shall pay all reasonable costs incurred by the Department to engage independent experts to review the adequacy of any aspect of the Extraction Plan.		No requests for payment of costs for independent experts to review the Extraction Plan had been received from the Department at the date of this audit.	**Noted**
	RESEARCH PROGRAM			
3/9	The Proponent shall prepare and implement a Research Program for the project to the satisfaction of the D-G, and allocate $320,000 towards the implementation of the program. This program must: (a) be prepared in consultation with DWE, SCA, DECC and DPI; (b) be submitted to the Director-General for approval by the end of 2010; (c) be targeted at genuine research, as opposed to implementing the matters required by this approval; and (d) be directed at encouraging research into improving: • the prediction of valley closure and upsidence, and the resultant subsidence impacts; • the assessment of the environmental consequences of subsidence impacts on natural features; • the remediation of subsidence impacts on watercourses; • the understanding of subsidence impacts and their environmental consequences on swamps; • the conservation of the Eastern Ground Parrot on the Woronora Plateau; or • the environmental management of underground mining operations in the Southern Coalfield.	• Proposed Metropolitan Coal Research Program, Nov 2010 • Letter from DP&I re Approval of Research Program, 27 May 2011	Payment of the funds for progress of the components of the Research Program are paid on invoice(s) submitted for each component as they are undertaken. The Research Program was: (a) Prepared in consultation with DECC, SCA and DP&I. DECC proposed a component within the Research Program that was included in the approved Research Program; (b) The Research Program was submitted to DP&I on 4 November 2010 and approved on 27 May 2011; (c) The proposals provided by UNSW, Heritage Computing and DECC were targeted at genuine research; (d) The Research Program proposed by Peabody involved: • UNSW - research into improving the prediction of valley closure and up-sidence, and the resultant subsidence impacts and assessment of the environmental consequences of subsidence impacts on natural features; • DECC proposed research into conservation of the Eastern Ground Parrot on the Woronora Plateau; and • Heritage Computing proposed management of underground mining operations	**Compliant Ongoing**
3/10	The Proponent shall obtain the Director-General's approval for the allocation of any funding under this program.	Letter from Planning re Approval of Metropolitan Colliery Research Program, 27 May 2011	The approval of the Research Program and allocation of funding under the program was approved by the Director General on 3 November 2011.	**Compliant**

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td colspan="2">CONSTRUCTION MANAGEMENT – WORONORA SPECIAL AREA</td><td></td><td></td></tr>
<tr><td>3/11</td><td>The Proponent shall prepare and implement a Construction Management Plan for all surface construction works (excluding remediation or rehabilitation works) in the Woronora Special Area to the satisfaction of the Director-General. This plan must be prepared in consultation with SCA, include detailed plans of the proposed construction works, and be approved by the Director-General before the Proponent is allowed to carry out the construction works.</td><td>• Letter from SCA re Review of the Construction Management Plan, 24 Sep 2010
• Construction Management Plan, Nov 2011
• Letter to DP&I re Approval Construction Management Plan, 14 Nov 2011
• Surface Works Assessment Form – Deep Groundwater Piezometer Boreholes, Mar 2012
• Surface Works Assessment Form – Swamp Piezometer Boreholes, Apr 2012
• Surface Works Assessment Form – Subsidence Survey Lines, Sep 2013
• Surface Works Assessment Form – Seismic Survey Lines, Jul 2014</td><td>A Construction Management Plan for the surface works for the Eastern Tributary and Honeysuckle Creek Gauging Stations construction in the Woronora Special Area, was prepared in consultation with the SCA and submitted to DoP for approval on 26 July 2011 prior to commencement of the construction works.

Surface Works Assessment Forms were prepared prior to commencement of the construction works for:
• three deep groundwater bores (installed from October 2012 to September 2013);
• seven upland swamp groundwater bores (installed in March 2013);
• the survey base station (constructed from December 2012 to February 2013);
• construction of the subsidence survey lines (commenced in December 2013), and
• seismic survey lines July 2014.</td><td>Compliant</td></tr>
<tr><td></td><td colspan="2">SCHEDULE 4 SPECIFIC ENVIRONMENTAL CONDITIONS – GENERAL</td><td></td><td></td></tr>
<tr><td></td><td colspan="2">NOISE</td><td></td><td></td></tr>
<tr><td></td><td colspan="2">Noise Impact Assessment Criteria</td><td></td><td></td></tr>
<tr><td>4/1</td><td>By the end of 2014, the Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 2 at any residence on privately-owned land, or on more than 25% of any privately-owned land.
Table 2: Noise Impact Assessment Criteria
<table>
<tr><td>Day</td><td>Evening</td><td>Night</td><td>Night</td></tr>
<tr><td colspan="3">LAeq(15 min)</td><td>LA1(I min)</td></tr>
<tr><td>50 dB(A)</td><td>45 dB(A)</td><td>45 dB(A)</td><td>50 dB(A)</td></tr>
</table></td><td></td><td>Noise monitoring results in March 2015 indicated compliance with the noise impact assessment criteria specified in Schedule 4 condition 1.
It is noted that at the time of the noise survey in March 2015 that the change over from long-wall 23B to long-wall 24 was occurring and the CHPP was not operating at full capacity. The noise survey to be conducted in June 2015 will occur when the CHPP is operating at normal loads and will provide a more representative noise level at the residence monitoring locations.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td colspan="2">Noise Acquisition Criteria</td><td></td><td></td></tr>
<tr><td>4/2</td><td>If after 2014, the noise generated by the project exceeds the criteria in Table 3 at any residence on privately-owned land, or on more than 25% of any privately-owned land, then the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 5-7 of schedule 5.</td><td></td><td>This condition became active after the end of 2014. No exceedance of the noise criteria was indicated in the March 2015 noise survey.</td><td>Not triggered</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>Table 3: Noise Acquisition Criteria<table><tr><td>Day
LAeq(15 min)</td><td>Evening
LAeq(15 min)</td><td>Night
LAeq(15 min)</td></tr><tr><td>55 dB(A)</td><td>50 DB(A)</td><td>50 DB(A)</td></tr></table>Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2. For this condition to apply, the exceedances of the criteria must be systemic.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Additional Noise Mitigation Measures</td><td></td><td></td><td></td></tr>
<tr><td>4/3</td><td>If after 2014, the noise generated by the project exceeds the criteria in Table 4 at any residence on privately-owned land, then the Proponent shall, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the land owner. If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on 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 Director-General for resolution.
Table 4: Additional Noise Mitigation Criteria<table><tr><td>Day</td><td>Evening</td><td>Night</td></tr><tr><td colspan="3">LAeq(15 min)</td></tr><tr><td>53 dB(A)</td><td>48 dB(A)</td><td>48 dB(A)</td></tr></table>Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2.</td><td></td><td>This condition became active after the end of 2014. No exceedance of the noise criteria was indicated in the March 2015 noise survey.</td><td>Not triggered</td></tr>
<tr><td></td><td>Rail Noise</td><td></td><td></td><td></td></tr>
<tr><td>4/4</td><td>The Proponent shall only use locomotives that are approved to operate on the NSW rail network in accordance with noise limits L6.1 to L6.4 in RailCorp’s EPL (No. 12208) and ARTC’s EPL (No. 3142) or a Pollution Control Approval issued under the former Pollution Control Act 1970.</td><td>• Memo from Freight Corp re 82 and 90 Class Locomotive Noise Tests, 28 Feb 2000
• Letter from EPA re Approval of Works on 82 Class and 90 Class Locomotives, 22 Feb 2000</td><td>Clyde Engineering undertook noise mitigation works on the 82 and 90 Class locomotives in February 2000 and the works were approved by the EPA as satisfying condition 9 of the SRA Pollution Control Approvals No. 000993 and 000994.</td><td>Compliant</td></tr>
<tr><td>4/5</td><td>The Proponent shall use its best endeavours to minimise night-time movements of rolling stock on the Metropolitan rail spur.</td><td>• Meeting Minutes with Pacific National re Rail Noise, 29 Sep 2011</td><td>Night-time movements of rolling stock on the Metropolitan rail spur is minimised in accordance with this condition.</td><td>Noted</td></tr>
<tr><td>4/6</td><td>In the event of any rail noise or vibration issues that may arise from the haulage of coal over the life of the Project, the Proponent shall liaise with the CCC and the rail service provider to facilitate</td><td></td><td></td><td>Noted</td></tr>
</table>

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	resolution of these issues and implement additional noise reduction measures where appropriate.			
	Blasting			
4/7	The Proponent shall not undertake blasting operations at the surface facilities area without the written approval of the D-G.		No blasting has occurred at the Metropolitan Colliery site.	**Compliant**
	Noise Management Plan			
4/8	The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with DECC by a suitably qualified expert whose appointment has been approved by the Director-General, and submitted to the Director-General for approval by the end of June 2010. It must also provide for real-time noise monitoring.	• Metropolitan Mine Noise Management Plan, 26 Aug 2010 • Letter from DoP re Approval of Revised Noise Management Plan, 14 Apr 2011	The Noise Management Plan was prepared in consultation with the DECCW and submitted to the Director-General for approval in 2010. The Noise Management Plan was revised and approved on 14 April 2014. Section 7.1.1 Real time Continuous Monitoring and Location	**Compliant**
	AIR QUALITY & GREENHOUSE GAS			
	Odour			
4/9	The Proponent shall not cause or permit the emission of offensive odours from the site, as defined under Section 129 of the POEO Act.	• Metropolitan Coal Complaints Register	No odour complaints had been received by Metropolitan Colliery 2011 and 2015.	**Compliant Ongoing**
	Greenhouse Gas Emissions			
4/10	The Proponent shall implement all reasonable and feasible measures to minimise: (a) energy use on site; and (b) the scope 1, 2 and 3 greenhouse gas emissions produced on site, to the satisfaction of the D-G.	• NSW Energy Efficiency Action Strategy • Metropolitan Coal Energy Savings Action Plan, 2008 • Air Quality and Greenhouse Gas Management Plan, 14 Apr 2011 • Metropolitan ESAP First Annual Report, Mar 2010 • 2013 Annual Review/AEMR section 4.2.5	Energy efficiency improvements are on-going at Metropolitan Coal through improvement programs, specific development, improvements and upgrade projects. The 2013 Annual Review stated that energy savings of 1,450 GJ/y and 890 tCO2-e had been implemented. The new underground conveyor system and the reduced underground haulage distance will result in a significant improvement in energy efficiency and a reduced energy use per tonne of ROM produced. Upgrades to the mine ventilation systems and the CH&PP are also expected to result in improved energy performance per tonne of ROM coal.	**Compliant Ongoing**
	Air Quality Impact Assessment Criteria			
4/11	The Proponent shall ensure that dust generated by the project does not cause additional exceedances of the air quality impact assessment criteria listed in Tables 5, 6, and 7 at any residence on privately-owned land, or on more than 25 % of any privately-owned land. *Table 5: Long term impact assessment criteria for particulate matter*	• Air Quality and Greenhouse Gas Management Plan, 14 Apr 2011 • 2011 Annual Review • 2012 Annual Review • 2013 Annual Review/AEMR • 2014 Annual Review / AEMR	The Project Approval requires Metropolitan Coal ensures that dust generated by the Project does not cause exceedances of the air quality impact assessment criteria listed in Tables 5, 6 and 7 of Schedule 4 Condition 11. TSP is inferred from PM_{10} measurements using an industry 'rule of thumb' of 40-50% of TSP is PM_{10}.	**Compliant Ongoing**

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>90 µg/m^3</td></tr>
<tr><td>Particulate matter
< 10 µm (PM_{10})</td><td>Annual</td><td>30 µg/m^3</td></tr>
</table>
</td><td></td><td>The reported annual average TSP concentration during the 2011-2014 was compliant with the criteria and were reported as:
2012: 35 µg/m^3 (HVAS PM_{10} ➔ TSP)
2013: 36.3 µg/m^3 (HVAS PM_{10} ➔ TSP)
2014: 36.3 µg/m^3 (HVAS PM_{10} ➔ TSP)
The reported annual average PM_{10} concentration during the 2011-2014 period were as follows:
2012: 14.5 µg/m^3 (HVAS)
2013: 14.0 µg/m^3 (HVAS)
2014: 12.6 µg/m^3 (HVAS), 11.8 µg/m^3 (TEOM)</td><td rowspan="2"></td></tr>
<tr><td>
Table 6: Short term impact assessment criterion for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Particulate matter
< 10 µm (PM10)</td><td>24 hour</td><td>50 µg/m^3</td></tr>
</table>
</td><td>http://www.emergency.nsw.gov.au/ndd/2013_2014)</td><td>The reported maximum 24-hour average PM_{10} concentration during the 2011-2014 were compliant with the Table 6 criteria:
Sep 2011 - July 2012: 31.9 µg/m^3 (HVAS), 31 µg/m^3 (TEOM)
August 2012 – December 2013: 44.5 µg/m^3 (HVAS), 55.4 µg/m^3 (TEOM)
2014: 23 µg/m^3 (HVAS), 34.2 µg/m^3 (TEOM)</td></tr>
<tr><td>
Table 7: Long term impact assessment criteria for deposited dust
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr>
<tr><td>Deposited dust</td><td>Annual</td><td>2 g/m^2/month</td><td>4 g/m^2/month</td></tr>
</table>
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter – Deposited Matter - Gravimetric Method, or its latest version.
</td><td>

Air Quality and Greenhouse Gas Management Plan, 14 Apr 2011
2011 Annual Review
2012 Annual Review
2013 Annual Review/AEMR
2014 Annual Review / AEMR

</td><td>The reported maximum monthly dust deposition rates during the 2011-2014 were:

2011/12: 2.0 g/m^2/month at DG 3 and 8
2012: 2.2 g/m^2/month at DG8
2013: 1.7 g/m^2/month at DG7
2014: 2.2 g/m^2/month at DG7

It is noted that the annual average result compared against the 4 g/m^2/month criterion demonstrated that as none of the monthly maxima exceeded the 4 g/m^2/month criterion the annual average results comply.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Land Acquisition Criteria</td><td></td><td></td><td></td></tr>
<tr><td>4/12</td><td>If the dust generated by the project exceeds the criteria in Tables 8, 9, and 10 at any residence on privately-owned land, or on more than 25 percent of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 5-7 of schedule 5.</td><td>•</td><td>The TSP and PM_{10} results for the period 2011 to 2014 did not exceed the long term acquisition criteria. See results above.</td><td>Noted</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
Table 8: Long term land acquisition criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>90 µg/m^3</td></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>Annual</td><td>30 µg/m^3</td></tr>
</table>
</td><td>
• Environmental Protection Licence monitoring Summary to April 2015
• 2014 Annual Review and AEMR/Rehabilitation Report
• 2013 Annual Review Monitoring Summary 12. Air quality
• 2012 Annual Review Monitoring Summary 12. Air quality
</td><td>The TSP and PM_{10} results for the period 2011 to 2014 did not exceed the long term acquisition criteria. See results above.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>
Table 9: Short term land acquisition criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>Criterion</th><th>Percentile [1]</th><th>Basis</th></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>24 hour</td><td>150 µg/m^3</td><td>99[2]</td><td>Total[3]</td></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>24 hour</td><td>50 µg/m^3</td><td>98.6</td><td>Increment[4]</td></tr>
</table>
1Based on the number of block 24 hour averages in an annual period.
2Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the D-G in consultation with DECC.
3Background PM_{10} concentrations due to all other sources plus the incremental increase in PM10 due to the mine alone.
4Incremental increase in PM_{10} due to the mine alone.
</td><td>
• Environmental Protection Licence monitoring Summary to April 2015
• 2014 Annual Review and AEMR/Rehabilitation Report
• 2013 Annual Review Monitoring Summary 12. Air quality
• 2012 Annual Review Monitoring Summary 12. Air quality
</td><td>The PM_{10} and deposited dust results for the period 2011 to 2014 did not exceed the short term acquisition criteria for particulate matter. See comments and results above.

