# Austar Coal Mine Annual Review

## July 2018 – June 2019

## ANNUAL REVIEW 2019

| | |
|---|---|
| **Name of operation** | Austar Coal Mine |
| **Name of operator** | Yancoal Mining Services Pty Ltd |
| **Development consent / project approval #** | DA 29/95 and PA 08_0111 |
| **Name of holder of development consent / project** | Austar Coal Mine Pty Ltd |
| **Mining lease #** | Refer Table 3-2 |
| **Name of holder of mining lease** | Austar Coal Mine Pty Ltd |
| **Water licence #** | Refer Table 7-1 |
| **Name of holder of water licence** | Austar Coal Mine Pty Ltd |
| **MOP start date** | 9 Sep 2016 |
| **MOP end date** | 1 Jun 2023 |
| **Annual Review start date** | 1 July 2018 |
| **Annual Review end date** | 30 June 2019 |

**I, Brian Wesley, certify that this audit report is a true and accurate record of the compliance status of Austar Coal Mine for the period 1 July 2018 to 30 June 2019 and that I am authorised to make this statement on behalf of Austar Coal Mine Pty Ltd.**

*Note.*

a) *The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.*

b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).*

| | |
|---|---|
| **Name of authorised reporting officer** | Brian Wesley |
| **Title of authorised reporting officer** | Operations Manager |
| **Signature of authorised reporting officer** | Brian Wesley |
| **Date** | 26/09/2019 |

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# 1 STATEMENT OF COMPLIANCE

**TABLE 1-1 STATEMENT OF COMPLIANCE**

| Were all the conditions of the relevant approval(s) complied with? | |
|---|---|
| Development Consent DA 29/95 | Yes |
| Project Approval PA 08_0111 | Yes |
| Environment Protection Licence EPL 416 | No |
| CML 2 | Yes |
| CCL 728 | Yes |
| CCL 752 | Yes |
| DSL 89 | Yes |
| ML 1157 | Yes |
| ML 1388 | Yes |
| ML 1364 | Yes |
| ML 1283 | Yes |
| ML 1345 | Yes |
| ML 1550 | Yes |
| ML 1661 | Yes |
| ML 1666 | Yes |
| ML 1677 | Yes |
| MPL 204 | Yes |
| MPL 217 | Yes |
| MPL 23 | Yes |
| MPL 233 | Yes |
| MPL 269 | Yes |
| WAL 19181 | Yes |
| WAL 41504 | Yes |
| EL 6598 | Yes |

**TABLE 1-2 NON-COMPLIANCES**

| Relevant Approval | Condition # | Condition Description (Summary) | Compliance Status | Comment | Where Addressed in this Annual Review |
|---|---|---|---|---|---|
| EPL 416 | U2.1 | Noise generated by the premises must not exceed the limits set | Non-compliant | Activities from Austar complied with relevant noise limits on most occasions at the majority of monitoring locations during the 2018-19 reporting period, with the exception of one night (at two locations) in Q2 2019. | **Section 6.6 and Section 11** |
| EPL 416 | L2.1 | For each discharge point, the concentration of a pollutant discharged from that point must not exceed the concentration limits specified | Non-compliant | Laboratory results for monitoring point Licenced discharge point 6 (SW6) result was 667 µs/cm against a limit of 600 µs/cm on one occasion. All other analytes (pH, TSS and Iron) were within limits. | **Section 7.3.4 and Section 11** |

**TABLE 1-3 COMPLIANCE STATUS KEY FOR TABLE 1-2**

| Risk Level | Colour Code | Description |
|---|---|---|
| High | Non-compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence |
| Medium | Non-compliant | Non-compliance with:<br>• potential for serious environmental consequences, but is unlikely to occur; or<br>• potential for moderate environmental consequences, but is likely to occur |
| Low | Non-compliant | Non-compliance with:<br>• potential for moderate environmental consequences, but is unlikely to occur; or<br>• potential for low environmental consequences, but is likely to occur |
| Administrative non-compliance | Non-compliant | Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions) |

# 2 INTRODUCTION

## 2.1 Scope

This Annual Review covers the annual reporting period from 1 July 2018 to 30 June 2019 (the reporting period). Austar Coal Mine Pty Limited (Austar) is required to prepare and submit an Annual Review that satisfies the annual reporting requirements under Development Consent DA 29/95, Project Approval PA 08_0111, Mining Leases, Mining Operations Plan (MOP) and management plans required under the various development consents. This Annual Review has been prepared in accordance with the NSW Government *Annual Review Guideline Post-approval requirements for State significant mining developments, October 2015*.

## 2.2 Background

Austar, a subsidiary of Yancoal Australia Limited (Yancoal), operates the Austar Coal Mine, an underground coal mine located approximately 10 kilometres southwest of Cessnock in the Lower Hunter Valley in NSW. Austar incorporates the former Pelton, Ellalong, Cessnock No. 1 (Kalingo) and Bellbird South Collieries and includes coal extraction, handling, processing and rail and road transport facilities. Pit top facilities are located on Middle Road, Paxton, and the Coal Handling and Preparation Plant (CHPP) is located at Wollombi Road, Pelton (**Figure 2-1** and **Plan 1A**).

Development Consent DA29/95 was granted under Section 91 of the *Environmental Planning and Assessment Act* (EP&A Act) on 14 February 1996, and was most recently modified under Section 75W of the EP&A Act on 25 August 2017. DA29/95 relates primarily to the Bellbird South mining area and operations.

Project Approval PA08_0111 was granted under Section 75J of the EP&A Act on 6 September 2009, and was most recently modified under Section 75W of the EP&A Act in December 2013. PA08_0111 relates primarily to the Stage 3 mining area. PA08_0111 was declared State Significant Development (SSD) under Clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017* via Government Gazette on 15 November 2018.

Surface operations include the Pit Top facilities (including administration buildings, the main access drift, coal clearance, store, workshop and laydown facilities), No 1 shaft (second egress man winder), No 2 shaft (mine dewatering), Kalingo Infrastructure Area (ventilation fans and underground services), the CHPP area (including CHPP, administration areas, Reverse Osmosis plant, overland conveyor and a number of heritage listed buildings in various states of repair), coarse reject emplacement areas (Aberdare, Area 12 and Area 13) and Kitchener Surface Infrastructure Site (ventilation shafts and fans, services borehole/drophole).

The Mining Operations Plan (MOP) was approved by Department of Planning, Industry and Environment – Division of Resources and Geoscience (DPIE-DRG) on 9 September 2016 and covers the period 9 September 2016 to 1 June 2023. The MOP identifies that mining will continue within existing

approved coal reserves of the Bellbird South area (DA29/95) prior to returning to the Stage 3 area (PA08_0111). During the reporting period the MOP was revised and submitted for approval on the 27 June 2019. Approval is expected in the first half of next reporting period.

Mining currently takes place under the approved LWB4-LWB7 Extraction Plan. During the reporting period, mining took place in Longwall panels LWB4 and LWB5 in the Bellbird South mining area. Mining will continue in LWB5 before moving to LWB6 in the next reporting period. The location of approved operations is shown in **Figure 2-1** and **Plan 1C**.

## 2.3 Mine Contacts

**Table 2-1** outlines the contact details for site personnel responsible for mining, coal preparation, rehabilitation, environmental and community liaison at Austar.

**TABLE 2-1 SITE PERSONNEL**

| Position | Name | Company | Contact Number |
|---|---|---|---|
| Mine Operations Manager | Brian Wesley | Austar Coal Mine | (02) 4993 7356 |
| CHPP Superintendent | Jared King | Austar Coal Mine | (02) 4993 7509 |
| Environment & Community Superintendent | Carly McCormack | Austar Coal Mine | (02) 4993 7334 |

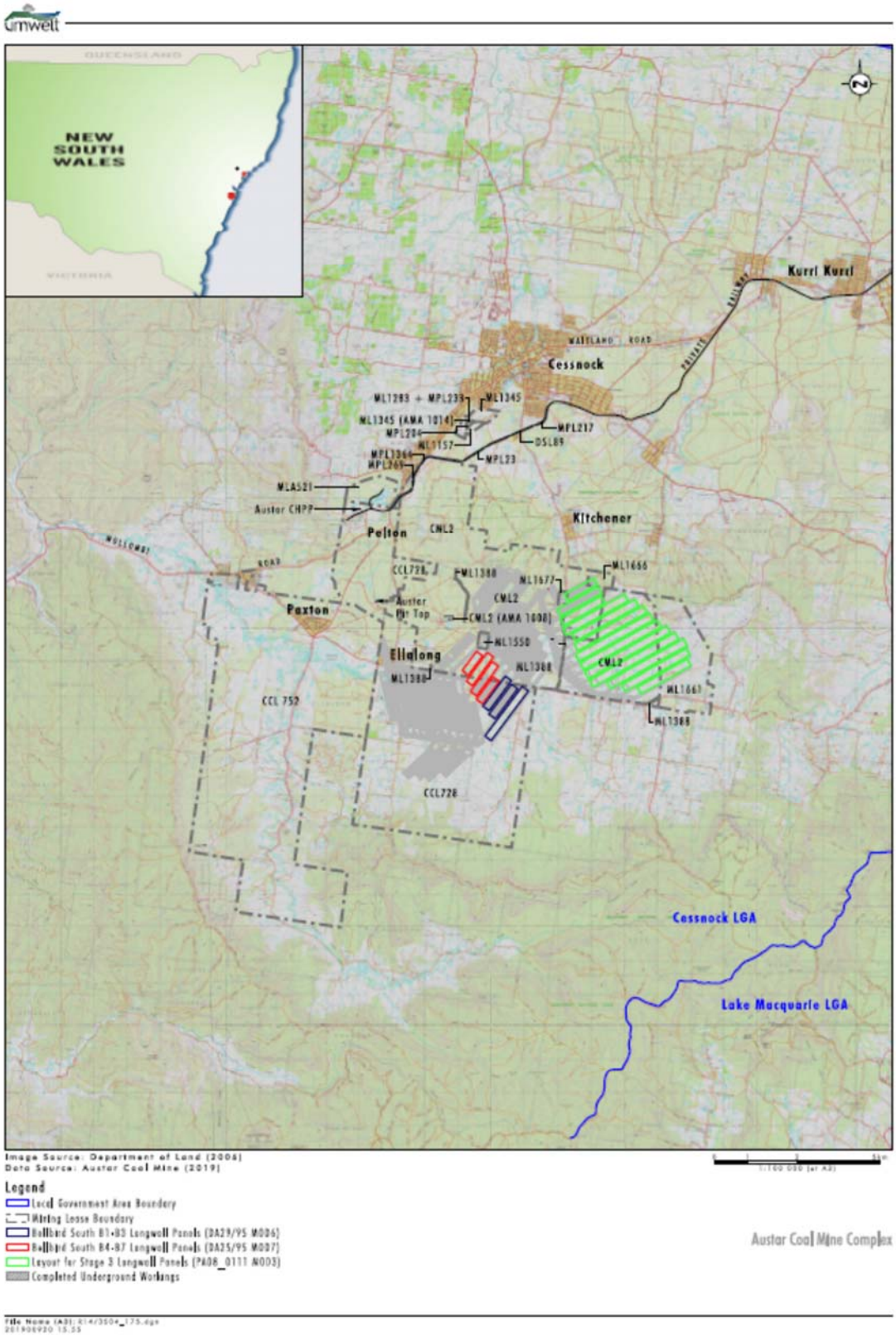


**Figure 2-1 Locality Plan and Approved Mining Operations**

# 3 APPROVALS

Austar's operations are regulated through various leases, licences, permits and approvals as set out below.

## 3.1 Changes to Approvals during the Reporting Period

During the reporting period, only minor changes to approvals were made.

Due to geological factors and the occurrence of coal burst incidents in the LWB4 panel, Austar applied to the Department of Planning, Industry and Environment (DPIE) to shorten the finishing end of LWB4 by a nominal length of 279 metres from the location indicated in the approved Extraction Plan. The shortened finish end was approved in September 2018.

## 3.2 Primary Approvals

### 3.2.1 Development Approval

A summary of Austar's development approvals are outlined in **Table 3-1**.

**TABLE 3-1 DEVELOPMENT CONSENTS HELD BY AUSTAR**

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| DA 29/95 | 14 Feb 1996 | 14 Feb 2022 | Minister for Urban Affairs and Planning | Ellalong Colliery Extension into Bellbird South.<br>Extension of underground mining activities into Bellbird South area (CML 2).<br>Mine life of 21 years with a production of 3 Million tonnes per annum (Mtpa).<br>Reject emplacement.<br>Construction and operation of a new infrastructure site including new ventilation shaft and fan(s) (No. 2 Shaft) adjacent to Sandy Creek Road.<br>Use of Pelton CHPP for washing and handling of coal.<br>Provision of a maximum raw coal stockpile of 100,000 t.<br>Reopening of disused Cessnock No. 1 Colliery shafts for ventilation and access, or the sinking of new shafts, as required.<br>Construction of various water management devices including |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| | | | | sedimentation and clean water dams and drainage systems. |
| DA 29/95 (Modifications) | 27 September 2006 (MOD 1)<br><br>8 Jun 2008 (MOD 2)<br><br>28 May 2009 (MOD 3)<br><br>7 Dec 2010 (MOD 4)<br><br>27 April 2012 (MOD 5)<br><br>29 January 2016 (MOD 6)<br><br>25 August 2017 (MOD 7) | 14 Feb 2022 | Minister for Planning | Extension of Underground Mining Activities into Bellbird South (Ellalong Colliery) – Modification.<br>Use of long wall top coal caving (LTCC) mining methods in two longwall panels.<br>Installation of a larger capacity fan at the site approved for DA 8/1999/1658.<br>Installation of a new downcast ventilation shaft.<br>Installation of a new 10 MVA substation.<br>Installation of a nitrogen inertisation plant with a 2,000-cubic metre capacity.<br>Provision of a diesel and emulsion fluid storage area and dispatch system.<br>Installation of a tube bundle shed to house electronic monitoring equipment.<br>Upgrade of the existing water treatment plant.<br>Upgrade of water reticulation and pumps.<br>Minor embankment stabilisation works at Kalingo Dam.<br>Longer and wider panels A4 and A5.<br>Extract one additional Longwall Panel A5a (LW A5a).<br>Extension of Longwall Panel A5a<br>Extension to Bellbird South development consent area to include Longwall panels LWB1 to LWB7.<br>Extension of consent to 14 February 2022. |
| Project Approval 08_0111 | 6 Sep 2009 | 31 Dec 2030 | Minister for Planning | Stage 3 Expansion Project - extension to longwall mining area to east of existing operations. Key features:<br>Longwall production from the Greta coal seam from panels A6 to A17 using LTCC.<br>Construction of a new surface infrastructure site south west of Kitchener including ventilation shafts and fans, winders, bath house facilities, a workshop, electricity substation, store and offices. Construction of a new road and intersection at Quorrobolong Road. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| | | | | Coal will continue to be brought to the surface at Austar's existing surface facilities at Paxton. These facilities will continue to be used to take large mining equipment into and out of the mine.<br>Continued use of Austar's existing water management, coal transport systems, coal preparation plant and rejects emplacement areas. |
| Project Approval 08_0111<br>(Modifications) | 4 May 2010<br>(MOD 1)<br><br>13 March 2012<br>(MOD 2)<br><br>17 Dec 2013<br>(MOD3) | 31 Dec 2030 | Delegate for Minister for Planning | Minor change to subsidence impact performance measures to built features in Table 1 of Project Approval. The key performance indicator which was amended in the Project Approval requires the project does not cause built features to go beyond safe, serviceable and repairable criteria, unless the landowner agrees in writing.<br>Reorientation of the Stage 3 longwalls. Removal of longwall A6, and extraction of coal in longwalls A7 to A19, which are a reorientation of previously approved longwalls A7 to A17 to more closely align with the direction of principal stress. In addition, the chain pillar widths are increased from 45m to 55m to reduce roadway failure risks which in turn further minimises subsidence. The modification will enable more efficient and safer extraction of coal from the Stage 3 area.<br>Extension of Stage 3 longwalls A7 to A10. |
| DA 74/75/79 | 4 Dec 1975 | Nil expiry | Cessnock City Council (Council) | Development Consent for a coal mine at Ellalong including:<br>Approval for underground coal mining.<br>Construction of a new access drift, upcast shaft and ventilation shaft.<br>Expansion of the Pelton CHPP.<br>Conveyance of coal from the Ellalong pit top to the Pelton CHPP Operation for the washing and handling of coal.<br>Water management systems.<br>Upgrade of the Pelton rail loading facility and railway spur.<br>Reject emplacement underground, open cut areas adjoining Pelton and other abandoned mine sites. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| DA 118/680/93 | 8 Oct 1980 | Nil expiry | CCC | Downcast Ventilation Shaft and Man Access Shaft, Bathhouse and Offices at Ellalong Colliery. |
| DA 118/691/181 | 26 Nov 1992 | Nil expiry | CCC | Pelton Open Cut Coal Mine.<br>Approval of an open cut coal mine adjoining Pelton Colliery up to 300,000 tonnes of coal and underground mining of approximately 27,000 tonnes of coal from a section of prior workings south of the proposed open cut. |
| DA 118/691/181 | 11 Jan 1993 | Nil expiry | CCC | Pelton Open Cut Coal Mine – Modification.<br>Extension of open cut mining area.<br>Infrastructure and water management modifications. |
| DA 118/691/229 | 7 Jan 1993 | Nil expiry | CCC | Pelton Coal Handling Preparation Plant – Raw Coal Handling Facility, Washed Coal Facility and Upgrading of the Water Management System.<br>Upgrade and replacement of coal handling infrastructure such as surge bin, automatic stacking system, reclaim facilities and skyline conveyor.<br>Increase in stockpile capacity.<br>Upgrade to water management system.<br>Extension of the reclaim tunnel.<br>Construction of a mine water transfer pipeline from Ellalong Colliery to Pelton.<br>Provision of underground workings for emergency mine water disposal.<br>Upgrade of lime treatment plant. |
| DA 118/693/42 | 26 Nov 1993 | Nil expiry | CCC | Extension of Pelton Open Cut Mine.<br>Extension of open cut mining area including emplacement of overburden in previously mined blocks and extension of the mine's water management system. |
| DA 118/694/120 | 27 Jun 1994 | Nil expiry | CCC | Approves the extraction of longwall panels LW13 and LW14 as a minor extension to the Ellalong Colliery within CML2. |
| DA 118/694/152 | 7 Jul 1994 | Nil expiry | CCC | Relocatable Office and Temporary Bathhouse at Pelton Colliery. |

| Consent Description | Date | Expiry | Approval Authority | Summary of Approved Development |
|---|---|---|---|---|
| DA 118/695/22 | 12 Jul 1995 | Nil expiry | CCC | Establishment of an overburden stockpile for the Pelton Open Cut Operations. |
| DA 118/695/81 | 12 Jul 1995 | Nil expiry | CCC | Additions for Bathhouse, office and car park at Ellalong Colliery.<br>Extension to the bathhouse at the Ellalong drift site.<br>Extension of existing offices or construction of portable offices.<br>Construction of a 4000-square metre car park. |
| DA 8/1999/1658 | 18 Feb 2000 | Nil expiry | CCC | Relocation of Ventilation Facilities at Bellbird South Underground Mine.<br>Installation of a ventilation shaft and fan house.<br>Upgrading of the existing access track to the site from the Pelton - Ellalong Road. |
| DA 8/2002/655/1 | 16 Oct 2002 | Nil expiry | CCC | Compressor and Pump Enclosure Buildings at Ellalong Colliery. |
| DA 118/695/18 | 21 Feb 1995 | Nil expiry | CCC | Relocatable Office at Pelton Colliery. |
| DA 8/2012/503/1 | 19 Dec 2012 | Nil expiry | CCC | Extension of car parking area associated with Austar Coal Mine |

### 3.2.2 Mining Authorities

Details of the relevant mining authorities are summarised Table 3-2.