Note: The maximum 24-hour average PM_{10} concentration recorded by the TEOM on 19 October 2013 exceeded the assessment criterion of 50 µg/m^3. This is acknowledged to coincide with widespread NSW bushfires (ref: http://www.emergency.nsw.gov.au/ndd/2013_2014). Although this PM_{10} concentration exceeded the compliance criteria extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, illegal activities or any other activity are excluded under Table 9 Note 2 of the condition, so is not considered a non-compliance.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>
Table 10: Long term land acquisition criteria for deposited dust.
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr>
<tr><td>Deposited dust</td><td>Annual</td><td>2 g/m^2/month</td><td>4 g/m^2/month</td></tr>
</table>
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
</td><td>
• Environmental Protection Licence monitoring Summary to April 2015
• 2014 Annual Review and AEMR/Rehabilitation Report
• 2013 Annual Review Monitoring Summary 12. Air quality
• 2012 Annual Review Monitoring Summary 12. Air quality
</td><td>The reported maximum monthly dust deposition rates during the 2011-2014 were less than the annual average maximum. See comments and r5esults above.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Air Quality & Greenhouse Gas Management Plan</td><td></td><td></td><td></td></tr>
<tr><td>4/13</td><td>The Proponent shall prepare and implement an Air Quality & Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with DECC by a suitably qualified expert whose appointment has been approved by the Director-General, and</td><td>
• Air Quality and Greenhouse Gas Management Plan, Dec 2011
• Letter from Planning re Approval of Air Quality and
</td><td>An Air Quality and Greenhouse Gas Management Plan was prepared, submitted to the Director-General in June 2010, and approved on 14 April 2011.
The Air Quality and Greenhouse Gas Management Plan included real time air quality monitoring with TEOM PM_{10} monitoring and SMS alert system established at the</td><td>Compliant</td></tr>
</table>

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	submitted to the Director-General for approval by the end of June 2010. It must also provide for real-time air quality monitoring.	Greenhouse Management Plan, 14 Apr 2011	mine site. The TEOM unit has a minimum reporting interval of 10 minutes, a local storage of two months and a telemetry system connected to a computer for data storage and display of results via a wireless data link to a control point within the Metropolitan Coal offices.	
	SOIL & WATER			
	Discharges			
4/14	The Proponent shall ensure that all surface water discharges from the site comply with the discharge limits (both volume and quality) set for the project in any EPL.	• EPL 767 Environmental Earth Sciences Monitoring Data Reports, Aug-Nov 2011	All surface water discharges from the site are managed to comply with the discharge limits (both volume and quality) in EPL 767 conditions L2 and M6.1.	**Compliant**
	Surface Facilities Water Management Plan			
4/15	The Proponent shall prepare and implement a Water Management Plan for the surface facilities area and two ventilation shaft sites to the satisfaction of the Director-General. This plan must be prepared in consultation with DWE and DECC by a suitably qualified expert/ whose appointment has been endorsed by the Director-General, and submitted to the Director-General for approval by the end of June 2010. In addition to the standard requirements for management plans (see condition 2 of schedule 7), this plan must: (a) include a comprehensive water balance for the project; and (b) ensure that suitable measures are implemented to minimise water use, control erosion, prevent groundwater contamination, and comply with any surface water discharge limits. *Note: The water balance in this plan must be suitably integrated with both the Catchment Monitoring Program and the Water Management Plans that form part of the Extraction Plan.*	• Surface Facilities Water Management Plan, Sep 2010 • Surface Facilities Water Management Plan (Revision C), Apr 2014 • Letter from Planning re Approval of Surface Facilities Water Management Plan, 14 Apr 2011	The Surface Facilities Water Management Plan that includes the major surface facilities area and ventilation shaft sites was prepared in consultation with DECCW, NSW Office of Water and DoP in September 2010. The revised document addressing comments received from the authorities was submitted to the DP for approval on 14 April 2011. (a) The Australian Water Balance Model (AWBM) 3 was used to simulate runoff from rainfall on the various catchments across the major surface facilities area, with four different sub-catchment types modelled and catchment areas. The mine water make water balance has been suitably integrated with the Metropolitan Mine Catchment Monitoring Program and the Metropolitan Mine Long-walls 20-22 Water Management Plan. (b) Section 6 Table 1 of the Surface Facilities Water Management Plan provides management measures to minimise water use and section 8 outlines the performance indicators be used to assess whether suitable measures are in place to meet the objectives to minimise water use, control erosion, prevent groundwater contamination, and comply with any surface water discharge limits.	**Compliant**
	METEOROLOGICAL			
4/16	During the life of the project, the Proponent shall ensure that there is a suitable meteorological station in the vicinity of the surface facilities area that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	• Siting Report Automatic Weather Station, Novecom, 30 May 2011	The location of the automatic weather station installed at the Metropolitan Colliery at Robertson Street Helensburgh was assessed by Novecom in May 2011 and considered representative of the receiving environment. The weather station includes wind speed and direction, temperature, (2m and 10m), relative humidity and rainfall.	**Compliant Ongoing**

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td></td><td></td><td>The meteorological Station is supplemented with:<table><tr><th colspan="2">SentineX 90 Modules</th></tr><tr><td>M1
M2
D1

D2
J1
J2
J3</td><td>• Primary meteorological monitoring system
• Stockpile wind monitoring system
• TEOM ambient particulate monitoring system
• Portable dust monitoring system
• Stockpile level monitoring system
• Camps Creek discharge
• Camps Creek extraction</td></tr></table></td><td></td></tr>
<tr><td></td><td>TRANSPORT</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Parkes Street Intersection</td><td></td><td></td><td></td></tr>
<tr><td>4/17</td><td>By the end of 2010, the Proponent shall:
(a) undertake a road safety audit of the Parkes Street and Colliery Road intersection, in consultation with the RTA and WCC; and
(b) implement any recommendations of this audit,
to the satisfaction of the Director-General.</td><td>• Emails (various) between Metropolitan Colliery, RTA, Traffic Committee, and Consulting Civil Infrastructure Engineers (J Wyndham Prince)
• Stage 5 Road Safety Audit & Recommendations Report - Parkes Street & Colliery Road Intersection, Helensburgh, J Wyndham Prince, Sep 2010</td><td>Stage 5 Road Safety Audit & Recommendations Report - Parkes Street & Colliery Road Intersection, Helensburgh, was prepared for Peabody Energy by J Wyndham Prince, in September 2010.
A Draft Plan for the Parkes Street intersection was approved and discussions are ongoing with the Council, RTA and Traffic Committees in relation to progressing with the construction of the Parkes Street & Colliery Road Intersection as described in the approved plan.</td><td>Compliant Ongoing</td></tr>
<tr><td></td><td>Road Maintenance Contributions</td><td></td><td></td><td></td></tr>
<tr><td>4/18</td><td>From the end of 2009, the Proponent shall make a suitable annual contribution to WCC, WSC, and CC for the maintenance of local roads that are used as haulage routes by the project. If there is any dispute over the amount of the contribution, the matter must be referred to the Director-General for resolution.</td><td>• Regulatory Requirement Council Contributions, 7 Oct 2011
• Annual Contributions:
○ Wollongong City Council 8 Sep 2011
○ Wollondilly Shire Council, 5 Sep 2011
○ Campbelltown City Council, 4 Oct 2011
○ Wollongong City Council, 30 Nov 2013
○ Wollondilly Shire Council, 30 Nov 20131
○ Campbelltown City Council Tax Invoice No. 43408, 30 Nov 2013
○ Wollongong City Council, 30 Nov 2013
○ Wollondilly Shire Council, 30 Nov 2013</td><td>Contributions have been paid to the WCC ($55,000) on Invoice 404487601980163 dated 8 September 2011.
Contribution to Wollondilly Shire Council ($27,500) for road maintenance paid on Invoice No. 14288 dated 5 September 2011.
Contribution to Campbelltown City Council ($27,500) for road maintenance paid on Tax Invoice No. 43408 on 5 Oct 2011.
Contributions were made to Wollongong City Council, Campbelltown City Council and Wollondilly Shire Council by 30 November 2012.
Contributions were made to Wollongong City Council and Wollondilly Shire Council by 30 November 2013.</td><td>Compliant Ongoing</td></tr>
</table>

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>Road Transport Restrictions</td><td></td><td></td><td></td></tr>
<tr><td>4/19</td><td>The Proponent shall not:
(a) load coal or coal reject onto trucks, or transport it off site by road, outside the hours of 7am and 6pm Monday to Friday;
(b) transport more than 120,000 tonnes of coal off site by road in a calendar year; or
(c) transport any coal off site to the Port Kembla Coal Terminal by road.</td><td>• Traffic Management Plan, Apr 2011
• Letter from DP&I re Approval Traffic Management Plan, 14 Apr 2011 Approval of Modification (MOD 2), 9 Mar 2011</td><td>A Modification with respect to coal and coal reject trucking was approved by DP&I on 9 March 2011:
(a) Metropolitan Coal and its haulage contractors only load coal or coal reject into haulage trucks, or transport it off site by road, between of 7.00 am and 6.00 pm Monday to Friday
(b) A small amount of coal was transported by truck to the Corrimal and Coalcliff Coke Works prior to closure of the works in April 2014;
(c) No coal is transported off site to Port Kembla by road.</td><td>Compliant</td></tr>
<tr><td>4/20</td><td>During emergencies (such as the disruption of rail services) the Proponent may exceed the restrictions in condition 19 above with the written approval of the Director-General.</td><td></td><td></td><td>Noted</td></tr>
<tr><td></td><td>Monitoring</td><td></td><td></td><td></td></tr>
<tr><td>4/21</td><td>The Proponent shall monitor the amount of coal and coal reject transported from the site by road and rail each year, and report the results of this monitoring on its website every six months.</td><td>• 2011 AEMR/Annual Review
• 2012 AEMR/Annual Review
• 2013 AEMR / Annual Review
• 2014 Annual Review
• www.peabodyenergy.com.au/</td><td>Metropolitan Coal monitors the amount of product coal transported from site by road and by rail and the results are reported in the AEMR and on the Company website.
<table><tr><th></th><th>2011</th><th>2012</th><th>2013</th><th>2014</th></tr><tr><td></td><td colspan="4">Million tonnes</td></tr><tr><td>Product Coal</td><td></td><td></td><td></td><td></td></tr><tr><td>Rail</td><td>1.61</td><td>1.97</td><td>1.58</td><td>1.61</td></tr><tr><td>Road</td><td>0.14</td><td>0.14</td><td>0.18</td><td><0.1*</td></tr><tr><td>Coal Reject</td><td></td><td></td><td></td><td></td></tr><tr><td>Rail</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Road</td><td>0.15</td><td>0.20</td><td>0.32</td><td>0.38</td></tr></table>* Corrimal and Coalcliff Coke Works closed in 2014.</td><td>Compliant</td></tr>
<tr><td></td><td>Traffic Management</td><td></td><td></td><td></td></tr>
<tr><td>4/22</td><td>The Proponent shall prepare and implement a Traffic Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with the RTA, WCC, local schools and the CCC, and submitted to the Director-General for approval by the end of February 2010. The primary aim of this plan is to minimise the traffic impacts of the project on the residential areas and schools within Helensburgh.</td><td>• Traffic Management Plan, Mar 2011
• Letter from DoP re Approval of Traffic Management Plan, 14 Apr 2011</td><td>The Traffic Management Plan was prepared in consultation with the RTA, Wollongong City Council, local schools and the Community Consultative Committee and submitted to the Director-General and approved on 14 April 2011.</td><td>Compliant</td></tr>
<tr><td></td><td>VISUAL</td><td></td><td></td><td></td></tr>
<tr><td>4/23</td><td>The Proponent shall minimise the visual impacts, and particularly the off-site lighting impacts, of the surface facilities area and two ventilation shaft sites to the satisfaction of the Director-General.</td><td></td><td>Potential lighting impacts from the mine structures and activities have been reduced by installation of timers on external lights and administration building lights on site that were visible from nearest residents.</td><td>Compliant</td></tr>
</table>

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	WASTE			
4/24	The Proponent shall: (a) minimise the waste (including coal reject) generated by the project; and (b) ensure that the waste generated by the project is appropriately stored, handled, and disposed of, to the satisfaction of the Director-General.	• Waste Management Plan, Nov 2010 • Waste Management Plan, (Revision B) 14 Apr 2011	(a) Waste Hierarchy is applied to waste management and performance indicators were developed to assess the performance of waste management in particular measures to minimise waste (including coal reject) generated by Metropolitan Coal; and (b) section 7.2 describes Waste Storage, Handling and Disposal strategies.	**Compliant**
4/25	The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval by the end of June 2010.	Management Plan, Nov 2010 Letter from DP&I re Waste Management Plan Approval, 14 Apr 2011	The Waste Management Plan was submitted to the Director-General for approval prior to June 2010 and the Plan was approved in November 2010. A revision of the Plan was approved by DP&I on 14 April 2011.	**Compliant**
	SCHEDULE 5 ADDITIONAL PROCEDURES FOR AIR QUALITY AND NOISE MANAGEMENT		**Schedule 5 Procedures had not been activated at the date of this audit.**	
	NOTIFICATION OF LANDOWNERS			
5/1	If the results of the monitoring required in schedule 4 identify that impacts generated by the project are greater than the relevant impact assessment criteria in schedule 4, except where a negotiated agreement has been entered into in relation to that impact, then the Proponent shall, within 2 weeks of obtaining the monitoring results, notify the Director-General, the affected landowners and tenants (including tenants of mine owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the criteria in schedule 4.			**Not triggered**
5/2	If the results of monitoring required in Schedule 4 identify that impacts generated by the project are greater than the relevant air quality impact assessment criteria in schedule 4, then the Proponent shall send the relevant landowners and tenants (including tenants of mine owned properties) a copy of the NSW Health fact sheet entitled “Mine Dust and You” (and associated updates) in conjunction with the notification required in condition 1.			**Not triggered**
	INDEPENDENT REVIEW			
5/3	If a landowner considers the project to be exceeding the impact assessment criteria in schedule 4, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land. If the Director-General is satisfied that an independent review is warranted, the Proponent shall within 2 months of the Director-General’s decision: (a) consult with the landowner to determine his/her concerns; (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to:			**Not triggered**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	• determine whether the project is complying with the relevant impact assessment criteria in schedule 4; and • identify the source(s) and scale of any impact on the land, and the project's contribution to this impact; and (c) give the Director-General and landowner a copy of the independent review.			
5/4	If the independent review determines that the project is complying with the relevant impact assessment criteria in schedule 4, then the Proponent may discontinue the independent review with the approval of the Director-General. If the independent review determines that the project is not complying with the relevant impact assessment criteria in Schedule 4, then the Proponent shall: (a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria, and conduct further monitoring to determine whether these measures ensure compliance; or (b) secure a written agreement with the landowner to allow exceedances of the relevant impact assessment criteria, to the satisfaction of the Director-General. However, if the further monitoring referred to under paragraph (a) above determines that the project is complying with the relevant impact assessment criteria, then the Proponent may discontinue the independent review with the approval of the Director-General. If the independent review determines that the project is not complying with the relevant land acquisition criteria in schedule 4, then the Proponent shall offer to acquire all or part of the landowner's land in accordance with the procedures in conditions 5-7 below, to the satisfaction of the Director-General.			**Not triggered**
	LAND ACQUISITION			
5/5	Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent shall make a binding written offer to the landowner based on: (a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the project the subject of the project application, having regard to the: • existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and • presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request,			**Not triggered**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of 'reasonable and feasible measures' in condition 3 of schedule 4 or condition 4(a) of this schedule; (b) the reasonable costs associated with: • relocating within the Wollongong local government areas, or to any other local government area determined by the Director-General; • obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and (c) reasonable compensation for any disturbance caused by the land acquisition process. However, if following this period, the Proponent and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution. Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute (the API) to appoint a qualified independent valuer to: (a) consider submissions from both parties; (b) determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above; (c) prepare a detailed report setting out the reasons for any determination; and (d) provide a copy of the report to both parties. Within 14 days of receiving the independent valuer's report, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination. However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the D-G for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Director-General shall determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above and the independent valuer's report. Within 14 days of this determination, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the Director-General's determination. If the landowner refuses to accept the Proponent's binding written offer under this condition within 6 months of the offer being made,			

<table>
<tr><th>Condition No.</th><th>Project Approval 08_0149 Condition</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>then the Proponent's obligations to acquire the land shall cease, unless the Director-General determines otherwise.</td><td></td><td></td><td></td></tr>
<tr><td>5/6</td><td>The Proponent shall pay all reasonable costs associated with the land acquisition process described in condition 5 above.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>5/7</td><td>If the Proponent and landowner agree that only part of the land shall be acquired, then the Proponent shall also pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.</td><td></td><td></td><td>Noted</td></tr>
<tr><td></td><td>SCHEDULE 6 REHABILITATION & OFFSETS</td><td></td><td></td><td></td></tr>
<tr><td></td><td>REHABILITATION</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Rehabilitation Objectives</td><td></td><td></td><td></td></tr>
<tr><td>6/1</td><td>The Proponent shall achieve the rehabilitation objectives in Table 11 to the satisfaction of the Director- General of DPI.
Table 11: Rehabilitation Objectives
<table>
<tr><th>Domain</th><th>Rehabilitation objective</th></tr>
<tr><td>Surface Facilities Area</td><td>Set through condition 2 below</td></tr>
<tr><td>Waratah Rivulet, between the downstream edge of Flat Rock Swamp and full supply level of the Woronora Reservoir; and
Eastern Tributary, between the main gate of Long-wall 26 and full supply level of the Woronora Reservoir.</td><td>Restore surface flow and pool holding capacity as soon as reasonably practicable.</td></tr>
<tr><td>Cliffs</td><td>Ensure that there is no safety hazard beyond that</td></tr>
<tr><td>Other land affected by the project</td><td>Restore ecosystem function, including maintaining or establishing self-sustaining native ecosystems:
• comprised of local native plant species;
• with a landform consistent with the</td></tr>
<tr><td>Built features</td><td>Repair/restore to pre-mining condition or equivalent</td></tr>
</table></td><td>• Extraction Plan – Water Management Plans
• 2011 Annual Review
• 2012 Annual Review
• 2013 Annual Review/AEMR
• 2014 Annual Review / AEMR
• Rehabilitation Management Plan
• Extraction Plan - Built Features Management Plans
• Extraction Plan – Public Safety Management Plan</td><td>The Metropolitan Coal Rehabilitation Management Plan provides a description of the measures to be taken to address the rehabilitation objectives of this condition.
Waratah Rivulet and Eastern Tributary:
Section 7.1 Rehabilitation of Surface Disturbance Areas, and section 7.2 Stream Pool /Rock Bar Remediation provide an outline of the measures to be implemented to achieve the rehabilitation objectives with monitoring conducted and reported in the Annual Review.
• 2012 Annual review states that stream remediation activities have commenced at Pools A and F on the Waratah Rivulet in accordance with approvals obtained from the SCA
• 2013 Annual review states that no stream remediation activities were conducted on the Waratah Rivulet during the reporting period as access via Fire Road 9H was restricted. While access was restricted, Metropolitan Coal commissioned a Continued Improvement Study to assess the efficacy of the stream remediation methodology.
• 2014 Annual Review states that stream remediation activities commenced at Pool F in June 2014, and stream remediation activities will be conducted at Flat Rock Crossing (Pools G and G1), in 2015.
Other land affected by the project:
• Rehabilitation Management Plan section 5.4 addresses progress of the rehabilitation and remediation measures in achieving the rehabilitation objective for other land affected by the Project;
Built Features:</td><td>Compliant Ongoing</td></tr>
</table>