**TABLE 3-2 MINING LEASES HELD BY AUSTAR**

| Mining Title (Act) | Date Granted | Expiry Date | Area (ha) | Surface | Depth Restriction |
|---|---|---|---|---|---|
| EL 6598 (1992) | 13/07/2006 | 16/06/2021 | 7,370 | Yes | Various |
| Dam Site Lease 89 (1901) | 04/04/1908 | 04/04/2030 | 3.961 | Yes | Surface to 15.24 metres |
| Mineral Lease No. 1157 (1906) | 8/07/1949 | 08/07/2028 | 10.24 | Yes | Surface to 15.24 metres |
| Mineral Lease No. 1283 (1906) | 13/07/1961 | 13/07/2022 | 1.973 | No (sub-surface) | 7.62 to 15.24 metres |

| Mining Title (Act) | Date Granted | Expiry Date | Area (ha) | Surface | Depth Restriction |
|---|---|---|---|---|---|
| Mining Purposes Lease No. 23 (1906) | 17/05/1909 | 17/05/2030 | 2.421 | Yes | Surface to 15.24 metres |
| Mining Purposes Lease No. 204 (1906) | 03/02/1916 | 03/02/2039 | 1.2 | Yes | Surface to 15.24 metres |
| Mining Purposes Lease No. 217 (1906) | 12/04/1916 | 03/02/2039 | 0.6298 | Yes | Surface to 15.24 metres |
| Mining Purposes Lease No. 233 (1906) | 01/08/1916 | 01/08/2036 | 1.973 | Yes | Surface to 7.62 metres |
| Mining Purposes Lease No. 269 (1906) | 07/12/1917 | 07/12/2018* | 2.79 | Yes | Surface to 6.1 metres below the level of the rails when laid |
| Mining Purposes Lease No. 1364 (1906) | 28/10/1968 | 28/10/2029 | 0.4527 | Yes | Surface to 15.24 metres |
| Consolidated Coal Lease No. 728 (1973) | 10/10/1989 | 30/12/2023 | 3296.8 | Various | Various |
| Consolidated Coal Lease No. 752 (1973) | 23/05/1990 | 30/12/2023 | 3802 | No (Sub-surface) | Various |
| Consolidated Mining Lease No. 2 (1992) | 24/03/1993 | 06/07/2025 | 3388 | Various | Various |
| Mining Lease No. 1345 (1992) | 23/03/1995 | 30/12/2023 | 41.895 | Yes | Surface to 900 metres depth |
| Mining Lease No. 1388 (1992) | 02/04/1996 | 02/04/2038 | 15.12 | No (sub-surface) | 30.48 metres to unlimited depth |
| Mining Lease No. 1550 (1992) | 24/06/2004 | 23/06/2025 | 14.11 | Yes | Surface to 20 metres |
| Mining Lease No. 1661 (1992) | 22/11/2011 | 22/11/2032 | 469.32 | No (sub-surface) | 20 to 900 metres |
| Mining Lease No. 1666 (1992) | 25/01/2012 | 25/01/2033 | 34.13 | No (sub-surface) | 30.48 to 900 metres |
| Mining Lease No. 1677 (1992) | 23/08/2012 | 22/08/2032 | 9.16 | Yes | Surface to 30.48 metres |

| Mining Title (Act) | Date Granted | Expiry Date | Area (ha) | Surface | Depth Restriction |
|---|---|---|---|---|---|
| Mining Lease Application No. 521 (1992) | Lodged February 2016 | Pending Approval | 115 | Yes | Surface to 50m |

*Renewal sought

### 3.2.3 Environment Protection Licence

Austar operates in accordance with Environment Protection Licence 416 (EPL 416), issued on 5 April 2000 and last updated on 15 December 2017 by the NSW Environment Protection Authority (EPA), under the authority of the *Protection of the Environment Operations Act 1997*.

## 3.3 Ancillary Approvals

### 3.3.1 Extraction Plans

An Extraction Plan for LWB4 to LWB7 was approved by the DPIE on 20 September 2017. This was reviewed to include the shortening of LWB4 and approved in February 2019. LWB4 was extracted from October 2017 to November 2018. Extraction of LWB5 commenced in January 2019 and continued for the remainder of this reporting period.

A summary of Extraction Plan / SMP approvals for Bellbird South (LWB1-LWB7) and Stage 3 mining areas held by Austar is outlined in Table 3-3. Previous SMP approvals for the Bellbird South Stage 2 area are also shown in Table 3-3.

**TABLE 3-3 - SUBSIDENCE MANAGEMENT PLAN / EXTRACTION PLAN APPROVALS HELD BY AUSTAR**

| Description | Date | Expiry Date | Approval Authority | Approval Summary |
|---|---|---|---|---|
| Extraction Plan Approval | 30 May 2013 | 31 Dec 2030 | DPIE | Extraction Plan approval for Austar Longwalls A7 to A10 |
| SMP Approval 13/1876 | 3 June 2013 | 31 May 2020 | DPIE-DRG | Subsidence Management Plan approval for Austar Longwalls A7 to A10. |
| Extraction Plan Approval | 6 Jan 2014 | 31 Dec 2030 | DPIE | Extraction Plan approval for Austar Longwalls A7 to A10 to correspond to PA08_0111 MOD3 and retraction to LWA8 start position. |
| SMP Variation Approval 13/1876 | 7 Jan 2014 | 31 May 2020 | DPIE-DRG | Subsidence Management Plan approval for Austar Longwalls A7 to A10 to correspond to PA08_0111 MOD and retraction to LWA8 start position. |

| Description | Date | Expiry Date | Approval Authority | Approval Summary |
|---|---|---|---|---|
| SMP Variation Approval 13/1876 | 19 Feb 2014 | 31 May 2020 | DPIE-DRG | Subsidence Management Plan approval for retraction to LWA9 commencing end |
| Extraction Plan LWB1 to LWB3 | 16 May 2016 | Not specified | DPIE | Extraction Plan for Bellbird South Longwalls B1 to B3 was approved by DPIE on 4 July 2016 |
| Extraction Plan LWB4 to LWB7 | 1 February 2019 | Not specified | DPIE | Extraction Plan for Bellbird South Longwalls B4 to B7 updated to include the shortening of LWB4 was approved by DPIE on 12 February 2019 |

### 3.3.2 Mining Operations Plan

In accordance with the *Mining Act 1992*, Austar conduct operations in accordance with an approved Mining Operations Plan (MOP). The MOP covers underground mining, ventilation, required infrastructure, coal handling, reject emplacement, rehabilitation, and other associated activities. The MOP is approved for the period September 2016 to June 2023. During the reporting period, the MOP was revised and submitted to DPIE. Approval is expected in the first half of next reporting period.

### 3.3.3 Environmental Management Plans

In accordance with DA29/95 and PA08_0111, Austar have developed and implemented a range of environmental management plans. **Table 3-4** outlines the environmental management plans required by each relevant development consent, the determining authority and their approval status during the reporting period.

The Environmental Management Strategy (EMS), and environmental management plans relevant to mining in the Bellbird South area, were updated and submitted to DPIE in June 2018 and approved on 1 August 2018.

Operations during this reporting period were undertaken in accordance with the EMS and environmental management plans as listed in **Table 3-4**. Environmental management plans are available from the Austar website: www.austarcoalmine.com.au

**TABLE 3-4 ENVIRONMENTAL MANAGEMENT PLANS**

| Plan | DA Requirement | Approval Authority | Approval Date |
|---|---|---|---|
| Environmental Management Strategy, June 2018 | DA29/95 – Schedule 5 Condition 1<br>PA08_0111 - Schedule 7 Condition 1 | DPIE | 1 August 2018 |

| Plan | DA Requirement | Approval Authority | Approval Date |
|---|---|---|---|
| Environmental Monitoring Program, June 2013 | DA29/95 – Schedule 5 Condition 2<br>PA08_0111 - Schedule 7 Condition 1 | DPIE | 1 August 2018 |
| Shaft Construction Environmental Management Plan, June 2012 | PA08_0111 – Schedule 4 Condition 1, 2, 8 | DPIE | 15 June 2012 |
| Landscape Management Plan – Kitchener SIS, June 2013 | PA08_0111 – Schedule 6 Condition 4 | DPIE | 22 July 2013 |
| Site Water Management Plan, July 2018 | DA29/95 – Schedule 3 Condition 6-11<br>PA08_0111 – Schedule 4 Condition 9 | DPIE | 1 August 2018 |
| Noise and Vibration Management Plan, June 2018 | DA29/95 – Schedule 3 Condition 13-16<br>PA08_0111 – Schedule 4 Condition 2-3 | DPIE | 1 August 2018 |
| Air Quality and Greenhouse Gas Management Plan, June 2018 | DA29/95 – Schedule 3 Condition 17-20<br>PA08_0111 – Schedule 4 Condition 6-7 | DPIE | 1 August 2018 |
| Aboriginal Cultural Heritage Management Plan, June 2018 | PA08_0111 – Schedule 3 Condition 4 and Schedule 4 Condition 10 | DPIE | 1 August 2018 |
| Historic Heritage Management Plan, January 2014 | PA08_0111 – Schedule 4 Condition 11 | DPIE | 19 February 2014 |

# 4 OPERATIONS SUMMARY

## 4.1 Exploration

There were no physical exploration activities during the reporting period. During the reporting period, exploration activities comprised of a desktop review of geological and coal quality information in the eastern portion of Austar Exploration Licence (EL) 6598. Specifically, in the area to the east of the Abernethy Fault.

During the next reporting period (2019-2020), up to five exploration boreholes are planned. The purpose of these boreholes is to further optimise resource definition, coal quality modelling and seam structure modelling potential.

An annual exploration report is lodged annually covering the period 13 July – 12 July the following year. This was lodged in August 2019.

## 4.2 Mining

### 4.2.1 Underground Mining Operations

The Austar Coal resource covers a large area of the Greta Seam in the Newcastle Coalfield, situated approximately 10km west of Cessnock. Mining in the second Stage 3 panel (LWA8) was completed 24 June 2015. No mining has occurred in the Stage 3 area since then.

Extraction of longwall panel LWB4, within the Bellbird South mining domain, commenced 5 October 2017 and was completed 29 November 2018. The longwall equipment was then relocated to longwall panel LWB5 where extraction began 17 January 2019, with completion of LWB5 planned to occur in the latter half of 2019.

As outlined in the previous Annual Review, LWB4 had a planned total panel length of 1,125m. Due to geological factors and the occurrence of coal burst incidents in the LWB4 panel, approval was sought to shorten the finishing end of LWB4 by a nominal length of 279 metres from the location indicated in the approved Extraction Plan. LWB4 was safely completed to the revised finishing end of 850m. To minimise safety risks posed by seam displacement within the coal seam, Austar Coal Mine plans to apply for the shortening of LWB5, LWB6 and LWB7 in the next reporting period.

Mining undertaken in the 2018-19 reporting period, and planned for the next reporting period is presented in **Plan 3A**.

### 4.2.2 Ventilation

A mine gas monitoring station is located on the surface near the No.3 Shaft facility. Monitoring data indicates low levels of seam gas emissions comprising carbon dioxide ($CO_2$) (2018-19 Average 0.14%) and methane ($CH_4$) (2018-19 Average 0.02%) under normal operating conditions.

### 4.2.3 Production and Forecast Production

Austar Coal Mine is approved by Project Approval PA 08_0111 to extract up to 3.6 Mt of ROM coal from the Austar Coal Mine Complex.

**Table 4-1** provides a summary of coal production and waste generation for the 2018-19 reporting period.

**TABLE 4-1 PRODUCTION AND WASTE SUMMARY**

| Material | Approved Limit (PA 08_0111) | 2017 - 2018 Previous Reporting Period | 2018-2019 Current Reporting Period | 2019-2020 Next Reporting Period (Forecast) |
|---|---|---|---|---|
| Waste Rock / Overburden | N/A | N/A | N/A | N/A |
| Fine Reject (Tailings) (ML) | - | 255,966 | 155,296 | - |
| Coarse Reject (t) | - | 25,159 | 20,000 | 26000 |
| ROM Coal (t) | 3,600,000 | 1,413,065 | 705,352 | 148,000 |
| Saleable Product (t) | - | 1,043,353 | 595,231 | 122,000 |

Coal production at Austar during the reporting period was significantly lower than predicted. This is attributed to a number of factors:

- Several coal burst incidents occurred on Longwall LWB4 production face between February and May 2018. These incidents resulted in prohibition notices being issued by the Resources Regulator which significantly limited longwall mining capacity in LWB4 during the first two months of the reporting period. These notices were lifted on the 30 July and 3 August 2018. LWB4 production capacity was also significantly impacted by the implementation of destress drilling and other coal burst risk management controls.
- LWB4 length was shortened from 1125m to 850m due to potentially elevated coal burst risk in the abandoned part of the panel.
- A longwall move from LWB4 to LWB5 during December and January resulted in no coal production over that period.

Coal is processed at the Austar CHPP. During the reporting period, fine tailings were transported by pipeline and emplaced in old underground workings within the mining lease area. The return water from the tailings gravitates through the old mine workings and is recovered by dewatering pumps back into Austar's contaminated water management system for treatment and reuse in the CHPP. Water treated by the Reverse Osmosis plant can be discharged off-site under Austar's EPL 416.

Coarse reject was transported by truck, predominantly to the Aberdare Reject Emplacement Area. The East Open Cut Void was also used as an alternative emplacement area when Aberdare Reject Emplacement Area was unavailable due to adverse weather conditions.

Analysis of the waste materials at Austar indicates that it contains sulphur in the organic or pyritic form, and therefore has the potential for acid mine drainage (AMD). Details regarding the control of acid water onsite are outlined in the approved Site Water Management Plan (SWMP). Rehabilitation strategies have been developed to reduce the potential for acid mine drainage by utilising emplacement areas that drain to old mine workings.

### 4.3 Product Coal Transport

The existing approved coal transport system has continued to be utilised to transport product from the site. During the reporting period 496,430 tonnes of product coal from Austar was transported 65 km by rail to Port Waratah Coal Services (PWCS) and Newcastle Coal Infrastructure Group (NCIG) ship coal loading facilities for sale on the export market.

No product coal was transported by road.

### 4.4 Hours of Operation

Mining and coal processing activities were undertaken 24 hours per day, seven days per week during the reporting period.

### 4.5 Waste Management

Waste collected during the reporting period, as provided by Austar's waste management contractors, is summarised and compared to the previous reporting periods in **Table 4-2**.

**TABLE 4-2 WASTE MANAGEMENT DATA (TONNES)**

| | Paper & Cardboard | Chemical Anchors | Oily Filters | Oily Water | Waste Oil | Timber | Medical & Sanitary | Oily Rags | Mixed Solid Waste | Scrap Metal | Printer Cartridges |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2018-19** | 7.88 | 1.35 | 0.97 | 32.25 | 28.8 | - | 0.2 | 0.18 | 249.75 | 166.89 | 0.17 |
| **2017-18** | 6.88 | 1.94 | 0.97 | 2.31 | 28.50 | 17.64 | 0.16 | 0.20 | 505.8 | 270.55 | 0.156 |
| **2016 -17** | 7.62 | 4.74 | 1.07 | - | 33.9 | 13.50 | 0.39 | 0.16 | 517.41 | 336.26 | 0.074 |

Waste generation has remained relatively consistent when compared to the previous reporting periods. This can be attributed to a maintained focus on effective waste management and a reduction in production. Oily water tonnages are predominantly due to a change out of solcenic oil in underground equipment, and is not regularly scheduled, which explains the large difference between reporting periods.