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	Community — Minimise the adverse socio-economic effects associated with mine closure including the reduction in local and regional employment. Ensure public safety.		• Extraction Plan - Built Features Management Plans address rehabilitation objectives; **Community** • Extraction Plan – Public Safety Management Plan outlines community matters.	
	Rehabilitation Strategy – Surface Facilities Area			
6/2	By the end of October 2011, the Proponent shall prepare a Rehabilitation Strategy for the surface facilities area to the satisfaction of the Director-General. This strategy must: (a) be prepared by a team of suitably qualified and experienced experts whose appointment has been endorsed by the Director-General; (b) be prepared in consultation with relevant stakeholders, including WCC and the CCC; (c) investigate options for the future use of the area upon the completion of mining; (d) describe and justify the proposed rehabilitation strategy for the area; and (a) define the rehabilitation objectives for the area, as well as the proposed completion criteria for this rehabilitation.	• Letter from DP&I re Endorsement of Experts, 8 Oct 2011 • Rehabilitation Strategy, Oct 2011 • Letter from DP&I re Approval of Rehabilitation Strategy, 5 Dec 2011	Metropolitan Coal prepared a Rehabilitation Strategy for the Surface Facilities Area and submitted to the Director-General on 26 October 2011: (a) The Rehabilitation Strategy was prepared by a team of suitably qualified experts approved by DP&I on 8 October 2011: • Reece McDougall, Heritage Consultant, Godden Mackay Logan Pty Ltd. • Elizabeth Norris, Ecologist/Botanist, Eco Logical Australia. • Allan Watson, Civil Engineering Consultant, Allan Watson Associates Pty Ltd. (b) Consultation occurred with Wollongong City Council on (26 September 2011), Community Consultative Community (2 August 2011 and 16 August 2011), and the Helensburgh and District Historical Society (2 August 2011 and 8 August 2011). (c) Section 4 Future Land Use Options RS, outlines the potential future land use options and associated key benefits and issues (d) Section 5 Rehabilitation Objectives (e) Section 6 Completion Criteria	**Compliant**
	Progressive Rehabilitation			
6/3	To the extent that mining operations permit, the Proponent shall carry out rehabilitation progressively, that is, as soon as reasonably practicable following the disturbance.	• Rehabilitation Management Plan, 14 May 2010 • Rehabilitation Management Plan (revised), 22 May 2014	In 2013, approximately 7,200 native plants were planted in portions of Zones 1, 2, 3 and 4 and targeted areas with low regeneration of native species. The plantings were mainly along Parkes Street and Helensburgh Gully.	**Compliant Ongoing**
	Rehabilitation Management Plan			
6/4	The Proponent shall prepare and implement a Rehabilitation Management Plan for the project to the satisfaction of the Director-General of DPI. This plan must be prepared in consultation with the relevant stakeholders, and submitted to DPI for approval prior to carrying out any second workings in the mining area. *Note: In accordance with condition 12 of schedule 2, the preparation and implementation of Rehabilitation Management Plans is likely to be staged, with each plan covering a defined area*	• Rehabilitation Management Plan, 14 May 2010 • Letter from DP&I re Approval of Rehabilitation Management Plan (RMP-R01-A), 14 May 2010 • Letter from DI&I re Approval of Rehabilitation Management Plan (RMP-R01-A), 22 Oct 2010	The Rehabilitation Management Plan was prepared and submitted to the DP&I and DTIRIS-DRE and approved on the 14 May 2010. The Rehabilitation Management Plan was distributed to the SCA, DECCW, NSW Office of Water, I&I NSW (Fisheries), DoP and I&I NSW (Mineral Resources).	**Compliant**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	(or domain) for rehabilitation. In addition, while mining operations are being carried out, some of the proposed remediation or rehabilitation measures may be included in the detailed management plans that form part of the Extraction Plan. If this is the case, however, then the Proponent will be required to ensure that there is good cross-referencing between the various management plans.	• Rehabilitation Management Plan (RMP-R01-B), 22 Oct 2010 • Rehabilitation Management Plan (rRMP-R01-C), 20 Sep 2011 • Rehabilitation Management Plan (RMP-R01-E), 22 May 2014 • Letter from DRE re Approval of Rehabilitation Management Plan (RMP-R01-E), 22 May 2014	Revisions of the Rehabilitation Management Plan occurred following comments from DI&I (Mineral Resources), SCA and DoP (22 October 2010), and comments from the SCA (22 May 2014).	
	OFFSETS			
	Catchment Improvement Works			
6/5	The Proponent shall: (a) pay SCA $100,000 by the end of 2011 to carry out catchment improvement works within the Woronora catchment area; or (b) carry out catchment improvement works within this area that have an equivalent value to the satisfaction of SCA.		Metropolitan Coal has consulted with SCA to carry out two projects (rehabilitation of a walking track and a quarry site within the SCA area) plus a weed control program, following consultation and agreement with the SCA in December 2011. It is understood that the required $100K grant for rehabilitation in the SCA catchment area was used to complete the grouting works upstream of Flat Rock Crossing cross the creek sections impacted by LWs 1 to 18 (Pools A and F).	**Compliant**
	Offsets			
6/6	If the Proponent exceeds the performance measures in Table 1 of this approval, and either (a) the contingency measures implemented by the Proponent have failed to remediate the impact; or (b) the Director-General determines that it is not reasonable or feasible to remediate the impact, then the Proponent shall provide a suitable offset to compensate for the impact to the satisfaction of the Director-General. *Note: Any offsets required under this condition must be proportionate with the significance of the impact.*			**Noted**
	SCHEDULE 7 ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING			
	ENVIRONMENTAL MANAGEMENT			
	Environmental Management Strategy			
7/1	The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. The strategy must: (a) be submitted to the Director-General for approval by the end of September 2009; (b) provide the strategic framework for environmental management of the project;	• Environmental Management Strategy, Sep 2009 • Environmental Management Strategy (amended), 14 Nov 2011	The Environmental Management Strategy (EMS) was prepared and implemented for the Metropolitan Colliery operations: (a) Environmental Management Strategy was prepared and submitted to the DoP in September 2009. The EMS was amended and approved on 14 November 2011	**Compliant**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	(c) identify the statutory approvals that apply to the project; (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project; (e) describe the procedures that would be implemented to: • keep the local community and relevant agencies informed about the operation and environmental performance of the project; • receive, handle, respond to, and record complaints; • resolve any disputes that may arise during the course of the project; • respond to any non-compliance; and • respond to emergencies; (f) include: • copies of the various strategies, plans and programs that are required under the conditions of this approval once they have been approved; and • a clear plan depicting all the monitoring currently being carried out within the project area.		(b) The EMS provides the strategic framework for environmental management of the Metropolitan Colliery operations. (c) Section 3 Statutory Requirements (d) Section 5 Environmental Management Responsibility, Personnel and Roles (e) Procedures for implementation of the EMS: • Section 6.1 Information Dissemination • Section 6.2 Complaints and Response Procedures • Section 6.3 Dispute Resolution • Sections 7 Incidents and section 8 Response to Non-Compliances • Section 9 Emergency Response (f) Section 3 Statutory Requirements; Section 3.1 Table 2 summarises Environmental Management Plans and Monitoring Plans Metropolitan prepared to satisfy the Project Approval and Attachment 1 Current Monitoring Locations, Figure 1-1B and Figure 1-1C) depict the surface water quantity and quality monitoring sites.	
	Management Plan Requirements			
7/2	The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data; (b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures /criteria; (d) a program to monitor and report on the: • impacts and environmental performance of the project; • effectiveness of any management measures (see c above); (e) a contingency plan to manage any unpredicted impacts and their consequences; (f) a program to investigate and implement ways to improve the environmental performance of the project over time; (g) a protocol for managing and reporting any: • incidents;	• Environmental Management Strategy • Catchment Monitoring Program • Extraction Plan • Subsidence Monitoring Program (including a Coal Resource Recovery Plan); • Water Management Plan • Biodiversity Management Plan • Land Management Plan • Heritage Management Plan • Built Features Management Plan; • Public Safety Management Plan • Construction Management Plan – Woronora Special Area • Construction Management Plan – Woronora Special Area • Noise Management Plan	Management Plans have generally been prepared in a format that addresses the components of this condition: (a) baseline data is addressed in section 5 of the Management Plans. The Extraction Plan Water Management Plans section 6.2 provide baseline data for stream features, surface water flow, pool water levels, stream water quality and Woronora reservoir water quality. The Surface Facilities Water Management Plan Section 5provides baseline data for water use, discharge and stream water quality. The Catchment Monitoring Program Section 3.4 provides baseline data for stream features, surface water flow, pool water levels, stream water quality and Woronora reservoir water quality. (b) Relevant statutory requirements are presented in section 3 of the Management Plans and performance criteria and mitigation measures are included in the Management Plans in section 5; (c) measures implemented to comply with the relevant statutory requirements/ limits, or performance measures are included in section 5 or 8 of the Management Plans. (d) programs to monitor and report on the implementation of the Management Plan are addressed in the Reporting section.	**Compliant**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	• complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and (h) a protocol for periodic review of the plan.	• Air Quality and Greenhouse Gas Management Plan • Surface Facilities Water Management Plan • Traffic Management Plan • Waste Management Plan	(e) a contingency plan to manage any unpredicted impacts and their consequences is addressed in section 9 of the Management Plans. (f) a program to investigate and implement ways to improve the environmental performance of the project over time is addressed in section 12 of the Management Plans. (g) a protocol for managing and reporting any incidents, complaints, non-compliances with statutory requirements or exceedances of the impact assessment criteria and/or performance criteria is addressed in section 13 Reporting Incidents and Complaints, of the Management Plans. (h) Section 2 of the Management Plans address review and update of the Plans. All management plans are required to be reviewed within 3 months of submission of the Annual Review (Schedule 7 condition 3), an incident report (Schedule 7 condition 6) or an audit (Schedule 7 condition 8), or following any Modification to the Project Approval	
	Annual Review			
7/3	By the end of October 2010, and annually thereafter, the Proponent shall review the environmental performance of the project to the satisfaction of the Director-General. This review must: (a) describe the works that were carried out in the past year, and the works that are proposed to be carried out over the next year; (b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the • the relevant statutory requirements, limits or performance measures/criteria; • the monitoring results of previous years; and • the relevant predictions in the EA, PPR, and Extraction Plan; (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; (d) identify any trends in the monitoring data over the life of the project; (e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and	• 2011 Annual Review • 2012 Annual Review • Letter from DP&I re Acceptance of Annual Review, 16 Nov 2012 • 2013 Annual Review • Letter from DP&I re Acceptance of Annual Review, 26 May 2014 • 2014 Annual Review • Letter from DP&I re Acceptance of Annual Review, 8 May 2015	The Annual Review of the Metropolitan Coal operations has been prepared for the period 1 August to 31 July each year and submitted to the Director-General: (a) section 2 Works During the Reporting Period and section 7 Works Proposed in the Next Reporting Period (b) to (e) Section3 Underground Mine and Surrounds and Section 4 Surface Facilities; (f) section 7 Works Proposed in the Next Reporting Period. The 2013 Annual Review was prepared in accordance with Project Approval Schedule 7 condition 3 for the period 1 August 2012 to 31 December 2013 and included the requirements for the Annual Environmental Management Report (AEMR), prepared to satisfy CCL 703 condition 3, and the Environmental Management Report required for ML 1610. The 2014 Annual Review was prepared in accordance with Project Approval Schedule 7 condition 3 for the period January 2014 to December 2014 and included the requirements for the Annual Environmental Management Report (AEMR), prepared to satisfy CCL	**Compliant**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	(f) describe what measure will be implemented over the next year to improve the environmental performance of the project.		703 condition 3, and the Environmental Management Report required for ML 1610.	
	Revision of Strategies, Plans & Programs			
7/4	Within 3 months of the submission of an: (a) audit under condition 8 of schedule 7; (b) incident report under condition 6 of schedule 7; and (c) annual review under condition 3 of schedule 7, the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General. Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.		Actions arising from the Annual Review /AEMR / audits are addressed in section 1.4 of the following Annual Review Report.	**Compliant Ongoing**
	Community Consultative Committee			
7/5	The Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General. This CCC must be operated in general accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007, or its latest version) to the satisfaction of the Director-General. *Note: The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval. In accordance with the Guideline, the Committee should comprise an independent chair and appropriate representation from the Proponent, affected councils, recognised environmental groups and the general community in Helensburgh and the area of the project.*		The Community Consultative Committee (CCC) for the Metropolitan Colliery Mine project meets quarterly in the Metropolitan Coal Administration Office (Boardroom). The CCC Meeting is conducted generally in accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects, and is chaired by Ms Margaret MacDonald-Hill. Minutes of the CCC Meetings are taken by Metropolitan Coal, distributed to the CCC Members and placed on the Company website.	**Compliant**
	REPORTING			
	Incident			
7/6	The Proponent shall notify the Director-General and any other relevant agencies of any incident associated with the project as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident.	Incident Report submitted to DP&I and OEH re Water Runoff to Camp Creek, 22 Aug 2011	Incident Report was submitted to DP&I and OEH on 22 August 2011: Water run-off from a Virgin Excavated Natural Material stockpile in the drift construction area at the Colliery drained via an on-site clean water drain to Helensburgh Creek Culvert and subsequently into Camp Creek. No environmental incidents were reported in 2012 to May 2015.	**Compliant Ongoing**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	Regular			
7/7	The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval, and to the satisfaction of the Director-General.		Metropolitan Coal provides regular reporting of environmental performance of the project and this is provided on the Company website.	**Compliant Ongoing**
	INDEPENDENT ENVIRONMENTAL AUDIT			
7/8	By end of December 2011, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must: (a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Director-General; (b) include consultation with the relevant agencies; (c) assess the environmental performance of the project and assess whether it is complying with the relevant requirements in this approval and any relevant EPL or Mining Lease (including any assessment, plan or program required under these approvals); (d) review the adequacy of strategies, plans or programs required under these approvals; and, if appropriate; and (e) recommend measures or actions to improve the environmental performance of the project, and/or any assessment, plan or program required under these approvals. *Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Director-General.*	• Independent Environmental Audit, Nov 2011 • Letter from DP&E Endorsing Experts for the Independent Environmental Audit, 16 Dec 2014 • Letter to SCA re Independent Environmental Audit, 12 May 2015 • Letter to DRE re Independent Environmental Audit, 12 May 2015 • Letter to OEH/EPA re Independent Environmental Audit, 12 May 2015	An Independent Environmental Audit of the Metropolitan Coal Project was conducted in November / December 2011 and the report is available on the Metropolitan Coal website: This current Independent Environmental Audit was conducted between May and June 2015: (a) by suitably qualified, experienced and independent team of experts endorsed by DP&E on 16 December 2014; (b) included consultation with the OEH/EPA, DRE, and SCA (no specific requests for assessment by the audit were received); (c) assessed environmental performance of the project for compliance with requirements in this approval, EPL and relevant Mining Lease conditions (Attachment a to D); (d) reviewed adequacy of strategies, plans or programs required under these approvals (section 5); and (e) recommend measures or actions to improve the environmental performance of the project, where relevant (section 6 Conclusions and Recommendations	**Compliant Ongoing**
7/9	Within 6 weeks of the completing of this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General, together with its response to any recommendations contained in the audit report.	• Letter to DP&I re Response to Independent Environmental Audit , 20 Jun 2012	An action Table addressing the recommendations in the 2011 Independent Environmental Audit was provided to the DP&I on 20 June 2012.	**Compliant**
	ACCESS TO INFORMATION			
7/10	From the end of 2009, the Proponent shall make the following information publicly available on its website: (a) a copy of all current statutory approvals; (b) a copy of the current environmental management strategy and associated plans and programs; (c) a summary of the monitoring results of the project, which have been reported in accordance with the various plans and programs approved under the conditions of this approval; (d) a complaints register, which is to be updated on a monthly basis;	http://www.peabodyenergy.com/content/417/australia-mining/new-south-wales/metropolitan-mine/approvals-plans-and-reports-metropolitan-mine	Information publicly available on the Metropolitan Coal website include: (a) Approvals - a copy of all current statutory approvals; (b) Management Plans - a copy of the current environmental management strategy and associated plans and programs; (c) Monitoring Results - a summary of the monitoring results for the project; (d) Complaints Register - a complaints register;	**Compliant Ongoing**

Condition No.	Project Approval 08_0149 Condition	Verification	Comments	Compliance
	(e) a copy of the minutes of CCC meetings; (f) a copy of any Annual Reviews (over the last 5 years); (g) a copy of any Independent Environmental Audit, and the Proponent's response to the recommendations in any audit; and (h) any other matter required by the Director-General.		(e) Community Consultation Committee Information - a copy of the minutes of CCC meetings; (f) Environmental Reporting - a copy of Annual Reviews for 2010 to 2014; (g) Environmental Reporting - a copy of the (h) Independent Environmental Audit 2011, and the Proponent's response to the recommendations in any audit.	

Attachment B

Extraction Plan Long-walls 23-27 Approval Conditions

9 April 2014

Condition No.	Extraction Plan Approval Condition	Verification	Comments	Compliance
1	**Definitions**			
2	Subject to the definitions above, the definitions in the conditions of approval MP 08_0149 apply to this approval.			**Noted**
	Terms of Approval			
3	The Proponent shall carry out the development generally in accordance with the: a) conditions of approval MP 08_0149; b) conditions of this approval; and c) Extraction Plan	• Environmental Assessment - Metropolitan Mine Replacement Drift Construction Modification 1 Jul 2010	The Metropolitan Mine has been developed generally in accordance with the Environmental Assessment, Preferred Project Report and Modifications.	**Compliant Ongoing**
4	If there is any inconsistency with the Extraction Plan, then the conditions of this approval shall prevail to the extent of the inconsistency.			**Noted**
	Remediation			
5	The Proponent shall develop a Grouting Protocol and Grouting Procedure for proposed remedial grouting works within Waratah Rivulet and/or other watercourses in consultation with OEH, SCA and DRE and submit those documents to the Director-General for approval by 31 July 2014.	• Rehabilitation Management Plan, May 2014 • Letter to DP&E re Grouting Protocol and Grouting Procedure, 30 Apr 2014 • Letter from DP&E re Approval of Grouting Protocol and Grouting Procedure, 19 Aug 2014	The Rehabilitation Management Plan (including the Grouting Protocol and Grouting Procedure – section 7.2.6) was prepared in consultation with the DRE and SCA and approved by DP&E on 19 August 2014.	**Compliant**
6	Prior to undertaking any remedial grouting works in accordance with the Grouting Protocol and Grouting Procedure the Proponent shall consult with OEH, SCA, DRE and P&I, and shall then implement the works to the satisfaction of the Director-General.	• Letter to DP&E re Grouting Protocol and Grouting Procedure, 30 Apr 2014 • Letter from DP&E re Approval of Grouting Protocol and Grouting Procedure, 19 Aug 2014	The Rehabilitation Management Plan approved Grouting Protocol and Grouting Procedure by the DP&E on 19 August 2014, have been implemented for the remediation works on Waratah Rivulet and	**Compliant ongoing**
7	If the Proponent does not meet the performance measures in condition 1 of Schedule 3 of approval MP 08_0149, then the Director-General may issue the Proponent with a direction in writing to undertake actions or measures to mitigate or remediate subsidence impacts and/or associated environmental consequences. The Proponent must implement the direction in accordance with its terms and requirements, in consultation with the Director-General and affected agencies.			**Not triggered**

Condition No.	Extraction Plan Approval Condition	Verification	Comments	Compliance
	Waratah Rivulet Flow Gauging Station			
8	The Proponent shall ensure that the existing Waratah Rivulet flow gauging station is not subject to subsidence impacts which render it unsuitable for its primary purpose without first constructing, in consultation with SCA, an appropriate alternative flow gauging station further downstream (as close as practicable to the full supply level of Woronora Reservoir) and establishing a flow rating curve over a period of 2 years, to the satisfaction of the Director-General.	• Surface Works Assessment Form for the Waratah Rivulet Replacement Gauging Station, Jan 2015 • Letter to SCA re Waratah Rivulet Replacement Gauging Station, 8 January 2015	Metropolitan Coal has developed a Surface Works Assessment Form for the Waratah Rivulet Replacement Gauging Station, dated January 2015. The Surface Works Assessment Form was submitted to the SCA on 8 January 2015, and is currently under review by SCA.	**Compliant Ongoing**
	Monitoring and Reporting Requirements			
9	The Proponent shall implement a monitoring and reporting procedure that contains the following elements: a) incident reporting, following any occasion of incident, in accordance with the conditions of consent and/or environment protection licence and/or any requirements in the TARP(s); b) bi-monthly subsidence impact reporting, following regular monthly inspections, but only if any new impact is identified. Impact reporting must include a full description, location identification using aerial photos with long-wall layout superimposed, good photos of the impact and preliminary characterisation of the impact in accordance with the relevant TARP(s); c) six-monthly reporting of all impacts and environmental monitoring results, including: ○ a comprehensive summary of all impacts, including a revised characterisation according to the relevant TARP(s); ○ any proposed actions resulting from Triggers being met in the TARP, or other actions; ○ assessment of compliance with all relevant performance measures and indicators; ○ a comprehensive summary of all quantitative and qualitative environmental monitoring results, including landscape monitoring, water quality data, water flow and pool level data, piezometer readings, etc; and d) Annual Review reporting, to be based on each two successive six-monthly reports of impacts and environmental monitoring results. A summary of subsidence effects monitoring results should also be included. *Notes; a The Director-General may agree to a lesser frequency for the bi-monthly and six-monthly reporting set out above, if subsidence impacts and environmental consequences at the mine are relatively rare and benign in character. There is no need to include results of the monitoring of subsidence effects within bi-monthly and six-monthly reports to P&1. However, a summary of subsidence effects monitoring results should be included in the Annual*	• Six Monthly Report 1 Jan to 30 Jun 2014 • Six Monthly Report 1 Jul 2014 to 31 Dec 2014 • 2011 Annual Review • 2012 Annual Review • 2013 Annual Review/AEMR • 2014 Annual Review/AEMR	The Extraction Plan includes monitoring and reporting procedures for the following elements: a) incident reporting, following any occasion of incident, in accordance with the conditions of consent and/or environment protection licence and/or any requirements in the TARP(s); b) bi-monthly subsidence impact reporting, following regular monthly inspections, but only if any new impact is identified. Impact reporting must include a full description, location identification using aerial photos with long-wall layout superimposed, good photos of the impact and preliminary characterisation of the impact in accordance with the relevant TARP(s); c) Metropolitan coal produces six monthly reports. Reports of impacts and environmental monitoring results: • Six Monthly Reports Section 2.2 Monitoring. • Six Monthly Reports Section 2.3 Assessment of Environmental Performance with relevant performance measures and indicators including landscape monitoring, water quality data, water flow and pool level data, piezometer readings. • Six Monthly Reports Section 2.4 TARP Characterisation. d) Annual Review reporting of impacts and environmental monitoring results and a summary of subsidence monitoring results are reported.	**Compliant Ongoing**

Condition No.	Extraction Plan Approval Condition	Verification	Comments	Compliance
	Review. Other regular responses may be required by other agencies for their own purposes, such as response to the Dams Safety Committee and regular reports assessing impacts of mining close lo sensitive built features. DP&I expects to receive copies of reports of these types.			
	Independent Environmental Audit			
	The Applicant shall ensure that the audit team for the Independent Environmental Audit, required under condition 8 of Schedule 7 of approval MP 08_0149, includes suitable experts in the fields of mine subsidence impacts and remediation, upland swamps, stream hydrology and water quality; and carries out a detailed audit of the impacts of mining in Long-walls 20-27.	• Letter from DP&E re Endorsement of Audit Team, 16 Dec 2014	The Independent Environmental Audit endorsed by the DP&E on16 December 2014 included experts in the fields of: • mine subsidence impacts and remediation – Mr Steve Ditton DgS; • upland swamps – Mr James Tomlin AGE and Mr Matthew Richardson Niche Environmental; • stream hydrology and water quality – Dr Steve Perrens Advisian; and carries out a detailed audit of the impacts of mining in Long-walls 20-27.	**Compliant**

Attachment C
Environment Protection Licence No. 767

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
1	**Administrative conditions**			
A1	**What the licence authorises and regulates**			
A1.1	Not applicable.			
A1.2	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition			**Noted**
	Scheduled Activity Mining for coal Coal works **Fee Based Activity Scale** Mining for coal > 500000 - 2000000 T produced Coal works 0 - 2000000 T loaded		Metropolitan Colliery is complaint with the scale of mining and coal produced under the Fee Based Activity.	**Compliant**
A1.3	Not applicable.			
A2	**Premises to which this licence applies**			
A2.1	The licence applies to the following premises:			
	Premises Details Metropolitan Colliery Parkes Street Helensburgh NSW 2508 LOT 1/DP229817, LOTS 342 & 617/DP752033 **Mining Purposes Lease 276, 725 AND 1344**			**Compliant**
A3	**Other activities**			
A3.1	Not applicable.			
A4	**Information supplied to the EPA**			
A4.1	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a reference to: (a) the applications for any licences (including former pollution control approvals) which this licence replaces under the *Protection of the Environment Operations (Savings and Transitional) Regulation 1998*; and		Works and activities carried out by Metropolitan Coal are in accordance with the proposal contained in the licence application.	**Noted**

<table>
<tr><th>EPL Condition No.</th><th>EPL No. 767 Conditions</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Discharges to air and water and applications to land</td><td></td><td></td><td></td></tr>
<tr><td>P1</td><td>Location of monitoring/discharge points and areas</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">P1.1</td><td>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>Air
<table>
<tr><th>EPA ID No.</th><th>Type of Monitoring Point</th><th>Description of Location</th></tr>
<tr><td>1</td><td>Dust Monitoring</td><td>Dust gauge located at 136 The Crescent labelled as "Point DG01" on the map titled "Dust Monitoring Locations" dated 25/06/09 contained in DECC file no. LIC07/2529-02</td></tr>
<tr><td>2</td><td>Dust Monitoring</td><td>Dust Monitoring Dust gauge located at 28 Old Station Road, labelled as "Point 2" on the map titled "Dust Deposition Monitoring Points" dated March 2003</td></tr>
<tr><td>3</td><td>Dust Monitoring</td><td>Dust Monitoring Dust gauge located at the mine entrance, labelled as "Point 3" on the map titled "Dust Deposition Monitoring Points" dated March 2003</td></tr>
<tr><td>4</td><td>Dust Monitoring</td><td>Dust Monitoring Dust gauge located at Helensburgh Golf Course labelled as "Point 4" on the map titled "Dust Deposition Monitoring Points" dated March 2003</td></tr>
<tr><td>5</td><td>Dust Monitoring</td><td>Dust Monitoring Dust gauge located at 83 Parkes Street labelled as "Point 5" on the map titled "EPA Dust Sampling Points" Drawing Number M517A dated 9/11/2006 and contained in DEC file number 280026A22.</td></tr>
</table></td><td>Environmental Protection Licence monitoring Summary to Apr 2015
2014 Annual Review and AEMR/Rehabilitation Report
2013 Annual Review Monitoring 2013 Annual Review Monitoring Summary 12. Air quality
2012 Annual Review Monitoring Summary 12. Air quality</td><td>Dust monitoring is conducted at the 15 dust deposition gauge locations and PM_{10} location identified in EPL condition P1.1.

Dust deposition gauge (DDG6) EPA Identification No. 11, was relocated from 55 Parkes Street to 59 Parkes Street, and included in Variation No. 1526235 from the EPA on 21 November 2014.</td><td>Compliant Ongoing</td></tr>
</table>

<table>
<tr><th>EPL Condition No.</th><th>EPL No. 767 Conditions</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><td>11</td><td>Dust Monitoring</td><td>Dust gauge located at 55 Parkes Street labelled DG6 on "Figure 4 - Location of Air Quality Monitoring Sites" EPA ref. DOC13/32045</td></tr>
<tr><td>12</td><td>Dust Monitoring</td><td>Dust gauge located at 32 Old Station Road labelled DG7 on "Figure 4 - Location of Air Quality Monitoring Sites" EPA ref. DOC13/32045</td></tr>
<tr><td>13</td><td>Dust Monitoring</td><td>Dust gauge located at 88 Parkes Street labelled DG8 on "Figure 4 - Location of Air Quality Monitoring Sites" EPA ref. DOC13/32045</td></tr>
<tr><td>14</td><td>Dust Monitoring</td><td>Dust gauge located at Helensburgh Public School labelled DG9 on "Figure 4 - Location of Air Quality Monitoring Sites" EPA ref. DOC13/32045</td></tr>
<tr><td>15</td><td>Dust Monitoring</td><td>Dust gauge located at Helensburgh Private School labelled DG10 on "Figure 4 - Location of Air Quality Monitoring Sites" EPA ref. DOC13/32045</td></tr>
<tr><td>16</td><td>Ambient Air Monitoring</td><td>PM_{10} monitor located at 12 Robertson Street labelled HVAS1/TEOM1 on "Figure 4 - Location of Air Quality Monitoring Sites" EPA ref. DOC13/32045</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td>P1.2</td><td>The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>P1.3</td><td>The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.</td><td></td><td></td><td>Noted</td></tr>
<tr><td></td><td>Water and land
<table>
<tr><th>EPA ID No.</th><th>Type of Monitoring Point</th><th>Description of Location</th></tr>
<tr><td>6</td><td>Discharge to waters</td><td>The pipe outlet to Camp Creek upstream of the existing weir</td></tr>
</table>
</td><td></td><td>Note: Points 6, 7 and 8 are not active discharge points.

Point 9
The Annual Reviews (Project Approval Schedule 6 condition 3) and EPA Annual Returns EPL 767</td><td>Compliant Ongoing</td></tr>
</table>

EPL Condition No.	EPL No. 767 Conditions			Verification	Comments	Compliance
			wall shown on drawing No. M518 titled "EPA Monitoring Points" dated 10/11/06 and contained in EPA file no. 280026A22.		condition R1) provide water quality results from monitoring undertaken at Point 9 (the clean water tank at the Water Treatment Plant). The monitoring at Point 9 required by condition M2 is conducted to determine compliance with the limits specified for Points 6 & 7 in condition L2.4. **Point 10** Discharge volume is continuously monitored at EPA Point 10 (flow meter on the pipeline discharging from the clean water tank in the water treatment plant). The Annual Reviews provide the total amount of water discharged from the Water Treatment Plant to Camp Gully during the annual reporting period.	
		7	The outlet of the concrete flume (from the water treatment plant) to Camp Creek shown on drawing No. M518 titled "EPA Monitoring Points" dated 10/11/06 and contained in EPA file no. 280026A22			
		8	The overflow from the Turkey Nest Dam to Camp Creek shown on drawing No. M518 titled "EPA Monitoring Points" dated 10/11/06 and contained in EPA file no. 280026A22.			
		9	**Effluent Quality Monitoring**	The clean water tank of the water treatment plant shown on Drawing No. SADA-G-013 titled "Water Clean-up Plant General Arrangement" dated 12/11/2001 and contained in EPA file no. 280026A15		
		10	**Volume Monitoring**	The flowmeter on the pipeline discharging from the clean water tank in the water treatment plant shown on Drawing No. SADA-G-013 titled "Water Clean-up Plant General Arrangement" dated 12/11/2001 and contained in EPA file no. 280026A15		
3	**Limit conditions**					
L1	**Pollution of waters**					
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*.			• *Protection of the Environment Operations Act 1997* section 120	The surface water discharges to Camp Gully comply with the quality criteria in EPL No. 767 condition L2.4	**Compliant Ongoing**
L2	**Concentration limits**					
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					**Noted**

<table>
<tr><th>EPL Condition No.</th><th>EPL No. 767 Conditions</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>applied to that area, must not exceed the concentration limits specified for that pollutant in the table.</td><td></td><td></td><td></td></tr>
<tr><td>L2.2</td><td>Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>L2.3</td><td>To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>L2.4</td><td>Water and/or Land Concentration Limits
POINTS 6,7
<table><tr><th>Pollutant</th><th>Unit of Measure</th><th>100 %ile concentration limit</th></tr><tr><td>Oil and Grease</td><td>mg/L</td><td>10</td></tr><tr><td>pH</td><td>pH units</td><td>6.5-8.5</td></tr><tr><td>Total Suspended Solids</td><td>mg/L</td><td>30</td></tr></table>Note: The monitoring at Point 9 required by condition M2 is conducted by the licensee to determine compliance with the limits specified for Points 6 & 7 in condition L3.3</td><td>• 2014 Annual Review and AEMR/Rehabilitation Report
• 2013 Annual Review Monitoring 2013 Annual Review Monitoring Summary 12. Air quality
• 2012 Annual Review Monitoring Summary</td><td>The Annual Reviews and Annual Returns provide water quality results from monitoring undertaken at Point 9 (the clean water tank at the Water Treatment Plant).
(Note: Point 6 and Point 7 are not active discharge points, and monitoring at Point 9 is conducted to determine compliance with the limits specified for Points 6 & 7).