Waste contractors undertake weekly inspections of waste bins and report any issues to Austar staff. If cross contamination is an ongoing issue, or a waste improvement is identified, employees and contractors can be educated through tool box talks and inductions.

## 4.6 Planned Operations Next Reporting Period

During the next reporting period, longwall mining operations will continue in LWB5 before moving into LWB6 with extraction scheduled for approximately October 2019 to February 2020. At the completion of LWB6, Austar plans to re-establish infrastructure prior to the recommencement of mining in the Stage 3 area.

# 5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The Department of Planning, Industry and the Environment Resources Regulator (DPIE-RR) reviewed the 2017-18 AR and provided a formal response on 5 March 2019. The AR was accepted subject to two conditions outlined in the table below.

DPIE reviewed the AR and confirmed that the AR 'generally satisfies the reporting requirements of development consent DA 29/95 and project approval MP 08_0111'. No actions were requested by the DPIE in their review.

Actions committed to by Austar in the 2017-18 AR are also provided in **Table 5-1**.

**TABLE 5-1 ACTIONS REQUIRED FROM PREVIOUS REVIEW**

| Action Required from Previous Annual Review | Requested by | Status | Action taken by Austar | Where discussed in Annual Review |
|---|---|---|---|---|
| Sediment controls are to be maintained, including removal of sediment within diversions and sediment fencing, within the Kitchener Surface Infrastructure Site. | DPIE-RR | Complete | Sediment fencing at Kitchener SIS was removed and replaced with new materials. Sediment was removed. | **Section 6.1** |
| Determine a final landuse and relevant approvals and consents required for the surface flows within Area 13 and including potential reinstatement of surface flows within the area. | DPIE-RR | Ongoing | The *Final Cessnock City (Black Creek) Floodplain Risk Management Study and Plan Report W4951* (February 2016) states "*all design event modelling has been undertaken assuming no mitigation benefit from the sinkhole with all sinkhole catchment flows applied to Bellbird Creek*". The flood mitigation option of a detention basin in Bellbird Creek on Austar Coal Mine CHPP land is also included in the final report with low priority for implementation. It is noted Austar land be acquired for the project.<br><br>Final landuse for this area has been outlined in the MOP which was lodged for approval in June 2019.<br><br>Further works assessing the required responsibilities, approvals and consents will be undertaken in future years. | - |

| Action Required from Previous Annual Review | Requested by | Status | Action taken by Austar | Where discussed in Annual Review |
|---|---|---|---|---|
| | | | A number of sink holes were repaired in this area during the year. | |
| Continue to address the findings and actions of the Independent Environmental Audit. | 2017-18 AR | Ongoing | Actions have been progressed throughout the year. | **Section 10** |
| Update the Historic Heritage Management Plan to include a mechanism of review after lodgement of an Annual Review, Audit report or relevant incident. | 2017-18 AR | N/A | Historic Heritage Management Plan – Austar Coal Mine Project Stage 3 (January 2004) is a requirement of PA08_0111. Operations during the reporting period have been undertaken in the Bellbird South Mining Area under DA29/95. | - |
| Progress heritage assessments to support demolition of existing structures and foundations at Bellbird, Pelton, and Cessnock No. 1 (Kalingo) Collieries. | 2017-18 AR | Ongoing | Consultation with Council on the process for submitting a demolition application for the dilapidated stables and store buildings at Pelton Colliery. | - |
| Continued implementation of noise pollution reduction program at the Austar CHPP. | 2017-18 AR | Ongoing | The Noise PRP has continued to be implemented during the reporting period. | **Section 6.6.2** |
| Phase 1 Contamination Assessment to be reviewed and actions considered. | 2017-18 AR | Ongoing | Not completed during the reporting period. | - |
| Consultation is to be undertaken with OEH to cease ecological monitoring of the Stage 2 area. | 2017-18 AR | Complete | Completed. During the reporting period OEH agreed that ecological monitoring was complete in the Stage 2 area. | **Section 6.4** |

| Action Required from Previous Annual Review | Requested by | Status | Action taken by Austar | Where discussed in Annual Review |
|---|---|---|---|---|
| Expand the existing rehabilitation monitoring program for Aberdare Reject Emplacement Area to include Rehabilitation Areas 12 and 13. | 2017-18 AR | Complete | Rehabilitation monitoring was undertaken during the reporting period and included areas 12 and 13. | **Section 8.2** |
| Undertake soil testing and seek expert advice for application of ameliorants and further seeding of vegetated areas, if required, to increase groundcover at Aberdare Reject Emplacement Area for land in the Ecosystem Landuse and Establishment phase. | 2017-18 AR | N/A | Not required during the reporting period, however may be undertaken in future reporting periods. | **Section 8** |
| Review the geotechnical investigation commissioned during the 2017-18 reporting period and report on the findings. | 2017-18 AR | Ongoing | The geotechnical investigation was reviewed and further works undertaken during this reporting period. | **Section 8** |
| Progressive implementation of the erosion and sediment control plan at the Aberdare Extended Emplacement area for capped areas with potential to drain to natural watercourses. Progress design and installation of the clean water diversion drain. | 2017-18 AR | Ongoing | Further capping was undertaken during the reporting period, with all erosion and sediment controls deemed adequate for the period. | **Section 8** |

| Action Required from Previous Annual Review | Requested by | Status | Action taken by Austar | Where discussed in Annual Review |
|---|---|---|---|---|
| Continue to cap areas of reject at Aberdare Reject Emplacement Area where the reject has reached design levels. | 2017-18 AR | Ongoing | Capping has been undertaken during the reporting period. | **Section 8** |
| Submission of a new MOP including additional tailings boreholes to Pelton underground workings. Installation of those boreholes in accordance with the new MOP as required. | 2017-18 AR | Complete | A revised MOP was submitted for approval during the reporting period, which included additional tailings boreholes to Pelton underground workings. No additional tailings holes were required during this reporting period. | **Section 3.3.2** |

# 6 ENVIRONMENTAL PERFORMANCE

## 6.1 Environmental Performance Summary

**Table 6-1** outlines the key environmental performance or management aspects encountered at Austar and details how they have been addressed, as well as the implementation of any management measures from the reporting period and proposed improvements for following years.

Where practical, environmental management of the key environmental aspects managed at Austar have been discussed in **Table 6-1**. Where tabulating the information is not practical, further detail is included in the following sections of this report.

**TABLE 6-1 ENVIRONMENTAL PERFORMANCE SUMMARY**

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Air Quality (**Section 6.3**) | Refer **Section 6.3** for detail on approval criteria and background levels. | Compliant with DA29/95 and PA08_0111. | Austar complied with all air quality criteria during the reporting period. There were no air quality complaints or reportable incidents related to air quality in the reporting period. There were a number of elevated results reported to the DPIE, however these were not due to Austar's operations and no further actions have been required. | Air Quality will continue to be managed in accordance with the Air Quality and Greenhouse Gas Management Plan. |
| Biodiversity (**Section 6.4**) | Refer **Section 6.4** for detail on EIS predictions. | Compliant with DA29/95 and PA08_0111. | No significant observable impacts as a result of longwall mining were identified. | Ecological monitoring will continue in accordance with the relevant Extraction Plan Biodiversity Management Plan. |
| Vibration and Blasting (**Section 6.5**) | Refer **Section 6.5** for detail on monitoring criteria. | Compliant with DA29/95 and PA08_0111. | Non-mandatory vibration monitoring criteria adopted were not exceeded during the reporting period. | Vibration and blasting will continue to be managed in accordance with the Noise and Vibration Management Plan. |
| Noise (**Section 6.6**) | Refer **Section 6.6** for detail on approval criteria. | Two exceedances of EPL noise criteria at the CHPP in the reporting period (on the one night at two sites). | Noise management at the CHPP will continue to be managed and improved where possible. | Noise monitoring and management will continue in accordance with the Noise and Vibration Management Plan and Noise Reduction PRP. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Aboriginal Cultural Heritage (**Section 6.7**) | The Aboriginal Cultural Heritage Management Plan provides a consolidated framework and process for managing Aboriginal cultural heritage responsibilities within the Austar Coal Mine in compliance with all Aboriginal cultural heritage management requirements under legislation, guidelines and existing consents. | Compliant with DA29/95 and PA08_0111. | There were no incidents or complaints regarding cultural heritage during this period. | Continue to assess and undertake operations in accordance with the Aboriginal Cultural Heritage Management Plan. |
| Mine Subsidence (**Section 6.8**) | Refer **Section 6.8** for detail on predictions. | Compliant with DA29/95 and PA08_0111. | The observed subsidence resulting from the extraction of Longwall B4 was generally similar to or less than the maximum predicted subsidence. The profiles of observed subsidence also reasonably matched those predicted, but with reduced magnitudes. | Continue to monitor and manage subsidence impacts in accordance with the Extraction Plan and Subsidence Monitoring Program. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Water – Surface Water (**Section 7.3**) | Refer **Section 7.3** for detail on approval criteria and background levels. | Compliant with DA29/95, PA08_0111. One exceedance of water quality criteria relating to EPL 416. | Discharge from SW6 was in accordance with EPL criteria, with the exception of one elevated EC result (667µs/cm against a limit of 600µs/cm).<br>Monitoring of the Investigation Drainage Line at the CHPP continued in accordance with the EPL Pollution Reduction Program.<br>Surface water quality trends indicate no adverse mining impacts on the water quality of the local waterways.<br>There have been no community complaints in relation to water quality during the reporting period. No TARPs under the Water Management Plan were triggered. | Surface water monitoring and management will continue in accordance with the Site Water Management Plan. |
| Water – Groundwater (**Section 7.4**) | Refer **Section 7.4** for detail on approval criteria and background levels. | Compliant with DA29/95 and PA08_0111. | The predictions in groundwater impact assessments from the DA29/95 MOD6 EA, and the DA29/95 MOD7 EA have, in general, been validated by measurements. The predictions when compared to current groundwater monitoring data (groundwater levels, quality | Groundwater monitoring and management will continue in accordance with the Site Water Management Plan and relevant Extraction Plan Water Management Plans. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| | | | and mine inflow) are valid. No TARPs under the Water Management Plan were triggered. | |
| Erosion and Sediment Control | PA 08_0111 requires an Erosion and Sediment Control Plan as part of the Site Water Management Plan (SWMP). | There were no reportable incidents or community complaints in relation to Erosion and Sediment control during the reporting period. Operations remained compliant with the SWMP.<br><br>Monthly inspections are undertaken which incorporate inspections of erosion and sediment control and drainage lines.<br><br>During the reporting period, the sediment control structures at the Kitchener SIS were cleaned out and replaced as required. | Erosion and sediment control is undertaken according to the SWMP. A range of erosion and sediment control measures have been implemented across the mining complex with the aim of preventing soil erosion and the entry of sediments into surrounding water bodies. Monthly environmental inspections are undertaken to inspect the sediment control structures for capacity, structural integrity and effectiveness. | Erosion and Sediment control will continue to be managed in accordance with the Site Water Management Plan. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Hydrocarbon management | Not applicable. | There were no reportable incidents in relation to hydrocarbon management during the reporting period.<br><br>The hydrocarbon remediation area was managed to ensure no contamination to nearby areas.<br><br>Spill kits in all hydrocarbon storage areas are monitored weekly by the waste contractor and replenished as necessary. Bunded hydrocarbon storage areas are also monitored weekly by the waste contractor and pump out is scheduled as required. | Hydrocarbon management systems are designed and installed in accordance with Australian Standards and EPA guidelines.<br><br>Austar operates a hydrocarbon remediation area at the CHPP to manage hydrocarbon contaminated material retrieved from the site. The area is signposted and has three bunded cells for segregation of materials of different ages. The bunded area was constructed on a disused laydown area and is within the sites dirty water catchment. Contaminated materials are periodically turned to allow an adequate supply of oxygen to microbes that use the contaminants as a source of food and energy. | Hydrocarbon management will continue to be undertaken in accordance with internal procedures and general good management practices. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Weed and Feral Animal Management and Control | Not applicable. | Green cestrum *(Cestrum Parqui)* was controlled along creek banks near Shaft 3 during the reporting period. The success of these control works will be monitored in future reporting periods. | Weeds and feral animals are managed on an as needs basis. During the next reporting period, they will continue to be monitored in monthly inspections and treated as required. | Weeds and feral animals will be treated according to good land management practices. |
| Visual Amenity and Lighting | Reject emplacement areas will be constructed to minimise visual impacts upon residents in the vicinity and from roads.<br><br>Emplacement areas may include bunds and buffer zones to minimise visual impact.<br><br>Screening will be used as required.<br><br>Lighting will be positioned to shine into the Kitchener SIS and light shields will be used where practical. | There were no community complaints or non-compliances related to visual impacts or lighting during the reporting period. | Visual impacts and lighting will continue to be managed according to the EMS, guidelines and internal procedures as appropriate. | Visual Amenity and Lighting will continue to be managed consistent with current good practice and commitments made in relevant EAs. |

| Aspect | Approval Criteria / EIS Prediction | Performance During the Reporting Period | Trend / Key Management Implications | Implemented / Proposed Management Actions |
|---|---|---|---|---|
| Historic Heritage | Fourteen potential historic heritage sites are located within the Stage 3 mining area and may potentially experience some minor subsidence impacts. The EA (Umwelt, Oct 2008) predicts there is unlikely to be any direct or indirect impacts on the identified potential historic heritage items within the assessment area.<br><br>There are a number of heritage items in Austar infrastructure areas of the site that require ongoing management or demolition. | No mining occurred in the Stage 3 area during the reporting period and no impacts were observed on historic heritage items in this area.<br><br>There was no restoration or demolition works on any Austar owned heritage structures during the reporting period. | Austar and DPIE-RR have identified some heritage structures as safety issues onsite. They are appropriately managed to ensure the safety of workers onsite. | Austar will progress plans to demolish those structures that will otherwise pose safety risks. Austar will seek Council approval prior to any demolition works occurring. |
| Spontaneous Combustion | Monitoring and response procedures will be used to minimise spontaneous combustion issues. | There were no spontaneous combustion events during the reporting period. | Spontaneous combustion is managed through the reject haulage and emplacement area procedure. | Monitoring for outbreaks of spontaneous combustion will continue and outbreaks will be responded to as required. |
| Bushfire | Maintain Asset Protection Zones (APZs) and Strategic Fire Advantage Zones (SFAZs) in accordance with Bushfire Management Plan. | Austar continued to maintain APZs and SFAZs around its key operations. Slashing of APZs is undertaken on a routine basis. | Austar continues to maintain the area around its operations, including pit top facilities, CHPP, remote infrastructure areas and emplacement areas. | Austar will continue to implement the actions identified in the Bushfire Management Plan. |

## 6.2 Meteorological Data

In accordance with DA29/95, PA 08_0111 and EPL 416, Austar operate and maintain a meteorological station located at the CHPP (**Plan 2**). The following section summarises the meteorological data for the 2018-19 reporting period.

### 6.2.1 Rainfall

The total monthly rainfall and number of rain days during the reporting period is shown in **Table 6-2** and **Figure 6-1**. A total rainfall of 437mm was recorded during the 2018-19 reporting period. This represents an increase 74mm from the previous reporting period, however is still significantly under the annual average rainfall for the Cessnock area (734mm) (Bureau of Meteorology Cessnock Airport AWS 1968 - 2019).

**TABLE 6-2 RECORDED RAINFALL 2018-19**

| Total Monthly Rainfall (mm) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Total** |
| 1.6 | 10.0 | 36.4 | 61.0 | 48 | 68 | 27.6 | 35.8 | 100.2 | 10.2 | 12.6 | 25.9 | **437** |
| **Number of Rain Days (>0.2mm)** | | | | | | | | | | | | |
| 1 | 3 | 10 | 13 | 9 | 9 | 4 | 8 | 10 | 5 | 4 | 8 | **84** |

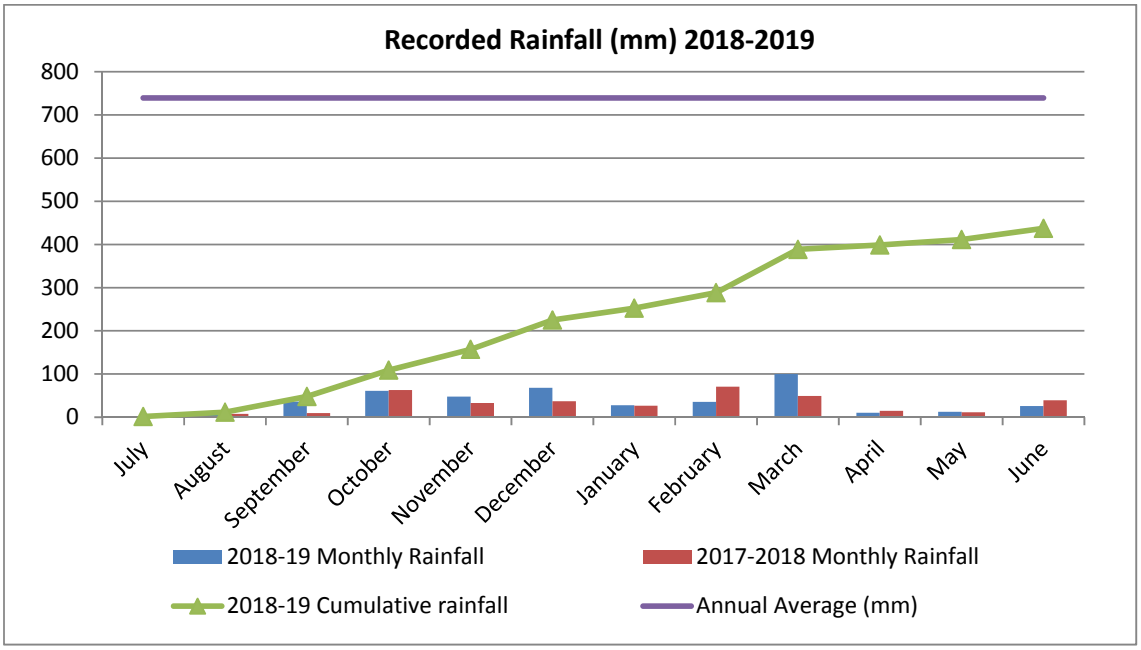


**FIGURE 6-1 RECORDED RAINFALL (MM) AT AUSTAR METEOROLOGICAL STATION 2018-19**

### 6.2.2 Temperature

Monthly maximum and minimum temperatures recorded during the reporting period are shown in **Table 6-3**.

**TABLE 6-3 MONTHLY MINIMUM AND MAXIMUM TEMPERATURES, 2018-19**

| Minimum and Maximum Monthly Temperatures (°C) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| Min | -3.2 | -0.3 | 3.7 | 6.0 | 10.1 | 11.8 | 42.2 | 12.2 | 10.5 | 6.2 | 1.2 | 2.8 |
| Max | 23.9 | 23.9 | 31.6 | 32.9 | 38.3 | 39.6 | 18.4 | 39.7 | 37.1 | 31.9 | 25.4 | 24.1 |

### 6.2.3 Wind Speed

The recorded wind speed and direction data is summarised in **Table 6-4**. The annual wind rose for the reporting period is displayed in **Figure 6-2**.

**TABLE 6-4 MEAN MONTHLY WIND SPEED**

| Month | Mean Wind Speed (m/s) | Maximum Wind Speed (m/s) | Dominant Wind Direction |
|---|---|---|---|
| **July 2018** | 0.4 | 16.1 | WSW |
| **August 2018** | 0.6 | 16.1 | WSW |
| **September 2018** | 0.6 | 14.3 | SW |
| **October 2018** | 0.7 | 14.3 | E |
| **November 2018** | 0.9 | 17.9 | E |
| **December 2018** | 0.7 | 16.1 | E |
| **January 2019** | 0.6 | 11.6 | E |
| **February 2019** | 0.7 | 13 | E |
| **March 2019** | 0.6 | 13.9 | E |
| **April 2019** | 0.4 | 11.2 | SW |
| **May 2019** | 0.5 | 15.6 | WSW |
| **June 2019** | 0.9 | 15.6 | SW |

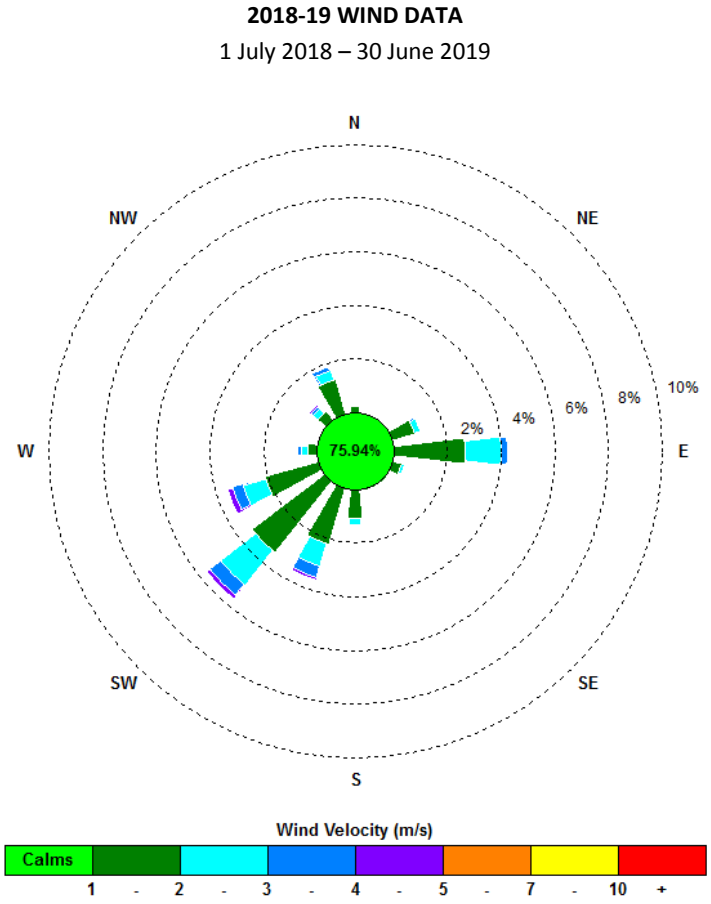


**FIGURE 6-2 MONTHLY AVERAGE WIND ROSE 2018-2019**

## 6.3 Air Quality

### 6.3.1 Environmental Management

Austar operates an Air Quality and Greenhouse Gas Management Plan (AQGGMP) for the Mine Complex to meet the requirements of PA08_0111 (specifically Schedule 4 Conditions 6 and 7), DA 29/95 and EPL 416. This Plan was recently updated in June 2018 and approved by DPIE on 1 August 2018.

Dust generated from traffic around the CHPP, Pit Top, workshop areas, access roads and reject emplacement areas is controlled by a water cart during active use of these areas. Generally, the majority of the site is stable, and does not generate excessive dust.

The AQGGMP was implemented by Austar and utilises eight dust depositional gauges, three high volume air samplers (HVAS) and one continuous dust monitor (TEOM). The HVAS and TEOM measure for particulate matter less than 10 micrometres (<=10µm), more commonly referred to as $PM_{10}$. Total Suspended Particulates (TSP) is not directly measured but calculated per the methodology outlined in the AQGGMP. The location of Austar's air quality monitoring equipment is listed in **Table 6-5** and shown on **Plan 2**.

**TABLE 6-5 LOCATION OF AIR QUALITY MONITORING POINTS**

| ID | Location | Monitoring Equipment |
|---|---|---|
| D1 | Pyne Way, Mount View | DDG, HVAS |
| D2 | Ellalong Road, Pelton Village | DDG, HVAS |
| D3 | Bimbadeen Road, Mount View | DDG |
| D4 | Ellalong Village | DDG |
| D5 | South of No 3 shaft upcast ventilation shaft | DDG |
| D6 | Bimbadeen Road, Mount View | TEOM |
| D7 | Pelton Fire Trail, Quorrobolong | DDG |
| D8 | Coney Creek Lane, Quorrobolong | DDG, HVAS |
| D9 | Kitchener Village | DDG |
| Met Station | CHPP site, Pelton | Meteorological Station |

### 6.3.2 Environmental Performance

During the reporting period, all dust samples were collected by trained specialists and analysed by NATA certified laboratories. This work is carried out in accordance with statutory requirements and relevant standards. Monitoring equipment is maintained in accordance with the manufacturer's specifications by qualified specialists. Dust deposition results and $PM_{10}$ monitoring data for the reporting period is provided below.

#### 6.3.2.1 Dust Deposition

**Table 6-6** provides a summary of Austar's deposited dust gauge annual average results for insoluble solids during the reporting period, previous reporting periods and against assessment criteria and environmental assessment predictions.

**TABLE 6-6 DEPOSITED DUST GAUGES ANNUAL AVERAGE COMPARED TO PREDICTIONS AND RESULTS OF PREVIOUS YEARS**

| ID | Location | EA Prediction Background Levels – Annual Average ($g/m^2$/ month) | Assessment Criteria | Annual Average Insoluble Solids ($g/m^2$/month) | | | | | Change in Deposited Dust 2017-18 to 2018-19 Period ($g/m^2$/ month) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | |
| D1 | Pyne Way, Mount View | 0.2 – 2.7* | 4 $g/m^2$ /month (maximum total deposited dust level)<br>2 $g/m^2$ /month (maximum annual increase in deposited dust level) | 1.0 | 0.9 | 0.8 | 0.9 | 1.2 | 0.3 |
| D2 | Ellalong Road, Pelton Village | 0.2 – 2.7* | | 1.5 | 1.4 | 1.4 | 1.1 | 1.5 | 0.4 |
| D3 | Bimbadeen Road, Mount View | 0.2 – 2.7* | | 1.2 | 0.9 | 1.1 | 0.7 | 0.8 | 0.1 |
| D4 | Ellalong Village | n/a | | 2.4 | 2.7 | 1.6 | 1.6 | 1.4 | -0.2 |
| D5 | Kalingo Infrastructure Area (Upcast Shaft 3) | n/a | | 2.3 | 3.3 | 1.5 | 0.7 | 1.8 | 1.1 |
| D7 | Pelton Fire Trail, Quorrobolong | 1.5 – 1.65^ | | 0.7 | 0.9 | 0.9 | 1.2 | 1.1 | -0.1 |
| D8 | Coney Creek Lane, Quorrobolong | 1.5 – 1.63^ | | 0.8 | 0.6 | 0.9 | 0.9 | 0.7 | -0.2 |
| D9 | Kitchener Village | n/a | | 0.9 | 0.9 | 0.8 | 1.3 | 0.9 | -0.4 |

***Note:*** *Deposited Dust is assessed as insoluble solids as defined by Standards Australia, 2003 AS3580.10.1 -2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method.*

** Bellbird South EIS (1995)*

*^ Proposed Stage 3 Extension Environmental Assessment (Appendix 17) (Umwelt, October 2008)*

Depositional dust results during the reporting period were all below the annual average criteria of 4g/$m^2$/month for insoluble solids. Overall dust results were generally similar to the 2017-18 reporting year as shown in **Table 6-6**. The maximum increase of recorded annual average insoluble solids at any one location from last reporting period to this reporting period was 1.1g/$m^2$/month at dust monitor D5 near the Kalingo Infrastructure area.

Dust results for the reporting period are consistent with 1995 Environmental Impact Statement (EIS) predictions. Section 4.7.2 of the 1995 EIS states that historical dust depositional data since 1991 ranges between 0.2 to 2.7 g/m$^2$/month.

There were seven (7) instances when the monthly dust deposition gauges were contaminated with bird droppings, insects or vegetative matter, and these results were left out of the annual average calculation. No gauge was deemed contaminated more than once in this reporting period. Works undertaken during previous reporting periods to reduce the contamination issue at D5 appear to be successful throughout this reporting period.

#### 6.3.2.2 Particulate Matter - $PM_{10}$

The HVAS units continued to operate on a six-day cycle (in line with the OEH cycle) during the reporting period. The annual average $PM_{10}$ and TSP results for the reporting period are all well below the annual average criteria at all monitoring locations, as shown in **Table 6-7**. 24 hour maximum $PM_{10}$ results for the reporting period are typically well below the 24-hour maximum although there have been a number of elevated results above 24 hour maximum criteria, which have not been attributable to Austar's operations. These elevated results are discussed in **Section 6.3.2.5**.

**TABLE 6-7 AIR QUALITY CRITERIA FOR PARTICULATE MATTER**

| Description | Pollutant | Averaging Period | Monitor | Criterion (µg/m$^3$) | Measured Result 2017-18 (µg/m$^3$) | Measured Result 2018-19 |
|---|---|---|---|---|---|---|
| Long Term Impact Assessment Criteria for Particulate Matter | Total Suspended Particulate (TSP) matter | Annual Average | TEOM | 90 | 28.5 | 33.4 |
| | | | HVAS1 | | 32.0 | 42.8 |
| | | | HVAS2 | | 39.4 | 47.7 |
| | | | HVAS3 | | 29.5 | 39.0 |
| | Particulate Matter < 10µm ($PM_{10}$) | Annual Average | TEOM | 30 | 11.4 | 13.4 |
| | | | HVAS1 | | 12.8 | 17.1 |
| | | | HVAS2 | | 18.8 | 19.1 |
| | | | HVAS3 | | 11.8 | 15.6 |
| Short Term Impact Assessment Criterion for Particulate Matter | Particulate Matter < 10µm ($PM_{10}$) | 24 hour Maximum | TEOM | 50 | 47.5 | 132 |
| | | | HVAS1 | | 38 | 56 |
| | | | HVAS2 | | 50 | 57 |
| | | | HVAS3 | | 31 | 55 |

***Note:*** *Methods for sampling and analysis of ambient air as defined by Standards Australia, AS 3580.9.6 -2003: Determination of suspended particulate matter—PM10 high volume sampler with size selective inlet—Gravimetric method.*

Annual Average $PM_{10}$ results are slightly higher than the previous reporting period for all monitoring locations, as shown in **Table 6-8**. Operations have not changed in these periods and the increase has been attributed to the sustained lower rainfall received over the last three reporting periods. All results remain well below the $PM_{10}$ Annual Average Criterion of 30 µg/m$^3$.

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**TABLE 6-8 $PM_{10}$ HVAS AND TEOM RESULT ANNUAL AVERAGES FOR CURRENT AND PREVIOUS YEARS**

| ID | Location | Annual Average $PM_{10}$ (µg/m$^3$) | | | | | |
|---|---|---|---|---|---|---|---|
| | | EA Prediction | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
| TEOM | Bimbadeen Road, Mount View | n/a | - | 9.5 | 10.1 | 11.4 | 13.4 |
| HVAS1 | Pyne Way, Mount View | n/a | 11.1 | 11.0 | 11.2 | 12.8 | 17.1 |
| HVAS2 | Ellalong Road, Pelton Village | n/a | 11.9 | 12.5 | 12.0 | 15.8 | 19.1 |
| HVAS3 | Coney Creek Lane, Quorrobolong | 42.07 | 10.8 | 9.6 | 9.8 | 11.8 | 15.6 |

#### 6.3.2.3 $PM_{10}$ (Fine Dust) Continuous Dust Monitoring

A Tapered Element Oscillating Microbalance (TEOM) monitor which measures $PM_{10}$ on a real-time continuous basis is located at monitoring site D6 to the northeast of the CHPP. This was installed in May 2015. 24 hour maximum results for the reporting period and graphical representation of the running and cumulative average of $PM_{10}$ results are provided in Error! Reference source not found., **Table 6-7** and **Table 6-8**. The annual average $PM_{10}$ result for the 2018-19 reporting period was 13.4µg/m$^3$, well below the $PM_{10}$ Annual Average Criterion of 30 µg/m$^3$ and similar to previous years.

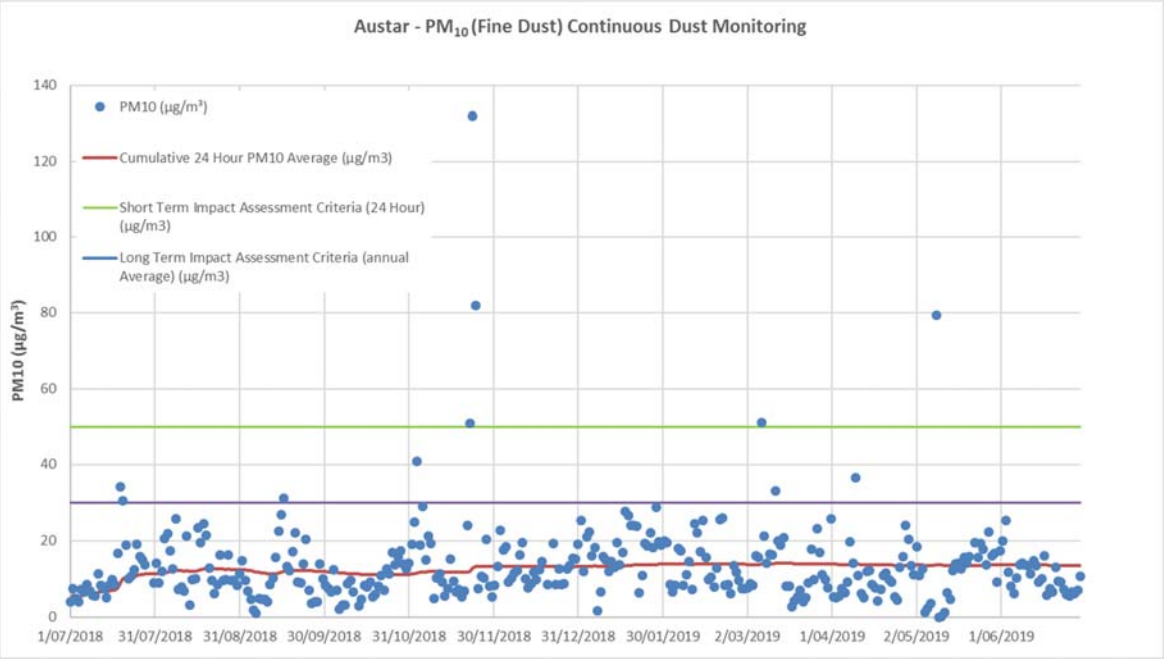



**FIGURE 6-3 AUSTAR TEOM $PM_{10}$ CONTINUOUS DUST MONITORING 2018-19**

#### 6.3.2.4 Total Suspended Particulates

The annual average TSP results for the reporting period are provided in **Table 6-9**.