All monitoring results of discharge water demonstrated compliance with the pH, Oil and Grease or Total Suspended Solids criteria during 2012 and 2015.</td><td>Compliant Ongoing</td></tr>
<tr><td>4</td><td>Operating conditions</td><td></td><td></td><td></td></tr>
<tr><td>O1</td><td>Activities must be carried out in a competent manner</td><td></td><td></td><td></td></tr>
<tr><td>O1.1</td><td>Licensed activities must be carried out in a competent manner. This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.</td><td></td><td>Activities carried out by Metropolitan Coal for the processing, handling, movement and storage of materials and substances used and the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity are conducted in a competent manner.</td><td>Compliant</td></tr>
<tr><td>O2</td><td>Maintenance of plant and equipment</td><td></td><td></td><td></td></tr>
<tr><td>O2.1</td><td>All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.</td><td></td><td>All plant and equipment installed and operated at the premises is maintained and operated in a proper and efficient manner.</td><td>Compliant Ongoing</td></tr>
<tr><td>O3</td><td>Dust</td><td></td><td></td><td></td></tr>
<tr><td>O3.1</td><td>The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.</td><td></td><td>The Metropolitan Coal premises is maintained in a condition that minimises the emission of dust from the premises.</td><td>Compliant Ongoing</td></tr>
<tr><td>5</td><td>Monitoring and recording conditions</td><td></td><td></td><td></td></tr>
<tr><td>M1</td><td>Monitoring records</td><td></td><td></td><td></td></tr>
<tr><td>M1.1</td><td>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.</td><td></td><td></td><td>Noted</td></tr>
</table>

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
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.		All monitoring data and reports are retained by the Environment Section at the Metropolitan Colliery Mine site office, recorded in a legible form and can be produced if requested by an authorised officer.	**Compliant Ongoing**
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.		All monitoring records have the date and time of collection, monitoring location and name of the person who collected the sample. The samples are recorded on a Chain-of-Custody form at the time of collection and delivery to the laboratory.	**Compliant Ongoing**
M2	**Requirement to monitor concentration of pollutants discharged**			
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:	• 2014 Annual Review and AEMR/Rehabilitation Report • 2013 Annual Review Monitoring Summary • 2012 Annual Review Monitoring Summary	The monitoring (by sampling and obtaining results by analysis) for each parameter specified in condition M2.1 is conducted by Metropolitan Coal at a frequency and in accordance with approved methods.	**Compliant Ongoing**

<table>
<tr><th>EPL Condition No.</th><th>EPL No. 767 Conditions</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr>
<td>M2.2</td>
<td>
Air Monitoring Requirements
POINTS 1, 2, 3, 4, 5 and Points 11, 12, 13, 14, 15
<table>
<tr><th>Pollutant</th><th>Unit of Measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Ash</td><td rowspan="3">g/m^2/mth</td><td rowspan="3">Monthly</td><td rowspan="3">AS 3580.10.1-2003</td></tr>
<tr><td>Combustible solids</td></tr>
<tr><td>Insoluble solids</td></tr>
</table>
Point 16
<table>
<tr><th>Pollutant</th><th>Unit of Measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>PM_{10}</td><td>µg/m^3</td><td>Monthly</td><td>AS/NZS 3580.9.6:2003</td></tr>
</table>
</td>
<td>

Environmental Protection Licence Monitoring Summaries to April 2015
2014 Annual Review and AEMR/Rehabilitation Report
2013 Annual Review Monitoring Summary 12. Air quality
2012 Annual Review Monitoring Summary 12. Air quality

</td>
<td>
The HVAS monitoring is performed generally in accordance with the specified standard.
Equipment maintenance and calibration records have been sighted for the HVAS for the following dates:
<table>
<tr><th>HVAS Calibration Report</th><th>Days</th></tr>
<tr><td>20-Feb-12</td><td>53</td></tr>
<tr><td>26-Apr-12</td><td>66</td></tr>
<tr><td>19-Jun-12</td><td>54</td></tr>
<tr><td>22-Aug-12</td><td>64</td></tr>
<tr><td>23-Oct-12</td><td>62</td></tr>
<tr><td>10-Dec-12</td><td>48</td></tr>
<tr><td>26-Feb-13</td><td>78</td></tr>
<tr><td>15-Apr-13</td><td>48</td></tr>
<tr><td>02-Jul-13</td><td>78</td></tr>
<tr><td>12-Sep-13</td><td>72</td></tr>
<tr><td>29-Nov-13</td><td>78</td></tr>
<tr><td>28-Jan-14</td><td>60</td></tr>
<tr><td>18-Mar-14</td><td>49</td></tr>
<tr><td>19-May-14</td><td>61</td></tr>
<tr><td>22-Jul-14</td><td>126</td></tr>
<tr><td>16-Sep-14</td><td>56</td></tr>
<tr><td>14-Nov-14</td><td>59</td></tr>
</table>
</td>
<td>Compliant Ongoing</td>
</tr>
<tr>
<td>M2.3</td>
<td>
Water and/ or Land Monitoring Requirements

Point 9
<table>
<tr><th>Pollutant</th><th>Unit of Measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Oil and Grease</td><td>mg/L</td><td rowspan="3">Monthly during discharge</td><td rowspan="3">Grab sample</td></tr>
<tr><td>pH</td><td>pH units</td></tr>
<tr><td>Total Suspended Solids</td><td>mg/L</td></tr>
</table>
</td>
<td>

Environmental Protection Licence Monitoring Summaries to April 2015
2014 Annual Review and AEMR/Rehabilitation Report
2013 Annual Review Monitoring Summary
2012 Annual Review Monitoring Summary

</td>
<td>
The required pollutants (pH, TSS and Oil and Grease) were monitored at Point 9.

The Annual Reviews state:
“The site water management system continuously monitors total suspended solids and prevents discharges of water that exceeds the criteria. Water that exceeds the criteria is treated further to ensure that only water which meets the acceptable criteria is discharged.”
</td>
<td>Compliant Ongoing</td>
</tr>
</table>

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
M3	**Testing methods - concentration limits**			
M3.1	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: (a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or (b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or (c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. *Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".*	• *Protection of the Environment Operations (Clean Air) Regulation 2002* • *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*	All analysis of samples collected and analysed for parameters stipulated in this condition is conducted in accordance with approved methods.	**Compliant Ongoing**
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.		• Environmental Earth Sciences (contractor for water sampling) employs standard methods that comply with or exceed the minimum requirements in *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales* (DEC, 2004), as detailed in their Soil, Gas and Groundwater and Surface Water Sampling Manual (26 August 2011). All samples collected and analysed are recorded on a Chain of Custody form. • Surface water quality testing is undertaken by Sydney Analytical Laboratories - a NATA Accredited Laboratory. sighted	**Compliant Ongoing**
M4	**Recording of pollution complaints**			
M4.1	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.		A Complaints register is maintained by Metropolitan Colliery and the records retained. A summary of complaints is reported in the Annual Return to the EPA, and also reported in the Annual Reviews.	**Compliant Ongoing**
M4.2	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;	• 2014 Annual Review and AEMR/Rehabilitation Report • 2013 Annual Review Monitoring Summary • 2012 Annual Review Monitoring Summary	The complaints records include details of: (a) date and time of the complaint; (b) method by which the complaint was made; (c) details of the complainant; (d) nature of the complaint; and (e) action taken by Metropolitan Coal in relation to the complaint.	**Compliant Ongoing**

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
	(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			
M4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.		All records of complaints are retained in the Metropolitan Coal Environment files.	**Compliant Ongoing**
M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.			**Noted**
M5	**Telephone complaints line**			
M5.1	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.		Metropolitan Colliery have a dedicated telephone complaints line 1800 115 003 that is displayed on signage at the entrance to mine, and a community information and complaints number 02 4294 7222, at the Community Consultative Centre.	**Compliant Ongoing**
M5.2	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.		The Complaints Line telephone number is available on the Metropolitan Coal Community Environment News and through the Community Consultative Centre Walker Street Helensburgh.	**Compliant Ongoing**
M5.3	Conditions M5.1 and M5.2 do not apply until 3 months after: (a) the date of the issue of this licence or (b) if this licence is a replacement licence within the meaning of the *Protection of the Environment Operations (Savings and Transitional) Regulation 1998*, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.			**Noted**
M6	**Requirement to monitor volume or mass**			
M6.1	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. **POINT 10** **Frequency** | **Unit of Measure** | **Sampling Method** Continuous | kL/day | Magnetic flow meter	• 2011 Annual Return • 2012 Annual Return • 2013 Annual Return	The Annual Reviews state that the monitoring complies with the EPL criteria and provide the total discharge volume to Camp Gully for each reporting period.	**Compliant Ongoing**
6	**Reporting conditions**			
R1	**Annual return documents**			
R1.1	**What documents must an Annual Return contain?** The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: (a) a Statement of Compliance; and (b) a Monitoring and Complaints Summary.	• 2011 Annual Return EPL 767 • 2012 Annual Return EPL 767 • 2013 Annual Return EPL 767 • 2014 Annual Return EPL 767	The Annual Returns are prepared on the approved form: (a) Statement of Compliance in included signed by a Metropolitan Coal Director and Company Secretary;	**Compliant Ongoing**

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
	A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA.		(b) The Monitoring and Complaints Summary are included in each Annual Return.	
R1.2	**Period covered by Annual Return** An Annual Return must be prepared in respect of each reporting period, except as provided below. *Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period*.	• 2012 Annual Return EPL 767 • 2013 Annual Return EPL 767 • 2014 Annual Return EPL 767	Reporting period for the Metropolitan Coal Annual Returns is 1 January to 31 December each year.	**Compliant Ongoing**
R1.3	Where this licence is transferred from the licensee to a new licensee: (a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and (b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period. *Note: An application to transfer a licence must be made in the approved form for this purpose*.			**Noted**
R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: (a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or (b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.			**Noted**
R1.5	**Deadline for Annual Return** The Annual Return for the reporting period must be supplied to the EPA 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').	• 2012 Annual Return EPL 767 • 2013 Annual Return EPL 767 • 2014 Annual Return EPL 767	The Annual Returns for Metropolitan Colliery have been submitted within 60 days of the end of the reporting period.	**Compliant Ongoing**
R1.6	**Licensee must retain copy of Annual Return** 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.	• 2012 Annual Return EPL 767 • 2013 Annual Return EPL 767 • 2014 Annual Return EPL 767	Copies of the Annual Returns are retained in the Environment Section files.	**Compliant**
R1.7	**Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary** Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: (a) the licence holder; or	• 2012 Annual Return EPL 767 • 2013 Annual Return EPL 767 • 2014 Annual Return EPL 767	The Annual Returns are prepared on the approved forms and the Statement of Compliance is signed by a Metropolitan Coal Director and Company Secretary.	**Compliant**

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
	(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.			
R1.8	A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.	• 2012 Annual Return EPL 767 • 2013 Annual Return EPL 767 • 2014 Annual Return EPL 767		**Noted**
R2	**Notification of environmental harm**			
	Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.			
R2.1	Notifications must be made by telephoning the Environment Line service on 131 555.		No reportable incidents requiring notification occurred between August 2012 and May 2015.	**Not triggered**
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.		Incident Report submitted to OEH on 22 August 2011 re water run-off from a Virgin Excavated Natural Material stockpile in the drift construction area at the Colliery drained via an on-site clean water drain to Helensburgh Creek Culvert and subsequently into Camp Creek.	**Compliant**
R3	**Written report**			
R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: (a) where this licence applies to premises, an event has occurred at the premises; or (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.		No reportable incidents requiring notification or requests by the EPA for written reports on suspected incidents occurred between September 2011 and May 2015.	**Not triggered**
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.			**Not triggered**
R3.3	The request may require a report which includes any or all of the following information: (a) the cause, time and duration of the event; (b) the type, volume and concentration of every pollutant discharged as a result of the event; (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; (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;			**Not triggered**

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
	(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; (f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and (g) any other relevant matters.			
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.			**Not triggered**
	General conditions			
G1	**Copy of licence kept at the premises**			
G1.1	A copy of this licence must be kept at the premises to which the licence applies.		Copies of the EPL are kept in the Environment Office at the Metropolitan Colliery Mine site.	**Compliant**
G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.			**Noted**
G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.		The EPL is kept in the Environment Office at the Metropolitan Colliery Mine site and is available for inspection at any time.	**Noted**
G2	**Other general conditions**			
G2.1	**Completed Pollution Studies and Reduction Programs (PRPs)**			

PRP	Description	Completed Date
PRP1: Wastewater Collection and Treatment System	Collection and Treatment System Wastewater collection and treatment system installed to collect and treat contaminated surface stormwater runoff from the coal and coal waste stockpile area catchments	30 June 1997
PRP2: Turkeys Nest Pond and Pumping System Upgrade	Turkeys Nest Pond and Pumping System upgrade to ensure no discharge of contaminated runoff into Camp Creek.	31 October 2000
PRP3: Settlement Pond Upgrade	Settlement Pond upgrade to enhance the collection and treatment of contaminated stormwater from the upper catchment of the premises	31 December 2000
PRP4: Taj Mahal Upgrade	Taj Mahal upgrade to facilitate the use of stormwater for operational purposes and to provide a means of underground disposal of excess contaminated stormwater from significant rainfall events	31 January 2001
PRP5: Dust Monitoring Program	Install dust deposition monitoring network. Assess the impact of dust from coal mine on local community	31 March 2003
PRP6: Surface Dust Action Plan	Complete a surface dust action plan. Minimise the impact of dust from coal mine	30 June 2003
PRP7: Surface Water Assessment	Prepare a surface water management plan including surveys of all water containment structures and determine storm event (24hr) that site can capture	31 August 2004

The PRP table attached to the EPL lists the completed programs and a short description of the requirements of the PRP requirement.