**TABLE 6-9 TSP HVAS AND TEOM RESULT ANNUAL AVERAGES FOR CURRENT AND PREVIOUS YEARS**

| ID | Location | Annual Average TSP (µg/m³) | | | | | |
|---|---|---|---|---|---|---|---|
| | | EA Prediction | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 |
| TEOM | Bimbadeen Road, Mount View | n/a | 15.8* | 23.8 | 25.3 | 28.5 | 33.4 |
| HVAS1 | Pyne Way, Mount View | n/a | 27.8 | 27.5 | 28.0 | 32.0 | 42.8 |
| HVAS2 | Ellalong Road, Pelton Village | n/a | 29.8 | 31.3 | 30.0 | 39.4 | 47.7 |
| HVAS3 | Coney Creek Lane, Quorrobolong | 32.53 | 27.0 | 24.1 | 24.5 | 29.5 | 39.0 |

** TEOM installed March 2015 so annual average is incomplete*

The current project average for calculated Total Suspended Particulates (TSP) at all monitoring locations is well below the annual average criterion of 90µg/m$^3$. The TSP is calculated by multiplying the $PM_{10}$ result by 2.5 in accordance with the method outlined in the AQGGMP.

#### 6.3.2.5 Elevated result investigations

Schedule 4 condition 4 of PA08_0111 and Schedule 3 Condition 17 of DA 29/95 state that Austar must ensure that dust emissions generated by Austar's operations do not cause additional exceedances of the air quality impact assessment criteria in the relevant EA's.

During the reporting period there were three elevated results reported to the DPIE relating to air quality. These are discussed below:

On the 18 July 2018, HVAS3 recorded a monitored result of 55 µg/m$^3$, which exceeded the 24-hour average $PM_{10}$ criterion of 50 µg/m$^3$ specified in PA08_0111 (MOD3) Schedule 4, Condition 4 and DA29/95 (MOD7) Schedule 3 Condition 17. HVAS3 is located on Coney Creek Lane, Quorrobolong in a rural area. The nearest Austar Coal Mine operations are Kitchener Surface Infrastructure Site located >950m to the north west, and Kalingo Infrastructure Area located >3.1km to the WSW of the monitoring location. Both infrastructure sites are currently well vegetated, with minimal exposed soils.

This event was fully investigated and was reported to the DPIE.

NSW Office of Environment & Heritage (OEH) published a media release on 19 July 2018 which stated:

*An Office of Environment and Heritage spokesperson said:*

> *"On Wednesday morning (18 July 2018), there was a moderate dust storm occurring over inland NSW, with additional dust transported to the east/northeast over Illawarra, Sydney basin and further north, leading to increase in $PM_{10}$ levels over these regions. The $PM_{10}$ exceedance over the Upper Hunter region was related to this event.*

No further actions were required in relation to this elevated result.

A second regional dust event occurred on the 21, 22 and 23 November 2018. The TEOM recorded a monitored result of 50.8µg/m$^3$ for 21 November 2018, 131.9µg/m$^3$ for 22 November 2018, and 81.9µg/m$^3$ for 23 November 2018. All three results exceeded the 24-hour average $PM_{10}$ criterion of 50µg/m$^3$ specified in PA08_0111 (MOD3) Schedule 4, Condition 4 and DA29/95 (MOD7) Schedule 3 Condition 17. On 21 November 2018 HVAS1 recorded a monitored result of 56µg/m$^3$ and HVAS2 recorded a monitored result of 57µg/m$^3$.

Austar Coal Mine had minimal operations occurring over this period, with only four hours of conveyor operation over the three days, and no trains or reject haulage undertaken. Given the limited operations, the predominant wind direction and high regional dust levels observed during the exceedance period from a severe dust storm in NSW, it is not likely that airborne

dust from Austar Coal Mine was the cause of the elevated $PM_{10}$ results. Austar Coal Mine had minimal contribution to the recorded dust levels.

Thirdly, the TEOM recorded an elevated result of 51.0µg/$m^3$ on the 6 March 2019. Conditions were dry with gusty winds, and several external sources of dust influenced the result, including a significant bushfire in Werakata National Park and operations at a residential subdivision adjacent to the TEOM. No further actions were required as a result of this elevated reading.

The cause of these elevated results have been identified and were predominantly attributable to regional dust events and local bushfires, not Austar's operations. In accordance with the relevant project approval conditions, no non-compliances have been logged in relation to these elevated results.

## 6.4 Biodiversity

### 6.4.1 Environmental Management

***Stage 2 Mining Area***

Schedule 3, Condition 23(c) of DA 29/95 requires monitoring of riparian vegetation in areas above Longwalls A3 to A5a for subsidence impacts. Monitoring was to be undertaken for five years, then reviewed to see if further monitoring of riparian vegetation was required.

Baseline monitoring was undertaken in 2008 and 2009, followed by regular monitoring between 2009-2017 comparing the results to baseline and assessing whether there was any harm due to subsidence. No harm due to subsidence was recorded. Mining was completed in this area in 2013. During this reporting period, OEH confirmed their satisfaction that there has been no harm due to subsidence, and that the requirements of Schedule 3, Condition 23(c) have been met. No further monitoring will be undertaken in this area.

***Stage 3***

The Stage 3 EA (Umwelt, October 2008) states:

*Subsidence impacts are not expected to have a significant impact on the ecology or ecological communities of the proposed Stage 3 mining area. In addition, due to the depth of cover and relative predicted uniformity of subsidence over the Project area, it is predicted that surface mitigation works along creeks and drainage channels will not be required and hence disturbance of these areas is not likely to be necessary.*

*Mining of the Project area is not expected to significantly impact on runoff regimes, bank stability, channel alignment, in-channel and out of channel ponding or groundwater availability. Drainage line*

*analysis of the predicted subsided landform indicates that all creek systems will remain free draining without mitigation works.*

The EA did not propose any management, mitigation or monitoring measures in relation to biodiversity.

Much of the Stage 3 Extraction Plan area (LWA7-LWA10) comprises the Lower Hunter Spotted Gum – Ironbark Forest and Derived Grassland with Scattered Canopy Trees vegetation communities. The Riparian Red Gum Forest within the Stage 3 Mining Area (refer to **Figure 6-4**) was found to broadly align with the description of the *Threatened Species Conservation Act 1995* listed River-flat Eucalypt Forest Endangered Ecological Community (EEC).

Ecological monitoring was undertaken in Spring 2018 and Autumn 2019 for the Stage 3 mining area. The Stage 3 monitoring surveys are a continuation of baseline monitoring established in 2012 and are carried out in accordance with the Biodiversity Management Plan (Umwelt 2013) and the Stage 3 Extraction Plan Biodiversity Management Plan (Umwelt 2013).

***Bellbird South Mining Area***

The LWB1-LWB3 Environmental Assessment (Umwelt, November 2015) states:

*Biodiversity values have the potential to be impacted by subsidence related surface cracking in the soil, and by any associated remediation of surface cracking post mining. Secondary impacts associated with hydrological changes are also possible and typically impact greatest on riparian areas*.

*Based on the subsidence and groundwater assessments, the potential for biodiversity impacts is regarded as low, although a monitoring program is recommended.*

The LWB4-B7 Environmental Assessment (Umwelt, May 2017) states:

*While there is not predicted to be any significant adverse impact to ecological features within the LWB4-B7 Modification Area and subsidence remediation is not expected to be required, the BMP will include contingency measures for subsidence remediation works in the unlikely event that subsidence remediation works are required.*

The ecological monitoring program in the LWB1-LWB7 area targets significant vegetation communities in the Bellbird South Mining Area including Lower Hunter Spotted Gum – Ironbark Forest EEC, River-flat Eucalypt Forest EEC and potential Quorrobolong Scribbly Gum Woodland EEC (refer **Figure 6-5**).

Ecological monitoring was undertaken in Spring 2017 and Autumn 2018 for the Bellbird South mining area. The LWB1-B7 monitoring surveys are a requirement of, and are carried out in accordance with the Biodiversity Management Plan (BMP) (LWB1-B7) (Umwelt 2017). During the reporting period, the

Biodiversity Management Plan was updated to reflect the shortening of LWB4. Monitoring in Autumn was undertaken against the revised Biodiversity Management Plan (February 2019).

The objectives of the ecological monitoring programs are to determine if there is any change in flora and habitat condition as a consequence of mining and associated subsidence.

### 6.4.2 Environmental Performance

***Stage 3 Mining Area***

Mining last occurred in the Stage 3 Area in June 2015. No recommendations have been made for the Stage 3 monitoring sites for the Spring 2018 and Autumn 2019 surveys, as no observable impacts as a result of longwall mining were recorded.

Floristic diversity in the Spring 2018 monitoring was higher than previous years, probably due to higher than usual rainfall just prior to the monitoring program. The Autumn monitoring program confirmed that vegetation is stable and in good health despite the ongoing drought conditions, with no impacts attributable to Longwall Mining in the monitoring area.

***Bellbird South Mining Area***

Monitoring in the Bellbird south area confirms vegetation is stable and in a good state of health despite the drought affected state of the region. There are no mining related impacts evident at any of the monitoring locations, the spotted gum – Ironbark forest endangered ecological community (NSW Biodiversity Conservation Act 2016 (BC Act)), the River Flat Eucalypt Forest EEC (BC Act) or the vulnerable heath wrinklewort (BC Act and Environmental Protection and Biodiversity Conservation Act).

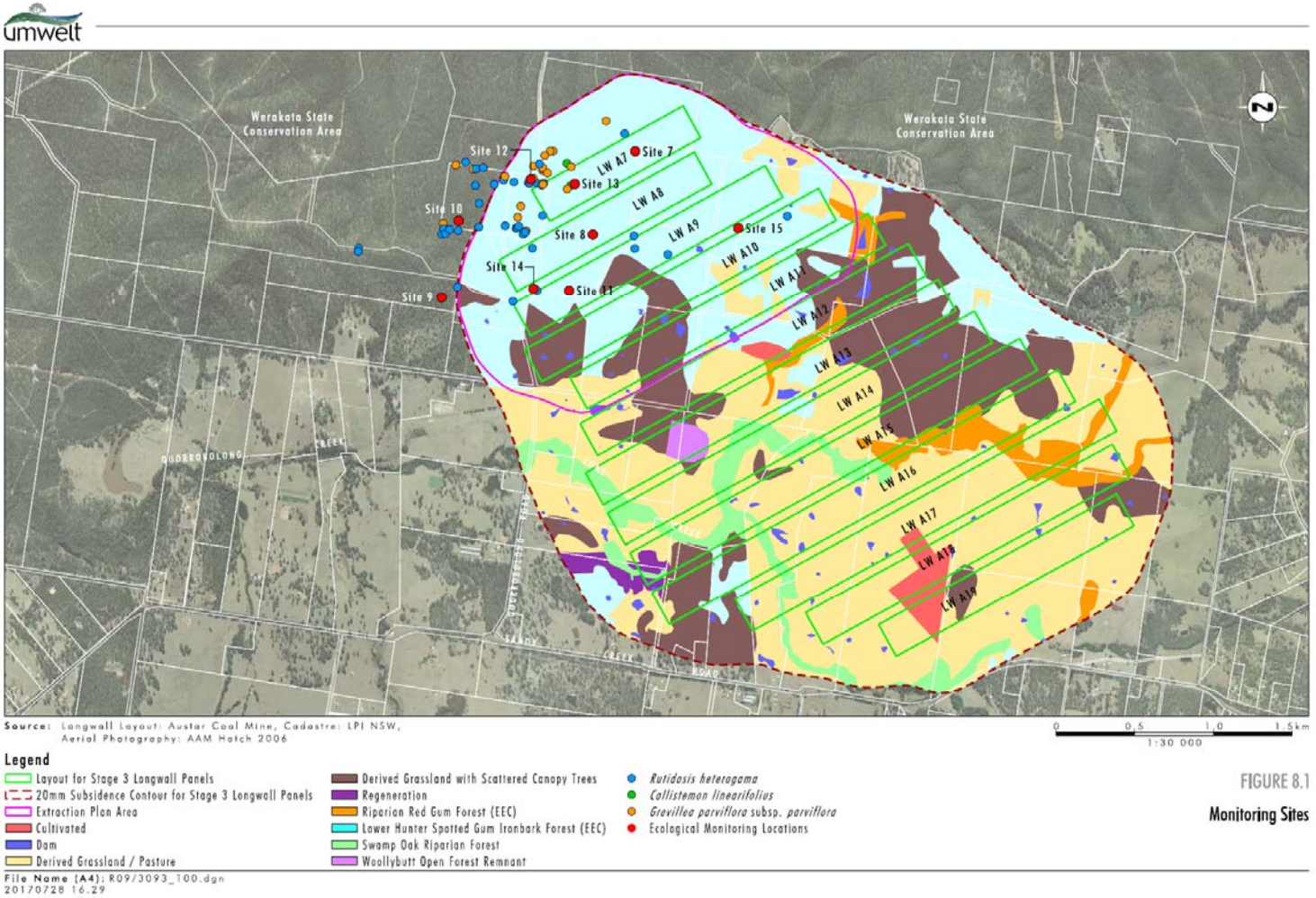



**FIGURE 6-4 LOCATION OF STAGE 3 ECOLOGICAL MONITORING SITES**

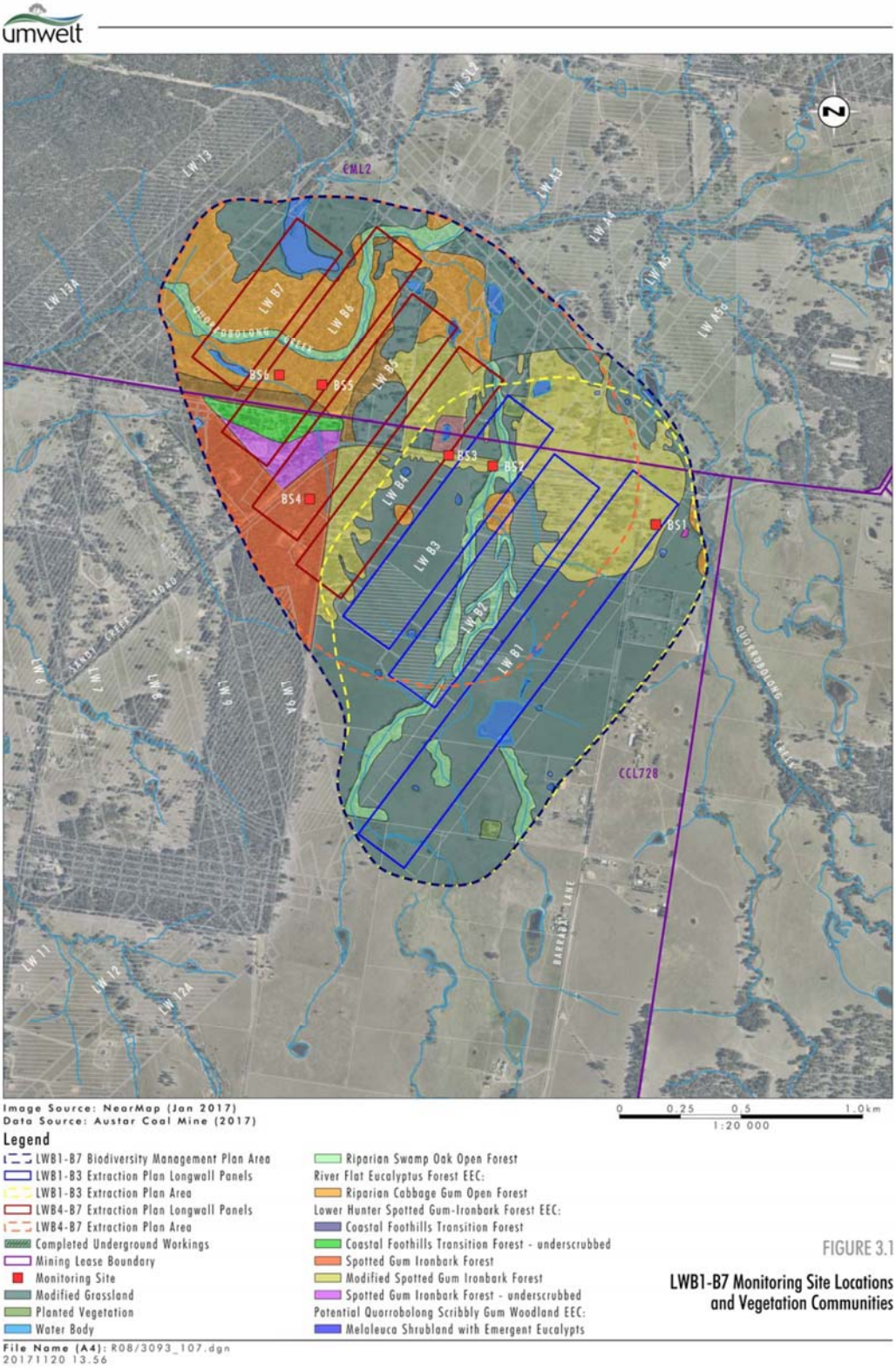



**FIGURE 6-5 LOCATION OF LWB1-B7 ECOLOGICAL MONITORING SITES**

## 6.5 Vibration and Blasting

### 6.5.1 Environmental Management

Austar operates a Noise and Vibration Management Plan (NVMP) prepared in accordance with the requirements of PA08_0111, DA 29/95. This plan was recently updated in June 2018 and approved by DPIE on 1 August 2018. The location of vibration monitors is shown on **Plan 2**.

Austar have continued to undertake vibration monitoring in the Stage 3 area with a vibration monitor located at 345 Quorrobolong Road, Quorrobolong (V7). There was no mining in the Stage 3 area during the reporting period, and only one minor vibration event has been recorded on this monitor since mining commenced in Bellbird South. Monitors V10 and V11 are within the Bellbird South mining area, where operations have occurred during this reporting period.

There are no impact assessment criteria in Austar's Environmental Assessments, so the NVMP refers to a DECC guideline - *Assessing Vibration: A Technical Guideline* (DECC, February 2006) which provides day- and night-time preferred and maximum vibration values for different receiver types such as residences, offices, workshops, and critical work areas (hospital operating theatres, precision laboratories). The guideline indicates that the criteria are non-mandatory and are goals that should be sought to be achieved through the application of all feasible and reasonable mitigation measures. In the case of longwall mining, there is limited scope for mitigation measures. The NVMP also refers to a British Standard (BS 7385 Part 2-1993 'Evaluation and Measurement for Vibration in Buildings Part') in relation to potential risk of cosmetic damage to buildings.

### 6.5.2 Environmental Performance

In accordance with the NVMP, vibration monitors are set to trigger and record an event when vibration is greater than 1mm/second. Vibration monitoring results are presented in **Figure 6-6** and **Figure 6-7**.

Monitoring undertaken in previous reporting periods has indicated vibration in the mining area is event based, and normally occurs when the longwall equipment is extracting coal. Vibration is typically generated adjacent to the longwall mining area, or from tensile fractures in the overlying strata immediately above and surrounding the longwall mining area.

There were 25 events recorded in the 2018-19 reporting period (PVS >1mm/s), which is relatively consistent with the 21 vibration events in the 2017-18 reporting period and significantly less than the 85 vibration events in the 2016-17 reporting period. There were no complaints in regards to vibration.

The British Standard provides guideline values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated and where minimal risk of cosmetic damage may occur (15mm/s). The maximum recorded event for the current reporting period was 3.87mm/s, significantly less than the 15mm/s for minimal risk of cosmetic damage.

During the reporting period there were no day time vibration events that exceeded the day time preferred or maximum criteria. Two night time vibration events exceeded the preferred night time criteria. There were no events that exceeded the maximum night time criteria.

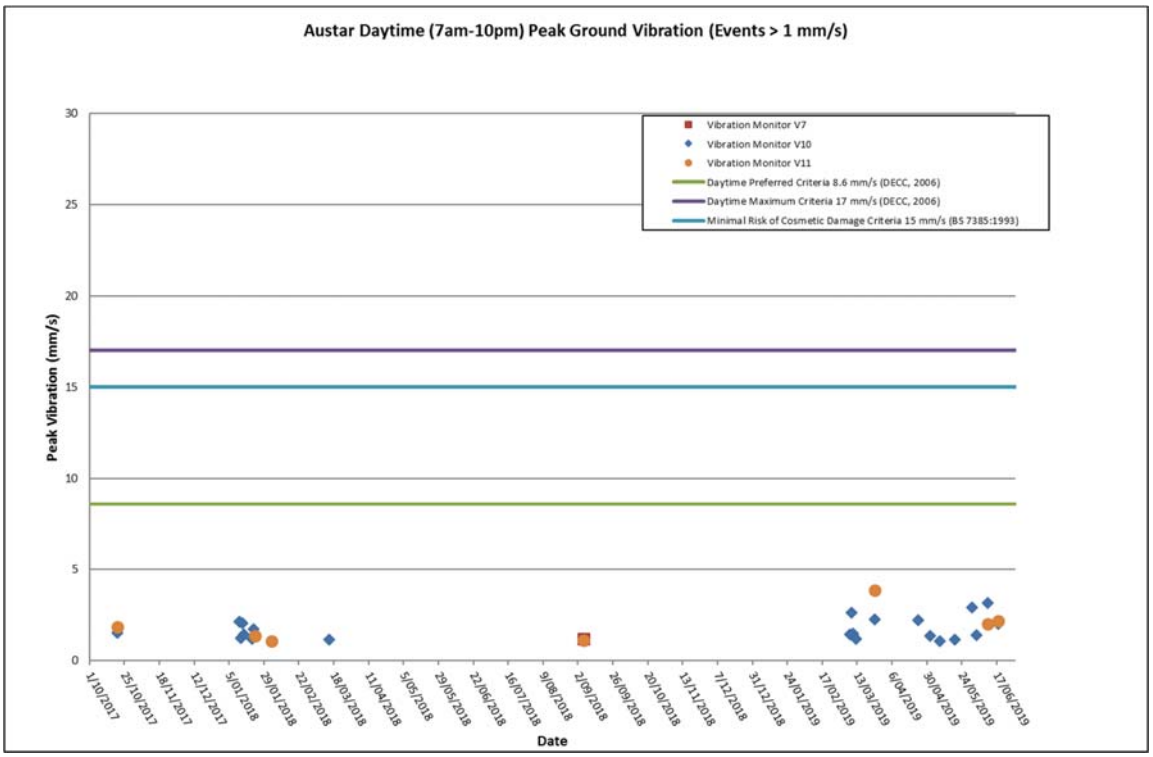



**FIGURE 6-6 DAY TIME GROUND VIBRATION EVENTS**

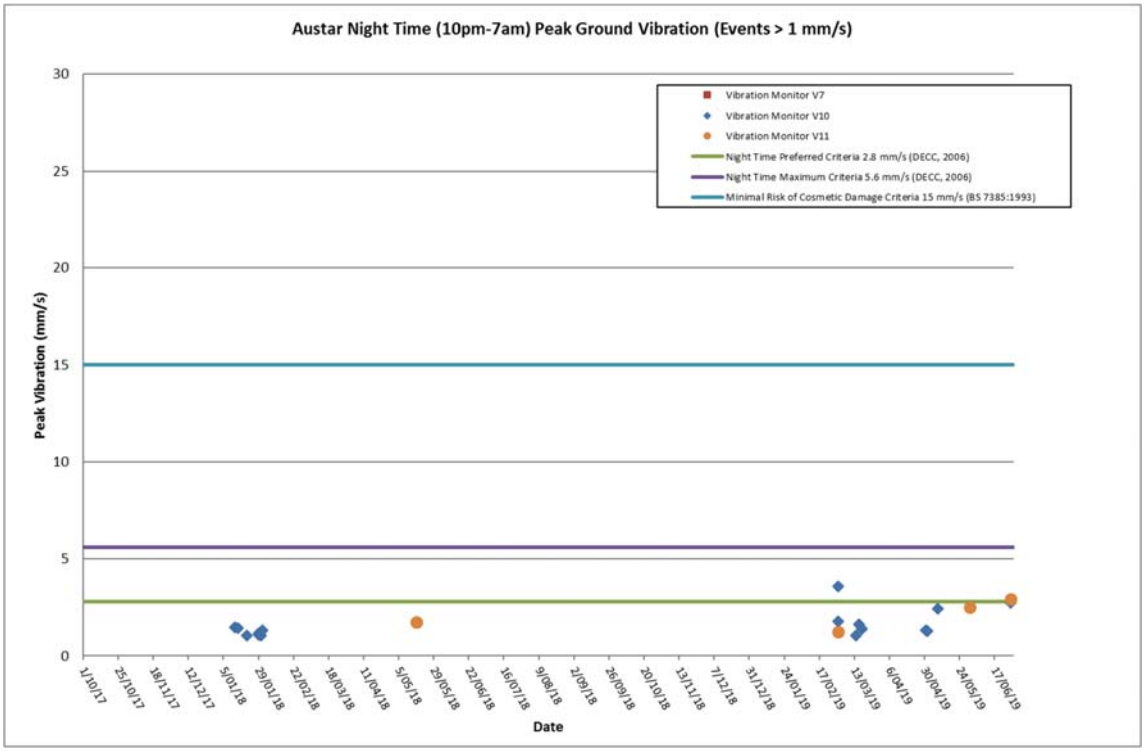



**FIGURE 6-7 NIGHT TIME GROUND VIBRATION EVENTS**

## 6.6 Noise

### 6.6.1 Environmental Management

Austar operates a Noise and Vibration Management Plan (NVMP) prepared in accordance with PA08_0111, DA 29/95 and EPL 416. This plan was recently updated in June 2018 and approved by DPIE on 1 August 2018.

Operational noise impacts are potentially greatest at night when background levels are typically low and the allowable levels are correspondingly low, and this is the period when noise propagation enhancement is most likely. Operational noise monitoring is conducted at night, in accordance with the NVMP.

Periodic noise monitoring is conducted monthly and reported quarterly in accordance with the NVMP by an independent noise consultant. There are seven key monitoring locations representative of surrounding receivers. Monitoring points have been selected as reference locations and form the basis for assessing and evaluating noise emissions from the operation. The locations are listed in **Table 6-10** and presented in **Plan 2**.

**TABLE 6-10 NOISE IMPACT ASSESSMENT CRITERIA AND GOALS**

| Receiver | Location | Receiver Description | Criteria/Goal |
|---|---|---|---|
| ***Nearest Potentially Affected Receivers to CHPP (EPL 416)*** | | | |
| **C1** | South of Bimbadeen Road, Mt View | West of CHPP | $L_{A90}$ 40 dB |
| **C2** | Pelton Village | South East of CHPP | $L_{A90}$ 43 dB |
| **C3** | Bimbadeen Road, Mt View | North-west of CHPP | $L_{A90}$ 37 dB |
| ***Nearest Potentially Affected Receivers to Kitchener Surface Infrastructure Site (PA08_0111)*** | | | |
| **K1** | Pelton Road, Quorrobolong | South of SIS | $L_{Aeq}$ 35 dB / $L_{A1}$ 45 dB |
| **K2** | Coney Creek Lane, Quorrobolong | East of SIS | $L_{Aeq}$ 35 dB / $L_{A1}$ 45 dB |
| **K3** | Richmond Street, Kitchener | North of SIS | $L_{Aeq}$ 35 dB / $L_{A1}$ 45 dB |
| ***Nearest Potentially Affected Receivers to Kalingo Infrastructure Area (DA29/95)*** | | | |
| **K4** | Nash Lane, Quorrobolong | East of Kalingo Infrastructure Area | $L_{Aeq}$ 35 dB |

### 6.6.2 Environmental Performance

A summary of results from attended noise monitoring undertaken during the 2018-19 reporting period is provided in **Table 6-11,** and **Table 6-12**.

Monitoring during this reporting period was undertaken in accordance with this NVMP, and all results were within compliance criteria, with the exception of recorded exceedances at monitoring locations C2 and C3 on one night in June 2019.

**TABLE 6-11 NOISE GENERATED BY THE AUSTAR CHPP AGAINST PROJECT CRITERIA**

| Quarter | Period | Austar CHPP Only $L_{A90\ (15min)}$ (dB) | | |
|---|---|---|---|---|
| | | C1 | C2 | C3 |
| | Noise Criteria | 40 | 43 | 37 |
| **Q3 2018** | Night | <20 | <20 | NM |
| | | <30 | 32 | IA |
| | | <25 | IA | IA |
| **Q4 2018** | Night | <25 | IA | <25 |
| | | IA | IA | <20 |
| | | <20 | IA | <20 |
| **Q1 2019** | Night | 35 | 36 | <30 |
| | | 37 | 31 | 33 |
| | | <25 | 41 | <25 |
| **Q2 2019** | Night | 30 | 32 | 27 |

| Quarter | Period | Austar CHPP Only $L_{A90\ (15min)}$ (dB) | | |
|---|---|---|---|---|
| | | C1 | C2 | C3 |
| | Noise Criteria | 40 | 43 | 37 |
| | | 36 | 38 | 37 |
| | | **39/44** | <30 | **40/45** |

*NM – Not measurable*

*IA – Inaudible*

*Bold indicates an exceedance of criteria. Measured level is followed by the final result after the application of low frequency modifying factors*

*These are results for Austar CHPP in the absence of all other noise sources.*

**TABLE 6-12 NOISE GENERATED BY KITCHENER SIS AGAINST SPECIFIC PROJECT CRITERIA**

| Quarter | Period | Kitchener SIS Only $L_{Aeq,\ 15\ min}$ (dB) | | | Kitchener SIS Only, $L_{A1\ (1min)}$ | | |
|---|---|---|---|---|---|---|---|
| | | K1 | K2 | K3 | K1 | K2 | K3 |
| | Noise Criteria | 35 | 35 | 35 | 45 | 45 | 45 |
| **Q3 2018** | Night | <30 | <25 | IA | <30 | <25 | IA |
| | | 29 | <25 | <25 | 32 | <30 | <25 |
| | | IA | IA | NM | IA | IA | NM |
| **Q4 2018** | Night | <25 | IA | <20 | <25 | IA | <20 |
| | | IA | IA | IA | IA | IA | IA |
| | | <25 | <20 | <20 | <25 | <20 | <20 |
| **Q1 2019** | Night | <20 | IA | IA | <20 | IA | IA |
| | | <25 | IA | IA | <25 | IA | IA |
| | | <20 | IA | IA | <20 | IA | IA |
| **Q2 2019** | Night | <20 | IA | IA | <20 | IA | IA |
| | | <30 | <25 | <25 | <30 | <25 | <25 |
| | | <20 | IA | IA | <20 | IA | IA |

**TABLE 6-13 NOISE GENERATED BY KALINGO INFRASTRUCTURE AREA AGAINST SPECIFIC PROJECT CRITERIA, SITE K4**

| Quarter | Period | Austar KIA Only $L_{Aeq, 15\ min}$ (dB) |
|---|---|---|
| | | Noise Criteria 35 |
| **Q3 2018** | Night | <30 |
| | | <25 |
| | | IA |
| **Q4 2018** | Night | <25 |
| | | IA |
| | | <20 |
| **Q1 2019** | Night | <25 |
| | | 25 |
| | | IA |
| **Q2 2019** | Night | 27 |
| | | <30 |
| | | 33 |

Austar complied with relevant noise limits during the 2018-19 reporting period, with the exception of noise criteria exceedances at C1 and C3 on 11 June 2019. At C1, the measured $L_{A90(15\ minute)}$ was within EPA noise limits at 39dB (compared to a noise limit of 40dB), however with the Noise Policy for Industry (NPfI) low frequency modifying factor, the assessable result is 44dB. At C3 the measured result was 40dB (compared to a noise limit of 37dB), with the application of the NPfI low frequency modifying factor the assessable result was 45dB.

Idling Locomotives, dozer tracks, and the conveyor were audible at both sites. Some enhancement of noise levels may have occurred due to weak inversion and wind conditions at the time of monitoring. Follow-up monitoring, in accordance with the NVMP, was compliant. This elevated result was fully investigated and reported to the EPA and DPIE.

**CHPP Noise Pollution Reduction Program**

Austar has been undertaking a voluntary noise pollution reduction program (PRP) in consultation with the EPA for many years.

A noise source investigation at the CHPP was undertaken in the previous reporting period. The investigation measured the noise contribution of various items of CHPP infrastructure to the acoustic environment around the site. The results of this investigation were used during this reporting period to further refine the Austar noise model. The ranking of noise sources was further analysed to confirm

fieldwork results and assist in identifying targeted mitigation for these sources. During the next reporting period, proposed mitigation will be modelled to assess potential reductions and determine reasonable and feasible mitigation outcomes.

## 6.7 Aboriginal Heritage

### 6.7.1 Environmental Management

Austar operates an Aboriginal Cultural Heritage Management Plan (ACHMP). This plan was recently updated in June 2018 and approved on 1 August 2019. The ACHMP provides a consolidated framework and process for managing Aboriginal cultural heritage responsibilities within the Austar Coal Mine in compliance with all Aboriginal cultural heritage management requirements under legislation, guidelines and existing consents

The Austar Coal ACHMP (2018) provides mechanisms for the management of activities undertaken by or on behalf of Austar that have the potential to impact cultural heritage. Section 5.3 of the ACHMP provides management measures for surface disturbance works and provides different strategies for areas subject to prior survey and those that have not been surveyed.

### 6.7.2 Environmental Performance

During the reporting period, Austar commenced planning to increase the size of the Strategic Fire Advantage Zone (SFAZ) at the Pit top facility in line with recommendations in the Bushfire Management Plan. In consultation with the Rural Fire Service (RFS) and as part of the bushfire hazard reduction certificate environmental approval process, an archaeological due diligence assessment was undertaken by a qualified archaeologist and a Registered Aboriginal Party representative.

The due diligence survey did not identify any Aboriginal archaeological objects and/or cultural material, or objects of potential historical heritage significance within the survey area.

The SFAZ extension may be undertaken during the next reporting period.

## 6.8 Mine Subsidence

### 6.8.1 Environmental Management

In accordance with PA08_0111 Schedule 3 Condition 4, and DA29/95 Schedule 3 Condition 3A, Austar is required to prepare and implement an Extraction Plan prior to the commencement of any second workings in their respective mining areas. During the reporting period, Austar predominantly operated under the Bellbird South LWB4-B7 Extraction Plan (approved 25 August 2017). During this reporting period, the Extraction Plan was revised and updated to reflect the shortening of LWB4. The revised extraction plan was approved on 12 February 2019. Other approved Extraction Plans can be found at austarcoalmine.com.au.

The predicted conventional subsidence parameters for the proposed longwalls have been obtained using the Incremental Profile Method. The subsidence model has been calibrated and reviewed using the available ground monitoring data above the previously extracted longwalls at Austar. The maximum predicted mine subsidence movements due to the extraction of the proposed Longwalls B4 to B7 are: 1,350 mm vertical subsidence; 5.5 mm/m tilt (i.e. 0.55 %, or 1 in 180); 0.05 km-1 hogging curvature (20 km minimum radius) and 0.06 km-1 sagging curvature (17 km minimum radius).

Subsidence monitoring for the Bellbird South LWB4-LWB7 area during the reporting period was completed in accordance with the Subsidence Monitoring Program which forms part of the Extraction Plan. Monitoring is conducted in affected areas pre-, during and post-mining on a fortnightly basis when the Longwall has approached within 100m of Sandy Creek Road and at the completion of each longwall. Access to the subsided area has been somewhat limited due to private landholder constraints during the reporting period so predicted vertical subsidence and tilt values for Sandy Creek Road (subsidence Line SCR1) from Table 6.1 of the Mine Subsidence Engineering Consultants (MSEC) report '*Austar Coal Mine: Longwalls B4 to B7 - Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Modification Application for Longwalls B4 to B7 at the Austar Coal Mine'* will be compared with the values measured along that line to assess changes to the area.