Noted

EPL Condition No.	EPL No. 767 Conditions	Verification	Comments	Compliance
	and treat. Protect Hacking River Catchment and make licence more enforceable by determining capacity of site to capture and treat stormwater runoff.			
PRP8: Improvement to Dust Suppression Systems	Prepare and submit a report investigating installation of additional stockpile sprays. Installation of sprays to reduce impact of dust on community	31 August 2004		
PRP9: Noise Assessment Report	Assess noise from the premises in accordance with INP and determine if they meet requirements of the policy. Eliminate public concern caused by machinery operations at night and prepare noise limits for licence	31 October 2004		
PRP10: Improvements to Rail Line Dust Suppression	Install six additional dust suppression sprays along the rail line near the stockpile. Reduce dust emissions from the stockpile and during rail loading operations	31 December 2005		
PRP11: Noise Emission Reduction Program	Noise Emission Reduction Program Report. Investigate measures to reduce noise emissions from the premises with the aim of meeting the noise criteria outlined.(+)	30 April 2006		
PRP12: Stage 2 Noise Investigation and Mitigation	Stage 2 Noise Investigation and Mitigation Program. Identify reasonable and feasible noise controls and management measures for the premises.(+)	31 March 2008		
PRP13: Coal Mine Particulate Matter Control Best Practice	Requires licensee to conduct a site specific Best Management Practice (BMP) determination to identify ways to reduce particle emissions	21 September 2012		

Attachment D Consolidated Coal Lease 703

INSTRUMENT OF RENEWAL

LEASE NO. Consolidated Coal Lease No. 703
HOLDER: Metropolitan Collieries
DATE OF LEASE: 3 July 1989 EXPIRY DATE OF LEASE: 26 January 2003
PERIOD OF RENEWAL UNTIL: 26 January 2024
AREA: about 51.95 square kilometres
MINERAL: Coal

AMENDMENTS TO THE CONDITIONS OF THE LEASE:
All the Conditions contained in the lease prior to the renewal have been deleted.
The lease is now subject to the attached Schedule of Conditions of Authority (Coal) (1999):

ML No.	ML Condition		Comment	Compliance
	SCHEDULE OF CONDITIONS OF AUTHORITY (COAL) (1999) EXTRACTION OF COAL			
1	The lease holder shall extract as large a percentage of the coal in the subject area as is practicable consistent with the provisions of the Coal Mines Regulations Act 1982 and the Regulations thereunder and shall comply with any direction given or which may be given in this regard by the Minister.			**Noted**
	MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP) MINING OPERATIONS PLAN (MOP)			
2	(1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:- • ongoing mining operations and environmental management; and • ongoing monitoring of the project. (2) The Plan must be prepared in accordance with the Director-General's guidelines, current at the time of lodgement. (3) A Plan must be lodged with the Director-General : • prior to the commencement of operations; • subsequently as appropriate prior to the expiry of any current Plan; and • in accordance with any direction issued by the Director-General.	• Mining Operations Plan, 2000 • Mining Operations Plan 1 Oct 2005 to 30 Sep 2012, dated 31 Aug 2005 • Letter from DPI re Approval of MOP 1 Oct 2005 to 30 Sep 2012, 14 Sep 2005 • Draft Final Closure Plan, Oct 2005 • Letter from DPI re Draft Final Closure Plan – Addendum to MOP, 24 Oct 2005 • Letter from DI&I re Approval of MOP Amendment, 20 May 2010 • Mining Operations Plan (October 2005- September 2012),	The Mining Operations Plan 2005 to 2012 was approved by DPI Minerals and amendment of the MOP occurred in 2010 and was approved by DI&I on 14 September 2005. (1) Environmental management of the mine operations occurs in accordance with the MOP, Project Approval conditions and Environment Protection Licence conditions and monitoring programs. (2) The MOP was prepared to satisfy the Director-General's Guidelines current in 2005. (3) The MOP was lodged with the D-G prior to operations of the Metropolitan Colliery operations for the 1 October to 30 September 2012 period. (4) Section 3 of the MOP presented Proposed Mining Activities for the 2005 to 2012 period:	**Compliant**

ML No.	ML Condition		Comment	Compliance
	(4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:- • area(s) proposed to be disturbed under the Plan; • mining and rehabilitation method(s) to be used and their sequence; • areas to be used for disposal of tailings/waste; • existing and proposed surface infrastructure; • progressive rehabilitation schedules; • areas of particular environmental sensitivity; • water management systems (including erosion and sediment controls); • proposed resource recovery; and • where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation The Plan when lodged will be reviewed by the Department of Mineral Resources. The Director-General may within two (2) months of the lodgement of a Plan, require modification and re-lodgement. If a requirement in accordance with clause (6) is not issued within two months of the lodgement of a Plan, lease holder may proceed with implementation of the Plan submitted subject to the lodgement of the required security deposit within the specified time. During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) - (7) above.	• Letter from DRE re Acceptance of MOP (October 2005-September 2012), 20 May 2010 • Mining Operations Plan (October 2012- September 2019), • Letter from DRE re Acceptance of the MOP (October 2012-September 2019, 10 Jan 2013	• plans of areas proposed to be disturbed during the period of the MOP (Plans 4A, 4B and 4C); • Section 4 Proposed Rehabilitation Activities during MOP Term; • Section 2.1.1 Main Pit Top, 2.1.2 No.3 Ventilation Shaft, and 2.1.3 Current Mining Area, and Figure 5A Surface Layout; • Section 6 Environmental and Rehabilitation Risk Identification; • Section 3.6 Water Management; • Section 3 Proposed Mining Activities Addendum requested by D-G for a Final Closure Plan for Metropolitan Colliery as an Addendum to the MOP. The draft Final Closure Plan was accepted as satisfactory by the DPI on 24 October 2005. An Amendment to the MOP was prepared and submitted to the DI&I on 8 May 2010 and approved by DI&I on 20 May 2010. (Water management system is detailed in Section 3.8, Water Management Table 6.1, Environmental Risk Identification Matrix and Section 6.2, Erosion/ Sediment Minimisation). The current MOP for October 2012 to September 2019 was prepared and submitted to the DRE for approval.	
	ANNUAL ENVIRONMENTAL MANAGEMENT REPORT (AEMR)			
3	(1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General. (2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:- • the accepted Mining Operations Plan; • development consent requirements and conditions; • Environment Protection Authority and Department of Land and Water Conservation licences and approvals;	Guidelines and Format for Preparation of an Annual Environmental Management Report - Version 3, Jan 2006	The Annual Environmental Management Reports have been prepared for the period 1 January to 31 December each year and submitted annually to the Director-General. The AEMR's were prepared in accordance with the *Guidelines and Format for Preparation of an Annual Environmental Management Report*.	**Compliant Ongoing**

ML No.	ML Condition		Comment	Compliance
	• any other statutory environmental requirements; • details of any variations to environmental approvals applicable to the lease area. and • where relevant, progress towards final rehabilitation objectives. (3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice. (4) The lease holder shall, as and when directed by the Minister, co-operate with the Director-General to conduct and facilitate review of the AEMR involving other government agencies.			
	BARRIERS			
9	The lease holder shall not work or cause to be worked any seam of coal within the subject area without leaving, if the Minister, so directs, a barrier of such width or .a protective pillar or pillars of such size or sizes against any surface improvements of any feature whether natural or artificial.	• MOP (October 2005-September 2012) • MOP (October 2012-September 2019)		**Noted**
22	Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.	• MOP (October 2005-September 2012) • MOP (October 2012-September 2019)		**Noted**
23	If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.	• MOP (October 2005-September 2012) Section 3.1 • MOP (October 2012-September 2019)		**Noted**
24	The lease holder shall take all precautions against causing outbreak of fire on the subject area.			**Noted**
25	The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent contamination, pollution, erosion or sedimentation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment and shall observe any instruction given or which may be given by the Minister with a view to	• Extraction Plan and sub-plans, April 2014 • MOP (October 2005-September 2012) • MOP (October 2012-September 2019)	Metropolitan Coal provides and maintains effective means to prevent contamination, pollution, erosion or sedimentation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area in accordance with the Extraction Plan Water Management Plans that include:	**Compliant Ongoing**

ML No.	ML Condition		Comment	Compliance
	preventing or minimising the contamination, pollution, erosion or sedimentation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area or any undue interference to fish or their environment.		• Stream bank erosion mitigation measures are detailed in Extraction Plan Water Management Plans for LW20-22 and LW23-27, section 8.2.2. • Erosion and sediment management is addressed in the Construction Management Plan, section 6.3; • Erosion control at the Major Surface Facilities Area and Ventilation Shafts is addressed in Surface Facilities Water Management Plan section 8.2; • Containment and isolation measures for potential contaminants on site in Surface Facilities Water Management Plan section 8.3; and • Project Approval Schedule 3 conditions 1 to 6.	
	TREES (PLANTING AND PROTECTION OF) FLORA AND FAUNA AND ARBOREAL SCREENS			
27	If so directed by the Minister, the lease holder shall ensure that operations are carried out in such manner so as to minimise disturbance to flora and fauna within the subject area.	Biodiversity Management Plan, April 2010	The Metropolitan Coal surface facilities areas are maintained within the historic footprint with no additional clearance of flora or disturbance of fauna having occurred between 2011 and 2015.	**Compliant**
29	The lease holder shall maintain an arboreal screen to the satisfaction of the Minister within such parts of the subject area as may be specified by the Minister and shall plant such trees or shrubs as may be required by the Minister to preserve the arboreal screen in a condition satisfactory to the Minister.		The Metropolitan Colliery surface facilities are within an area that is screened from community view (and residents) with natural vegetation and the local topography. Metropolitan Coal have conducted planting of native species in areas along the entrance and access road to increase screening and manage soil stability.	**Compliant**
	SOIL EROSION			
30	The lease holder shall conduct operations in such a manner as not to cause or aggravate soil erosion and the lease holder shall observe and perform any instructions given or which may be given by the Minister with a view to minimising or preventing soil erosion.	Surface Facilities Water Management Plan – section 8.2, Erosion Control	Erosion control is covered in the Surface Facilities Water Management Plan section 8 Management Measures, and section 8.2 Erosion Control. .	**Compliant**
	ROADS			

ML No.	ML Condition		Comment	Compliance
31	The lease holder shall pay to Wollongong City Council, Department of Land and Water Conservation or the Chief Executive, Roads and Traffic Authority the cost incurred by such Council or Department or Chief Executive of making good any damage caused by operations carried on by or under the authority of the lease holder to any road adjoining or traversing the surface or the excepted surface, as the case may be of the subject area. PROVIDED HOWEVER that the amount to be paid by the lease holder as aforesaid shall be reduced by such sum of money if any as may be paid to the said Council the Department of Land and Water Conservation or the Chief Executive, Roads and Traffic Authority as the case may be from the Mine Subsidence Compensation Fund constituted under the Mine Subsidence Compensation Act, 1961, in settlement of a claim for compensation for the same damage.	• Metropolitan Coal Traffic Management Plan, March 2011 • Project Approval Schedule 4 condition 18 and 19 • Regulatory Requirement Council Contributions, 7 Oct 2011 • Annual Contributions: ○ Wollongong City Council 8 Sep 2011 ○ Wollondilly Shire Council, 5 Sep 2011 ○ Campbelltown City Council, 4 Oct 2011 ○ Wollongong City Council, 30 Nov 2013 ○ Wollondilly Shire Council, 30 Nov 20131 ○ Campbelltown City Council Tax Invoice No. 43408, 30 Nov 2013 ○ Wollongong City Council, 30 Nov 2013 ○ Wollondilly Shire Council, 30 Nov 2013	Contributions have been paid to the WCC ($55,000) on Invoice 404487601980163 dated 8 September 2011. Contribution to Wollondilly Shire Council ($27,500) for road maintenance paid on Invoice No. 14288 dated 5 September 2011. Contribution to Campbelltown City Council ($27,500) for road maintenance paid on Tax Invoice No. 43408 on 5 Oct 2011. Contributions were made to Wollongong City Council, Campbelltown City Council and Wollondilly Shire Council by 30 November 2012. Contributions were made to Wollongong City Council and Wollondilly Shire Council by 30 November 2013	**Compliant**
32	In the event of operations being conducted on the surface of any road, track or fire trail traversing the subject area or in the event of such operations causing damage to or interference with any such road, track or firetrail the lease holder, at his own expense, shall if directed to do so by the Minister provide to the satisfaction of the Minister an alternate road, track or firetrail in a position as required by the Minister and shall allow free and uninterrupted access along such alternate road, track or firetrail and, if required to do so by the Minister, the lease holder shall upon completion of operations rehabilitate the surface of the original road, track or firetrail to a condition satisfactory to the Minister.	• Traffic Management Plan, March 2011 • Extraction Plans – Long-walls 20-22 and 23-27	Metropolitan Coal activities and any subsidence impact on any road, track or fire trail traversing the mine underground areas is addressed by Metropolitan Coal to maintain uninterrupted access within the Woronora Special Area.	**Compliant Ongoing**
	CATCHMENT AREA			
34	(a) The lease holder shall carry out operations within the Woronora Special Area in such a way as to conform strictly to all provisions of the Sydney Water Catchment Management Act, 1998 and the regulations made and currently in force under that Act so that: (i) no catchment infrastructure works and buildings owned by or vested in the Sydney Catchment Authority [SCA], or the stored waters, are wilfully,	• Catchment Monitoring Program, April 2010 • Extraction Plan LW20-22 Water Management Plan, Section 3.3 • Extraction Plan LW23-27 Water Management Plan, Section 3.3 • MOP (October 2005-September 2012) Section 3.1	(a) The Extraction Plan Water Management Plans state that "*Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act", including the Sydney Water Catchment Management Act, 1998"* • The Extraction Plan - Water Management Plans identify management and mitigation measures to	**Compliant Ongoing**