The overall framework for subsidence monitoring and management of impacts can be described as a subsidence monitoring program (actual measured subsidence, and inspections for environmental consequences of subsidence to compare against predicted impacts) which may trigger a response, or set of responses. The response is commensurate with the nature of the measurement or the impact which has been identified. The Extraction Plans for Bellbird South LWB1-B3 and LWB4-B7 rely on a set of individual management plans which are intended to address impacts to particular environmental or built features within the Extraction Plan areas.

### 6.8.2 Environmental Performance

During the reporting period, Austar extracted coal in Longwall LWB4 until 29 November 2018. Extraction in LWB5 commenced in January 2019 and will continue into the next reporting period.

Subsidence monitoring has been undertaken in accordance with the Subsidence Monitoring Program and as landholder access has permitted. The mine subsidence movements resulting from the extraction of Longwall LWB4 were monitored during the 2018-19 reporting period using Line SCR1 (Sandy Creek Road). The location of this monitoring line for the Bellbird South area is shown on **Figure 6-8**.

Subsidence monitoring results from the Bellbird South area have been consistently within the maximum predicted range along Line SCR1 as shown in the **Table 6-14**. A maximum of 508mm of vertical subsidence was recorded on Line SCR1, compared to the maximum predicted subsidence at this location on the completion of extraction of LWB3 of 850mm. This trend has continued after the commencement of LWB4, with a maximum measured subsidence of 453mm at the end of the current

reporting period, compared to a maximum predicted subsidence at the completion of LWB4 of 1,100mm.

Measured tilts and strains during the reporting period on Line SCR1 shows results well within values predicted by the MSEC report for Line SCR1, as shown in **Table 6-14**.

**TABLE 6-14 MAXIMUM PREDICTED AND MEASURED TOTAL VERTICAL SUBSIDENCE AND TILT FOR SANDY CREEK ROAD (LINE SCR1) 2018-19**

| Location | Longwall | Maximum Predicted Incremental Vertical Subsidence (mm) | Maximum Measured Incremental Vertical Subsidence (mm) | Maximum Predicted Incremental Tilt (mm/m) | Maximum Measured Incremental Tilt (mm/m) |
|---|---|---|---|---|---|
| SCR1 | LWB1-LWB3 | 850 | 508 | 2.5 | 2.2 |
| | LWB4 | 1,100 | 453 | 3.5 | 1.3 |
| | LWB5 | 1,250 | 268 | 3.5 | 2.0 |

*NB: Predicted Numbers are from Table 6.1 from the MSEC MOD 7 application for Longwalls B4 to B7 report*

Strain on Line SCR1 measures a maximum of 0.7mm/m for compressive strain and 1.9mm/m for tensile strain during the reporting period. These results are less than the predicted maximum strain for LWB4-LWB7 of 2.2mm/m for compressive strain and 1.7mm/m for tensile strain (99% confidence level from Table 4.6 from MSEC report).

The ground movements, measured along Line SCR1, indicate that the observed subsidence resulting from the extraction of Longwalls LWB2, LWB3 and LWB4 were generally similar to or less than the maximum predicted subsidence. The profiles of observed subsidence also reasonably matched those predicted, but with reduced magnitudes.

During subsidence monitoring inspections, there have been no perceptible impacts to the environment or increases in public safety risk. There were no abnormal overburden behaviours observed that required particular review.

No subsidence management actions were required to be undertaken as a result of extraction during the 2018-19 reporting period.

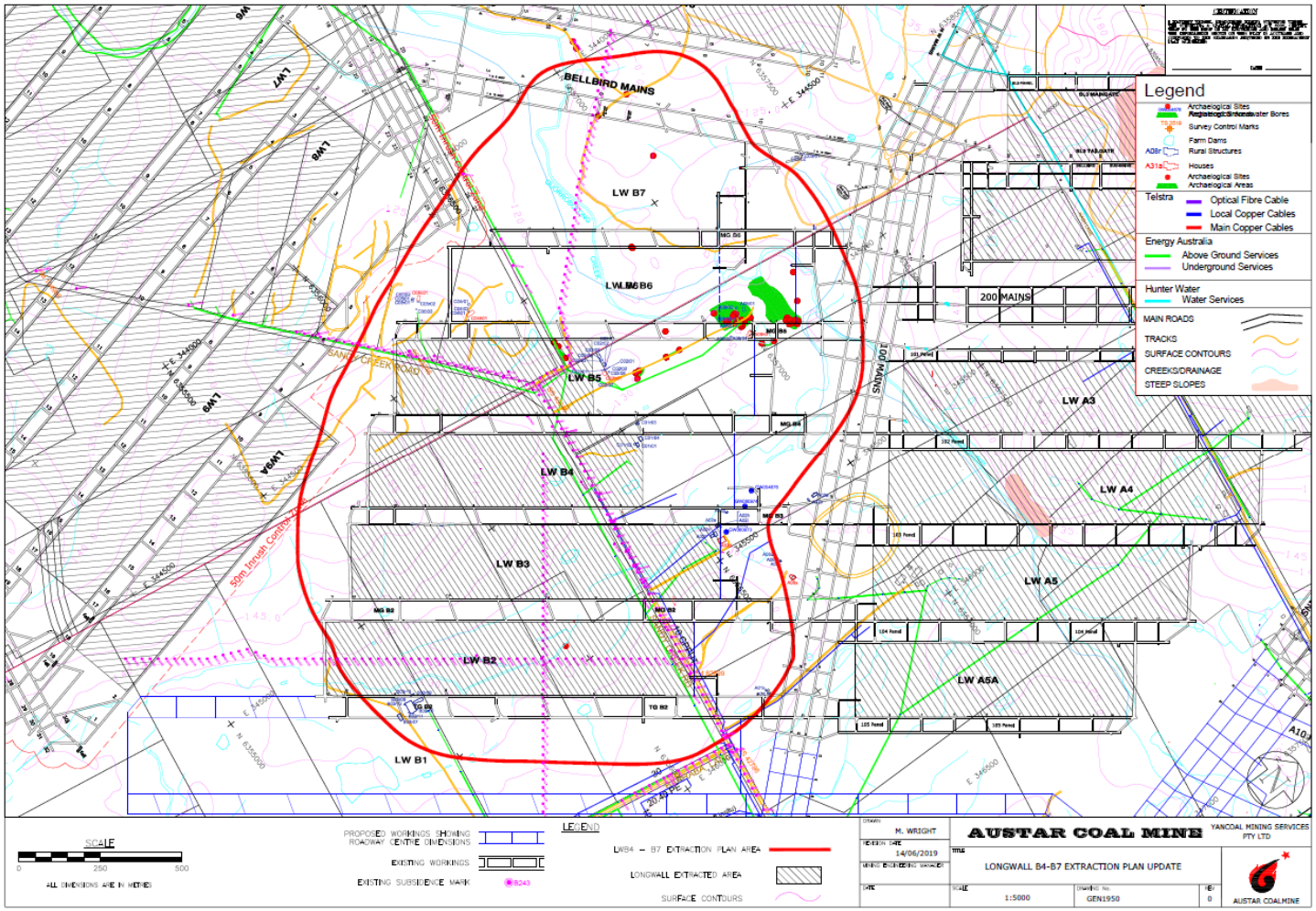



**FIGURE 6-8 SUBSIDENCE MONITORING SURVEY PLAN BELLBIRD SOUTH AREA**

# 7 WATER MANAGEMENT

Site water management at Austar is complex. The three main components of the water management system are the:

- Underground mine water management system;
- Pelton CHPP site water management system; and
- Surface water storage and management system.

Pelton CHPP site water management system includes a Reverse Osmosis water treatment plant, coal processing system, and stormwater runoff and management system. Treated water is used in the CHPP and underground, and may also be discharged into Bellbird Creek in accordance with EPL 416.

The groundwater management system is complex. There are a number of underground water storage areas, as outlined in the Site Water Management Plan (SWMP).

The surface water storage and management system is used to ensure the underground workings can be dewatered as required to allow for continual production, as well as manage surface water runoff during rain events and ensure adequate water supply for operations. Further information on site water management can be found in the approved SWMP on the Austar website.

## 7.1 Water Licences

#### 7.1.1.1 Water Licences

Austar holds water licences for monitoring and dewatering bores across the operation. Austar's current water licences issued under Part 5 of the Water Act 1912 and the Water Management Act 2000 are provided in **Table 7-1.**

**TABLE 7-1 WATER LICENCES HELD BY AUSTAR**

| Licence Held | Licence Number | Validity of Licence | Purpose of Licence | Extraction Limit |
|---|---|---|---|---|
| Bore Licence Certificate | 20BL171361 | 17 May 2007 - Perpetuity | Monitoring Bore (AQD1077) | N/A |
| Bore Licence Certificate | 20BL172524 | 20 July 2010 - Perpetuity | Monitoring Bore (NER1010) | N/A |
| Bore Licence Certificate | 20BL172852 | 7 June 2011 - Perpetuity | Monitoring Bore (WBH1, WBH2, WBH3) | N/A |
| Bore Licence Certificate | 20BL173843 | 1 Oct 2014 - Perpetuity | Monitoring Bore (BB1, BB2, BB3) | N/A |

| Licence Held | Licence Number | Validity of Licence | Purpose of Licence | Extraction Limit |
|---|---|---|---|---|
| Bore Licence Certificate | 20BL173878 | 8 Dec 2014 - Perpetuity | Monitoring Bore (MB01) | N/A |
| Bore Licence Certificate | 20BL173891 | 19 Mar 2015 - Perpetuity | Monitoring Bore (MB02) | N/A |
| Water Access Licence / Associated Works | WAL19181 / 20AL210298 | Continuing | Unregulated River Water Licence | Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone.<br>10 shares |
| Water Access Licence / Associated Works | WAL41504 / 20AL217003 | Continuing | Aquifer - Industrial dewatering<br>16CT pump station<br>No 2 Shaft<br>No 2 Shaft Borehole | Sydney Basin – North Coast Groundwater Source. North Coast Fractured and Porous Rock Groundwater Sources 2016.<br>Extraction limit of 770ML in any 12-month period commencing 1 July |

## 7.2 Water Take

**TABLE 7-2 WATER TAKE 2018-19**

| Water Licence # | Water sharing plan, source and management zone (as applicable) | Entitlement | Passive take / inflows (ML) | Active pumping (ML) | TOTAL (ML) |
|---|---|---|---|---|---|
| WAL19181 / 20AL210298* | Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone. | 10 shares | 0 | 0 | 0 |
| WAL41504 / 20AL217003 | Sydney Basin – North Coast Groundwater Source. North Coast Fractured and Porous Rock Groundwater Sources 2016. | Extraction limit of 770ML in any 12-month period commencing 1 July | 582 | 0 | 582 |

** this WAL is not utilised at present by Austar*

## 7.3 Surface Water

### 7.3.1 Environmental Management

The Austar SWMP has been prepared in accordance with the requirements of development consent DA29/95, Project Approval PA08_0111 and EPL 416, and includes a surface water monitoring program. The SWMP was recently revised in June 2018 was approved by the DPIE on 1 August 2018.

Austar have two licenced discharge points (LDPs) – SW1 is an emergency wet weather discharge point and SW6 which is permitted to discharge 5,000 kilolitres per day (as an annual average) of permeate (treated water from the Reverse Osmosis Plant).

Austar have engaged an environmental monitoring specialist to undertake routine surface water sampling and analysis in accordance with the SWMP. Austar's surface water monitoring program includes:

- Five (5) EPL monitoring sites (three creek sites and two discharge points); and
- Four (4) creek monitoring sites (three (3) sites in Quorrobolong Creek and one (1) site in Cony Creek).

In addition, grab samples are taken opportunistically from other points around the mine when required (e.g. sediment dams and mine water storage dams). The surface water monitoring locations are presented in **Table 7-3** and shown on **Plan 2**.

**TABLE 7-3 SURFACE WATER MONITORING LOCATIONS AND EPL CRITERIA**

| Area | Monitoring Location | Parameters | EPL Limits /Criteria |
|---|---|---|---|
| CHPP – EPL Points | • **SW1** – Emergency Dam Spillway, **EPL Point 1** | pH<br>EC<br>Fe<br>TDS<br>TSS<br>Volume | 6.5-8.5<br>N/A<br>1 mg/L<br>6,000 mg/L<br>50 mg/L<br>2,000 KL/day |
| | • **SW2** – Bellbird Creek Pinch Bridge, **EPL Point 2**<br>• **SW4** – Bellbird Creek Eastern Boundary Downstream of CHPP, **EPL Point 4**<br>• **SW5** – Unnamed Creek Western Boundary Upstream of CHPP, **EPL Point 5** | EC<br>pH<br>Fe<br>TSS | N/A<br>N/A<br>N/A<br>N/A |

| Area | Monitoring Location | Parameters | EPL Limits /Criteria |
|---|---|---|---|
| | • **SW6** – 1ML tank discharge to Bellbird Creek, **EPL Point 6** | EC<br>pH<br>Fe<br>TSS<br>Volume | 600 µS/cm<br>6.5-8.5<br>1 mg/L<br>50 mg/L<br>5,000 KL/day as annual average |
| Creeks – Underground Mining Areas | • **SWQ1** – Quorrobolong Creek (Sandy Creek Road)<br>• **SWQ2** – Quorrobolong Creek (Austar Owned land)<br>• **SWQ3** – Quorrobolong Creek (Austar Owned Land)<br>• **SWC1** – Cony Creek (Quorrobolong Rd) | EC<br>pH<br>Fe<br>TSS | N/A<br>N/A<br>N/A<br>N/A |

### 7.3.2 Environmental Performance

A summary of surface water monitoring is presented in **Appendix A**. Only EPL licensed discharge points SW1 and SW6 have water quality limits. Other locations are monitored for baseline data, or to observe any changes in water quality in the Bellbird South and Stage 3 mining areas.

There was no discharge event from SW1 (emergency overflow dam) during the reporting period. A total of 658ML was discharged from SW6 over the reporting period, which is an average of 1.8ML/day.

At SW6, water quality results for all tested parameters (pH, EC, TSS and Fe) were within EPL limits, with the exception of one sample taken in January and further described in **Section 7.3.4**.

For the background CHPP creek monitoring points (SW2, SW4 & SW5):

- pH measured at individual sites remained relatively constant ranging between pH 6.13 (SW2) to pH 7.52 (SW5), which was similar to the 2017-18 range of pH 6.26 to pH 7.78;
- EC ranged between 154µS/cm (SW2) and 673µS/cm (SW5), which was similar to most results in the 2017-18 range of 154µS/cm (SW2) to 9870µS/cm (SW5), with the exception of some outlying results at SW5 in the previous reporting period;
- TSS ranged between <5mg/L (SW2, SW4) to 18mg/L (SW5) for the reporting period, which was lower than the 2017-18 range of <5mg/L (SW2, SW4) to 114mg/L (SW5) (probably due to low flows); and
- Fe (Iron) recorded a minimum of <0.05mg/L (SW2) and a maximum of 3.03mg/L (SW5) for the reporting period, the maximum recorded Fe was lower than the maximum of the range of the 2017-18 reporting period (8.82mg/L at SW5) and the 2016-17 reporting period (26.7mg/L at SW5).

Refer to **Appendix A** for surface water quality graphs.

The variability in the results from SW5, upstream of the mine, is thought to be due to the ephemeral nature of the stream in this location with results historically being variable. During the reporting period, seven months were too dry to sample at SW5. All sites were dry in March 2019.

Natural fluctuations in water quality in Quorrobolong and Cony Creeks were observed, with sample points displaying expected results when compared to previous years due to drought conditions, low flows and still water in creek sampling locations. No environmental impacts upon surface waters from mining can be interpreted.

For the Quorrobolong and Cony Creek monitoring points (SWQ1, SWQ2, and SWQ3 & SWC1):

- There was only one result recorded in Quorrobolong Creek during the reporting period (at SWQ1 in November 2018). The creek was dry in all monitoring locations during the rest of the year. Coney Creek could be sampled each month, as the sampling point is a large pool of water. Results vary throughout the reporting period, which is to be expected given the lack of rainfall to flush the pool.

- pH ranged between pH 3.78 and pH 7.99, which is lower than the 2017-18 range of pH 6.99 to 8.2.

- EC results ranged between 1,120µS/cm and 3,710µS/cm, a greater range than the 2017-18 range of 1560 – 2640 µS/cm and the 2016-17 range of 599µS/cm to 3,170µS/cm. This can be expected in the dry conditions recorded throughout the reporting period.

- TSS ranged from 11mg/L to 33mg/L, which is a reduced range when compared to previous years (<5 - 77mg/L in 2017-18) and (<3mg/L to 388mg/L) in 2016-17.

- Fe (Iron) results range from 0.6mg/L to a maximum of 13.9mg/L. Iron levels are higher when compared to last year (0.6 to 6.19mg/L), but lower than the range recorded in the 2016-17 range of 0.452mg/L to 63mg/L.

### 7.3.3 CHPP Investigation Drainage Line

There were no surface water environmental incidents during the current reporting period, however one reportable incident from the 2016-17 period has ongoing actions. Orange staining/residue was observed in a clean water drainage line at the CHPP during the 2016-17 reporting period and reported as an incident to the EPA.