ML No.	ML Condition		Comment	Compliance
	accidentally or negligently destroyed, damaged or interfered with; (ii) the Woronora Special Area is not polluted by operations of the lease holder; (iii) the purity of the stored waters within the Woronora. Dam are preserved; (iv) any requirements notified by the SCA to the lease holder, made in accordance with the provisions of the Sydney Water Catchment Management Act, 1998 and the regulations made thereunder, are complied with. (b)If the lease holder shall at all .times and at the first available opportunity notify the SCA of its current use or its intended use of any process which is likely to pollute the Woronora Special Area, the stored waters of the Woronora Dam or cause damage to the catchment infrastructure works, buildings and stored waters owned by the SCA situated on the Special Area. (c)The SCA shall within five (5) working days following the receipt of the lease holder's notification as referred to in Condition 34 (b), inform the lease holder and the Minister of its opinion of the likely impact of the process to pollute the Woronora Special Area and stored waters and to cause damage to the catchment infrastructure works, buildings and stored waters owned by the SCA. (d)The lease holder, upon service of a notice under the hand of the Minister to do so shall: (i) immediately discontinue the use of such process (and in all cases within twenty four (24) hours); or (ii) thereafter refrain from adopting such process at any time, as the case may require. (e) The lease holder shall undertake environmental assessment for all surface works (including exploration, drilling, clearing of vegetation, and construction of access tracks) within the Woronora Special Area. The assessments are to be to the satisfaction of the SCA. (f) The lease holder is to obtain the permission of the SCA to enter the Woronora Special Area. (g) The lease holder shall provide and maintain to the satisfaction of the Minister efficient means to prevent the contamination, pollution, erosion or sedimentation of any stream or watercourse or Special Area and shall observe any instruction given or which may be given by the Minister with a view to preventing or minimising the contamination, pollution or sedimentation of any stream watercourse or Special Area.	• MOP (October 2012-September 2019) Section 2.2.1, Section 3.2.3	ensure no surface water pollution; and the Mining Operations Plan (October 2005- September 2012) Section 3.1and Mining Operations Plan (October 2012- September 2019) Section 2.2.1, and Section 3.2.3 address operations and/or works in the Woronora Special Area. (b) MOP (2012-2019), p 31 "*Surface works in the Woronora Special Area are conducted in consultation with the SCA*." (c) MOP (2012-2019) states "*As the requirement for surface construction works arise, Metropolitan Coal will provide the specific details of the proposed surface construction works (in the form of a completed Surface Works Assessment Form [Appendix 1 of the Construction Management Plan]) to the DP&I and SCA for comment*." MOP (2012-2019), p 67: "*Metropolitan Coal will consult with the SCA and DTIRIS - Minerals and Energy Division prior to the conduct of any active revegetation in the Woronora Special Area*." (c) SCA action. (d) Under the *Protection of the Environment Operations Act*, 1997 (POEO Act), (Clause 101 – Prohibition on activities) the Minister may direct the cessation of an activity causing harm/ likely to cause harm to the environment. Metropolitan Coal Mine is to take all available steps to cause the activity to cease. (e) The EP WMPs state that "*Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act*", including the POEO Act, 1998 (LW20-22 WMP, Section 3.3, p 9; LW23-27 WMP, Section 3.3, p 10). (f) Metropolitan Coal has had several different access agreements with SCA. SCA has now been amalgamated with Water NSW, and a revised agreement is being developed between Metropolitan Mine and Water NSW. A draft Special Areas Mining Consent has been sighted. Condition 1.1.1 states "*In accordance with the provisions of Division 1 of Part 3 of the Water NSW Regulation 2013, Water NSW grants to the Consent Holder consent to enter and remain on the Designated Area for the purpose of under*	

ML No.	ML Condition		Comment	Compliance
			taking the Permitted Activity in accordance with the conditions of this Consent." (g) The Extraction Plan and sub-plans provide a detailed management system for the protection of the Woronora Special Area during any works conducted by Metropolitan Coal.	
	TRANSMISSION LINES, COMMUNICATION LINES AND PIPELINES			
41	The lease holder shall as far as is practicable so conduct operations as not to interfere with or impair the stability or efficiency of any transmission line, communication line or pipeline traversing the surface or the excepted surface of the subject area and shall comply with any direction given or which may be given by the Minister in this regard.	• Built Features Management Plans	Management Plans for infrastructure/built features have been prepared for each service and have been prepared for prepared for Transgrid Integral Energy/Nextgen/Optus/RailCorp/RTA/Sydney Water/ Telstra/ and Wollongong City Council.	**Compliant Ongoing**
	ABORIGINAL PLACE OR ABORIGINAL OBJECT			
43	The lease holder shall not knowingly destroy, deface or damage any Aboriginal object or Aboriginal place within the subject area except in accordance with an authority issued under the National Parks and Wildlife Act, 1974, and shall take every precaution in drilling, excavating or disturbing the land against any such destruction, defacement or damage.	• Heritage Management Plan, Apr 2010	The Heritage Management Plan provides management, remediation and mitigation measures related to Aboriginal objects and places in the Metropolitan Mine area.	**Compliant Ongoing**
	SUBSIDENCE MANAGEMENT			
61	(a) The leaseholder shall prepare a Subsidence Management Plan prior to commencing any underground mining operations which will potentially lead to subsidence of the land surface. (b) Underground mining operations which will potentially lead to subsidence include secondary extraction panels such as long walls or mini walls, associated first workings (gate roads, installation roads and associated main headings, etc), and pillar extractions, and are otherwise defined by the Guideline for Applications for Subsidence Management Approvals. (c) The leaseholder must not commence or undertake underground mining operations that will potentially lead to subsidence other than in accordance with a Subsidence Management Plan approved by the Director-General, an approval under the Coal Mines Regulation Act 1982, or the document Transitional Provisions for the New Subsidence Management Plan Approval Process. (d) Subsidence Management Plans are to be prepared in accordance with the Guideline for Applications for Subsidence Management Approvals.	• *Guideline for Applications for Subsidence Management Approvals* • Subsidence Management Plan Long-walls 20-22,	(a) Subsidence Management Plans have been developed and approved for Long-walls 20-22. (b) All underground mining operations that could potentially lead to subsidence are included in the Subsidence Management Plan. (c) The Subsidence Management Plans were prepared and approved prior to commencement of underground mining operations in long-walls 20-22. (d) The Subsidence Management Plan for Long-wall 20-22 was prepared in accordance with the *Guideline for Applications for Subsidence Management Approvals* and the approved Subsidence Management Plan forms part of the MOP and is reported in the AEMR. Subsidence management and monitoring is part of the Extraction Plan described in Project Approval 08_0149 Schedule 3 condition 6.	**Compliant Ongoing**

Attachment E
Mining Lease 1610

7 May 2014

INSTRUMENT OF RENEWAL

LEASE NO. Mining Lease No. 1610
HOLDER: Metropolitan Collieries Pty Ltd
DATE OF LEASE: 12 February 2009 EXPIRY DATE OF LEASE: 26 February 2011
PERIOD OF RENEWAL UNTIL: 18 December 2031
AREA: 543.3 ha
MINERAL: Coal

ML No.	ML Condition		Comment	Compliance
	SCHEDULE OF CONDITIONS OF AUTHORITY (COAL) (1999) EXTRACTION OF COAL			
	Rehabilitation			
2	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.			**Noted**
	MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP) MINING OPERATIONS PLAN (MOP)			
3	(a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting, (b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which: (i) identifies areas that will be disturbed; (ii) details the staging of specific mining operations, mining purposes and prospecting; (iii) identifies how the mine will be managed and rehabilitated to achieve the post mining land use; (iv) identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and	• Letter from DI&I re Approval of MOP Amendment, 20 May 2010 • Mining Operations Plan (October 2005- September 2012), • Letter from DRE re Acceptance of MOP (October 2005-September 2012), 20 May 2010 • Mining Operations Plan (October 2012- September 2019) • Mining Operations Plan (MOP) Guidelines Sep 2013 • Letter from DRE re Acceptance of the MOP (October 2012-September 2019, 10 Jan 2013 • Annual Review/AEMR/ Rehabilitation Report 2013 • Annual Review/AEMR/ Rehabilitation Report 2014	The current Mining Operations Plan 2005 to 2012 was approved by DPI Minerals and amendment of the MOP occurred in 2010 and was approved by DI&I. Environmental management of the mine operations occurs in accordance with the MOP, Project Approval conditions and Environment Protection Licence conditions and monitoring programs. (a) The MOP was prepared by Olsen Environmental Consulting to satisfy the Director-General's Guidelines current in 2005. The MOP was lodged with the D-G to address the operations of the Metropolitan Colliery operations for the 1 October 2005 to 30 September 2012 period. (b) Section 3 of the MOP presented Proposed Mining Activities for the 2005 to 2012 period: • plans of areas proposed to be disturbed during the period of the MOP (Plans 4A, 4B and 4C); • Section 4 Proposed Rehabilitation Activities during MOP Term;	**Compliant**

ML No.	ML Condition		Comment	Compliance
	(v) reflects the conditions Of approval under: (vi) the *Environmental Planning and Assessment Act 1979*; (vii) the *Protection of the Environment Operations Act 1997*; and (viii) any other approvals relevant to the development including the conditions of this mining lease. (c) The MOP must be prepared in accordance with the ESG3: Mining Operations Plan (MOP) Guidelines September 2013 published on the Department's website at www.mresources.nsw.gov.au/environment (d) The lease holder may apply to the Minister to amend an approved MOP at any time. (e) It is not a breach of this condition if: (i) the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the Environmental Planning and Assessment Act 1979, the Protection of the Environment Operations Act 1997, the Mine Health and Safety Act 2004 / Coal Mine Health and Safety Act 2002 and Mine Health and Safety Regulation 2007 / Coal Mine Health and Safety Regulation 2006 or the Work Health and Safety Act 2011; and (ii) the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out. (f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: (i) provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP; (ii) be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and (iii) be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resources.nsw.gov.au/environment. (iv) *Note: The Rehabilitation Report replaces the Annual Environmental Management Report.*		• Section 2.1.1 Main Pit Top, 2.1.2 No.3 Ventilation Shaft, and 2.1.3 Current Mining Area, and Figure 5A Surface Layout; • Section 6 Environmental and Rehabilitation Risk Identification; • Section 3.6 Water Management; • Section 3 Proposed Mining Activities The 2005-2012 MOP was approved by DPI on 14 September 2005. Addendum to the MOP was requested by D-G for a Final Closure Plan for Metropolitan Colliery. The draft Final Closure Plan was accepted as satisfactory by the DPI on 24 October 2005. An Amendment to the MOP was prepared and submitted to the DI&I on 8 May 2010 and approved by DI&I on 20 May 2010. Water management system is detailed in Section 3.8, Water Management Table 6.1, Environmental Risk Identification Matrix and Section 6.2, Erosion/ Sediment Minimisation. Rehabilitation reporting occurs annually in the Annual Review/AEMR/Rehabilitation Report prepare for Metropolitan Coal.	

ML No.	ML Condition		Comment	Compliance
4	**Compliance Report**			
	(a) The lease holder must submit a Compliance Report to the satisfaction of the Minister. The report must be prepared in accordance with any relevant guidelines or requirements published by the Minister for compliance reporting. (b) The Compliance Report must include: (i) the extent to which the conditions of this mining lease or any provisions of the Act or the regulations applicable to activities under this mining lease, have or have not been complied with; (ii) particulars of any non-compliance with any such conditions or provisions, (iii) the reasons for any such non-compliance; (iv) any action taken, or to be taken, to prevent any recurrence, or to mitigate the effects, of that non-compliance. The Compliance Report must be lodged with the Department annually on the grant anniversary date for the life of this mining lease. In addition to annual lodgement under condition 4(c) above, a Compliance Report: (i) must accompany any application to renew this mining lease under the Act; (ii) must accompany any application to transfer this mining lease under the Act; and (iii) must accompany any application to cancel, or to partially cancel, this mining lease under the Act. (e) Despite the submission of any Compliance Report under (c) or (d) above, the titleholder must lodge a Compliance Report with the Department at any date or dates otherwise required by the Minister. (f) A Compliance Report must be submitted one month prior to the expiry of this mining lease where the licence holder is not seeking to renew or cancel this mining lease.			**Compliant** **Noted**
5	**Environmental Incident Report**			
	(a) The lease holder must notify the Department of all: (i) breaches of the conditions of this mining lease or breaches of the Act causing or threatening material harm to the environment; and (ii) breaches of environmental protection legislation causing or threatening material harm to the environment (as defined in the Protection of the Environment Administration Act 1991), arising in connection with significant surface disturbing		An Environmental Incident Report would be prepared to satisfy this condition in the event of a reportable incident that would result in environmental harm.	**Not triggered**

ML No.	ML Condition		Comment	Compliance
	activities, including mining operations, mining purposes and prospecting operations, under this mining lease. The notification must be given immediately after the lease holder becomes aware of the breach. (b) The lease holder must submit an Environmental Incident Report to the Department within seven (7) days of all breaches referred to in condition 5(a)(i) and (ii). The Environmental Incident Report must include: (i) the details of the mining lease; (ii) contact details for the lease holder; (iii) a map identifying the location of the incident and where material harm to the environment has or is likely to occur (iv) a description of the nature of the incident or breach, likely causes and consequences; (v) a timetable showing actions taken or planned to address the incident and to prevent future incidents or breaches referred to in 5(a). (vi) a summary of all previous incidents or breaches which have occurred in the previous 12 months relating to significant surface .disturbing activities, including mining operations, mining purposes and prospecting operations under this mining lease. (c) In addition to the requirements set out in conditions 5(a) and (b), the lease holder must immediately advise the Department of any notification made under section 148 of the Protection of the Environment Operations Act 1997 arising in connection with significant surface disturbing activities including mining operations, mining purposes and prospecting operations, under this mining lease.			
6	**Subsidence Management**			
	The lease holder must not commence or undertake underground mining operations that may cause subsidence of the surface other than in accordance with an Eligible Subsidence Management Plan approved by the Director-General. For the purposes of this condition, an 'Eligible Subsidence Management Plan' means: (i) A Subsidence Management Plan prepared in accordance with current government guidelines for the preparation of Subsidence Management Plans; or (ii) Those parts of an Extraction Plan or another type of plan:	• Extraction Plan and sub-plans, April 2014 • MOP (October 2005-September 2012) • MOP (October 2012-September 2019)	Extraction Plans and sub-plans have been prepared and approved for Long-walls 20-22 and Long-walls 23-27 prior to commencement of the underground mining. The Extraction Plans included Subsidence Monitoring Programs. Metropolitan Coal Extraction Plans provide effective means to prevent contamination, pollution, erosion or sedimentation of any river, stream, creek, tributary, lake, dam, reservoir, watercourse or catchment area in accordance with the Extraction Plan - Management Sub-PlansPlans that include: • Stream bank erosion mitigation measures are detailed in Extraction Plan Water Management Plans for LW20-22 and LW23-27, section 8.2.2.	**Compliant Ongoing**

ML No.	ML Condition		Comment	Compliance
	• prepared, either in whole or in part, with reference to current government guidelines for the preparation of a Subsidence Management Plan; and • approved for the purposes of the Environmental Planning and Assessment Act 1979 (or any planning legislation which replaces that Act) by the Minister or Director-General of the Department of Planning & Infrastructure, or another officer of that Department authorised to approve such a plan, which relate to issues of subsidence		• Erosion and sediment management is addressed in the Construction Management Plan, section 6.3; • Erosion control at the Major Surface Facilities Area and Ventilation Shafts is addressed in Surface Facilities Water Management Plan section 8.2; • Containment and isolation measures for potential contaminants on site in Surface Facilities Water Management Plan section 8.3; and • Project Approval Schedule 3 conditions 1 to 6.	