The drainage line is ephemeral and mainly dry. Austar commenced a monitoring program to investigate the source of the orange staining / residue, and advised the regulators. Monitoring and investigation are continuing during the 2018-19 reporting period in line with conditions U3 and E2 of

the EPL 416. These conditions were added on 15 December 2017 specifically to address the orange staining issue in the drainage line at the CHPP.

Condition U3.3 requires the submission of an updated monthly report containing the monitoring results required by Condition U3.2. Condition U3.2 monthly monitoring requirements are: sampling of surface water in the Investigation Drainage Line; sampling of groundwater from the groundwater bore adjacent to the Investigation Drainage Line; and photos taken at specific locations along the Investigation Drainage Line. Reports have been submitted each month to the EPA, DPIE Compliance Branch and DPIE-RR for the reporting period.

Condition E2 requires that the orange staining / residue within the clean water drain must be fully contained with the premises at all times. Any discharges to waters of this residue must comply with Condition L1.1 of the EPL which states that the licensee must comply with Section 120 of the *Protection of the Environment Operations Act 1997*. A bunded containment area at the downstream extent of the Investigation Drainage Line has been installed to address this condition. Water captured is pumped from this containment area into the CHPP dirty water system.

### 7.3.4 Water Discharge Exceedance at SW6

During the reporting period, there was an exceedance of water quality limits recorded at Licenced Discharge Point 6 (SW6). SW6 is the licenced discharge point where Reverse Osmosis treated water (permeate) is discharged to Bellbird Creek.

Water samples were collected from SW6 on the 4$^{th}$ January. Laboratory results were returned to site on the 11$^{th}$ January. The EC result was 667 µs/cm against a limit of 600 µs/cm. All other analytes (pH, TSS and Iron) were within limits.

The RO plant was being serviced at the time the water sample was taken. While there is usually a chain of three RO plants in operation, only one was operating on the 4$^{th}$ January, and no water was intended to be transferred to the 1ML tank (and then to the discharge point).

The cause of the non-compliance was likely a result of one (or more) valves at the RO Plant having not seated correctly after maintenance activities occurred, allowing a small amount of out of specification water to travel to the 1ML tank. This out of specification water would have been diluted by the clean water stored in the 1ML tank prior to any discharge to Bellbird Creek. The treated permeate discharged to the 1ML tank was within the baseline conductivity range of the creek.

On the 11 January 2019 when Austar became aware of the exceedance all maintenance activities were completed on RO Plant 1 and conductivity readings were again within the EPL limit of 600µs/cm. Real-time data was reviewed and real-time conductivity monitoring at the discharge to permeate tank showed readings within limits.

## 7.4 Ground Water

### 7.4.1 Environmental Management

The Austar SWMP has been prepared in accordance with the requirements of development consent DA29/95 and Project Approval PA08_0111, and includes a groundwater water monitoring program. The revised SWMP was approved by the DPIE on 1 August 2018.

An environmental monitoring specialist is engaged by Austar to undertake quarterly groundwater monitoring and analysis in accordance with the SWMP, utilising nine piezometers (MB01, MB02, MB03A, MB04, AQD1073a, NER1010, WBH1, WBH2 and WBH3) to assess impacts on groundwater levels in the Bellbird South, Stage 2 and Stage 3 mining areas. The locations of these monitoring sites are presented in **Plan 2**.

Austar's groundwater monitoring program also includes monthly, quarterly or annual monitoring of underground flows, water quality and pressure for operational purposes. Groundwater level data from EX01H is downloaded quarterly.

Groundwater resources in the vicinity of Austar are detailed in the SWMP.

### 7.4.2 Environmental Performance

**Appendix B** illustrates the groundwater monitoring results at Austar during the reporting period. The graphs illustrate groundwater depth, rainfall, pH and conductivity. Trends from the monitoring program are summarised below:

- A slow but constant decline in groundwater levels was recorded in all Bellbird South, Stage 2 and Stage 3 groundwater monitoring bores throughout the reporting period, consistent with dry conditions.

- The NER1010 monitoring bore, within a non-alluvial hard rock aquifer, has shown erratic results for level and water quality during the reporting period. During the next reporting period, this hole will be investigated with a downhole camera and airlifted, to assess the condition of the bore.

- Groundwater quality (pH and EC) remained relatively stable during the reporting period and when compared to the previous reporting period. No obvious mining impacts have been identified in relation to pH and EC results.

During the previous reporting period, a Historical Groundwater review and Assessment was completed, in consultation with DPIE and Department of Industry – Water (DoI-Water). In January

2019, Austar Coal Mine, the DPIE and DoI-Water agreed on a modified monitoring program for one year (2019) to better understand the groundwater chemistry in the Quorrobolong Valley.

The proposed changes to the monitoring program include:

- Taking samples before and after purging (to support the conclusion that stratification may have been skewing monitoring results and allow for better comparison between Austar and DoI monitoring bores).
- Commence laboratory testing of basic parameters EC, pH, TDS, along with major ions.

The 12 months of monitoring will inform the need for any changes to the existing approved TARP and this will be documented in a final report, due in January 2020.

# 8 REHABILITATION

Rehabilitation and land management activities were undertaken in accordance with the approved MOP. Consistent with the MOP, there were no areas of rehabilitation relinquished or signed off by DPIE-RR during the reporting period.

During the next reporting period, rehabilitation, maintenance and monitoring of reject emplacement areas will continue as required. Austar will also continue working with Council to seek heritage approval for demolition of selected heritage structures.

The MOP defines rehabilitation phases for each domain, and the completion criteria for each phase. For each domain, specific performance indicators have been established to allow the progress of rehabilitation to be measured.

## 8.1 Buildings

No buildings were demolished during the reporting period. Several buildings are proposed to be demolished as part of site rehabilitation works including the remaining buildings at the Bellbird Colliery, Kalingo Colliery and several buildings and the pony stables at Pelton Colliery.

A Historical Heritage Assessment and Structural Engineer's inspection report were completed in November 2008 and August 2008 respectively. The Heritage Assessment identified items which did not require further heritage management, and items of potential heritage value. Items which were identified as having no heritage significance in the Heritage Assessment will be progressively demolished.

The requirements for Heritage Management will need to be balanced against structural and safety issues identified in the Structural Engineer's report and by DRG. Consultation will continue with Council in the 2019-20 reporting period.

## 8.2 Rehabilitation of Disturbed Land

The Tailings Storage Facility and Reject Emplacement Area domain has been identified for rehabilitation activities during the MOP term and are discussed in the sections below. Subsidence remediation may also be required in the Underground Mining Area (Extraction Plan) domain if impacts are observed. All other areas of the mine remain in the Active domain.

### 8.2.1 Reject Emplacement Areas

There are currently three areas within the Tailings Storage Facility and Reject Emplacement Area domain under active rehabilitation, maintenance and monitoring:

- Aberdare Reject Emplacement Area – active emplacement area in various phases of rehabilitation (refer **Plan 3B** Aberdare Extended Emplacement Area Mining and Rehabilitation 30 June 2019). Post rehabilitation land use is Grassland;
- Area 12 – Former reject emplacement area that has been substantially revegetated. A stockpile of capping material remains, which is planned to be used for capping in other reject emplacement areas. Post rehabilitation land use is Grassland;
- Area 13 – Former reject emplacement area that is within the Ecosystem and Landuse Sustainability Phase. A sinkhole exists in this area that is being investigated for remediation. Post rehabilitation land use is Grassland.

During the reporting period, capping activities were undertaken at the Aberdare Reject Emplacement Area, as shown in **Plan 3B**. a total of 0.93ha was capped and compacted to 1 metre depth using suitable material from the overburden stockpile adjacent to West Pit. It is planned to cap a further 0.6ha in next reporting period.

Potential capping material was identified and permeability testing was undertaken to ensure the material would be effective at reducing seepage and maintaining compaction over the reject emplacement area. Capping material was spread in 30cm lifts, and compacted with a roller prior to the next layer of capping being applied. Compaction testing was then undertaken one each layer to make sure the material formed an adequate barrier. Refer to Section 8.3 for further information.

Dirty water areas continue to drain to underground workings. Detailed design of the clean water diversion drain will be progressed over future reporting periods.

#### 8.2.2 Underground Mining Area (Extraction Plan)

No mining impacts have been observed that require remediation works in the Bellbird South LWB1-LWB7 Extraction Plan area.

#### 8.2.3 Exploration

There was no surface exploration works undertaken during this reporting period. All previous exploration boreholes have been rehabilitated (however the associated rehabilitation completion forms are yet to be lodged). Future exploration works are detailed in Section 4.1.

### 8.1 Rehabilitation Maintenance

During the reporting period, a rehabilitated area on the southern end of the Aberdare Emplacement Area was monitored and found to be lacking vegetation establishment in isolated areas. The capping material in the bare patches was removed and a growth medium applied. During the next reporting

period the soil will be sampled and relevant ameliorants added, before reseeding (dependent of the weather).

## 8.2 Rehabilitation Monitoring

In accordance with the MOP, reject emplacement areas where rehabilitation has been undertaken to grassland, are to be monitored on an annual basis until they are self-sustaining and no longer require management.

During the reporting period, the rehabilitation monitoring program methodology was varied to better assess the rehabilitation against performance criteria outlined in the MOP and to identify potential targeted management strategies as required. Monitoring at the Aberdare emplacement area was supplemented with further monitoring locations at Area 12 and Area 13.

Key to progression of all monitoring locations is a reduction in weed cover and a reduction in human interference (such as rubbish, bike tracks and burnt out cars).

Results of the monitoring were compared to Performance Criteria for the Ecosystem and Landuse Establishment and Sustainability phases (**Table 8-1 - Table 8-3)**.

**TABLE 8-1 AREA 12 COMPARISON TO MOP PERFORMANCE CRITERIA**

| Comparison to Relevant Performance Criteria[1] | | | |
|---|---|---|---|
| **Performance Criteria** | **Assessment of Progress** | **Completion Criteria** | **Assessment of progress** |
| **Phase – Ecosystem and Land Use Establishment (Secondary Domain – Rehabilitation Area (Grassland))** | | | |
| Suitable target species are used to establish a grassland ecosystem | Initial seed mix utilised unknown<br>**Unknown** | Areas are seeded with target species (**Appendix 2**) immediately following growth medium establishment | Timing of seeding and species utilise are unknown<br>**Unknown** |
| Success of initial strike after seeding | Initial success rates appear low – as evidenced by low levels of initially planted seed mix<br>**Progressing** | For Grassland areas, groundcover targets are (within 12 months of sowing during ecosystem establishment phase):<br>-0-20% canopy | 0%<br>**Meeting performance criteria** |
| | | -60-100% groundcover | 80%<br>**Meeting performance criteria** |

| Comparison to Relevant Performance Criteria[1] | | | |
|---|---|---|---|
| **Performance Criteria** | **Assessment of Progress** | **Completion Criteria** | **Assessment of progress** |
| Weed growth does not dominate during vegetation establishment phase | Weeds dominate groundcover<br>**Non-Meeting performance criteria** | | |
| **Phase – Ecosystem and Land Use Sustainability (Secondary Domain – Rehabilitation Area (Grassland))** | | | |
| Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use. | Rhodes grass (*Chloris gayana*) likely to colonise further if not controlled<br>**Progressing** | For Grassland areas, groundcover targets:<br>- 0-20% canopy | 0%<br>**Meeting performance criteria** |
| | | - 70-100% groundcover | 80%<br>**Meeting performance criteria** |
| Weeds identified on site are actively controlled and/or removed using appropriate weed control techniques to meet the final land use criteria. | - | Weeds are absent from canopy and understorey | Lantana present in low abundance<br>**Progressing** |
| **General** | | | |
| Minor rilling only (less than 30 cm by 30 cm) within areas that landform works have been undertaken. | | | No rilling observed<br>**Meeting performance criteria** |
| Weeds comprise no more than 20% of ground cover vegetation. | | | Rhodes grass comprises more than 20% of cover<br>**Progressing** |

[1] Excluding non-relevant criteria that are assessed as a separate program of work (such as those in relation to whether site has a bushfire management plan and is being managed for pest species)

**TABLE 8-2 AREA 13 REHABILITATION MONITORING COMPARISON TO MOP PERFORMANCE CRITERIA**

| Comparison to Relevant Performance Criteria[1] | | | |
|---|---|---|---|
| **Performance Criteria** | **Compliance** | **Completion Criteria** | **Compliance** |
| **Phase – Ecosystem and Land Use Establishment (Secondary Domain – Rehabilitation Area (Grassland))** | | | |
| Suitable target species are used to establish a grassland ecosystem | Initial seed mix utilised unknown<br>**Unknown** | Areas are seeded with target species (**Appendix 2**) immediately following growth medium establishment | Timing of seeding and species utilise are unknown<br>**Unknown** |
| Success of initial strike after seeding | Initial success rates appear low – as evidence by low levels of initially planted seed mix (as per Appendix 2 of MOP)<br>**Progressing** | For Grassland areas, groundcover targets are (within 12 months of sowing during ecosystem establishment phase):<br>-0-20% canopy | 0%<br>**Meeting performance criteria** |
| | | -60-100% groundcover | 75%<br>**Meeting performance criteria** |
| Weed growth does not dominate during vegetation establishment phase | Weeds dominate groundcover (pigeon grass))<br>**Progressing** | | |
| **Phase – Ecosystem and Land Use Sustainability (Secondary Domain – Rehabilitation Area (Grassland))** | | | |
| Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use. | Pigeon grass likely to colonise further if not controlled<br>**Progressing** | For Grassland areas, groundcover targets:<br>- 0-20% canopy | 0%<br>**Meeting performance criteria** |
| | | - 70-100% Groundcover | 75%<br>**Meeting performance criteria** |
| Weeds identified on site are actively controlled and/or removed using appropriate weed control techniques to meet the final land use criteria. | - | Weeds are absent from canopy and understorey | Lantana and blackberry present in low abundance<br>**Progressing** |
| **General** | | | |

| Comparison to Relevant Performance Criteria[1] | | | |
|---|---|---|---|
| **Performance Criteria** | **Compliance** | **Completion Criteria** | **Compliance** |
| Minor rilling only (less than 30 cm by 30 cm) within areas that landform works have been undertaken. | | | No rilling observed<br>**Meeting performance criteria** |
| Weeds comprise no more than 20% of ground cover vegetation. | | | Pigeon grass comprises more than 20% of cover<br>**Progressing** |

[1] Excluding non-relevant criteria that are assessed as a separate program of work (such as those in relation to whether site has a bushfire management plan and is being managed for pest species)

**TABLE 8-3 ABERDARE EMPLACEMENT AREA REHABILITATION MONITORING COMPARISON TO MOP PERFORMANCE CRITERIA**

| Comparison to Relevant Performance Criteria[1] | | | |
|---|---|---|---|
| **Performance Criteria** | **Compliance** | **Completion Criteria** | **Compliance** |
| **Phase – Ecosystem and Land Use Establishment (Secondary Domain – Rehabilitation Area (Grassland))** | | | |
| Suitable target species are used to establish a grassland ecosystem | Site dominated by suitable species<br>**Meeting performance criteria** | Areas are seeded with target species (**Appendix 2**) immediately following growth medium establishment | Site dominated by suitable species<br>**Meeting performance criteria** |
| Success of initial strike after seeding | Initial seed strike success was low, approximately 30% of vegetation present comprises non-target species<br>**Progressing** | For Grassland areas, groundcover targets are (within 12 months of sowing during ecosystem establishment phase):<br>-0-20% canopy | 0%<br>**Meeting performance criteria** |
| | | -60-100% groundcover | 85%<br>**Meeting performance criteria** |

| Comparison to Relevant Performance Criteria[1] | | | |
|---|---|---|---|
| **Performance Criteria** | **Compliance** | **Completion Criteria** | **Compliance** |
| Weed growth does not dominate during vegetation establishment phase | Non-target weeds comprise approximately 30% of groundcover, however do not dominate the groundcover<br>**Meeting performance criteria** | | |
| **Phase – Ecosystem and Land Use Sustainability (Secondary Domain – Rehabilitation Area (Grassland))** | | | |
| Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use. | Pigeon grass and whisky grass and purpletop likely to colonise further if not controlled<br>**Progressing** | For Grassland areas, groundcover targets:<br>- 0-20% canopy | 0%<br>**Meeting performance criteria** |
| | | - 70-100% Groundcover | 85%<br>**Meeting performance criteria** |
| Weeds identified on site are actively controlled and/or removed using appropriate weed control techniques to meet the final land use criteria. | - | Weeds are absent from canopy and understorey | Purpletop is a dominant species in the understorey<br>**Progressing** |
| **General** | | | |
| Minor rilling only (less than 30 cm by 30 cm) within areas that landform works have been undertaken. | | | No rilling observed<br>**Meeting performance criteria** |
| Weeds comprise no more than 20% of ground cover vegetation. | | | Pigeon grass and purpletop comprise more than 20% of cover<br>**Progressing** |

[1] Excluding non-relevant criteria that are assessed as a separate program of work (such as those in relation to whether site has a bushfire management plan and is being managed for pest species)

## 8.3 Rehabilitation Trials and Research

A geotechnical investigation was commissioned during the 2017-18 reporting period. The aim of the investigation was to assess the subsurface soil and groundwater conditions at Aberdare Reject Emplacement Area to provide:

- Assessment of the existing drainage regime at Aberdare Reject Emplacement Area including review of mine Record Tracing provided by Yancoal;
- Discussions of options available to maintain existing drainage regime (into underground workings) as more material is placed and the site levels increased prior to capping;
- Assessment of the risk of generation of acid leachate;
- Comments on treatment and mitigation of leachate generation;
- Assessment of the propensity for spontaneous combustion and bushfire ignited combustion;
- Methods to reduce combustion risk; and
- Capping requirements to reduce combustion risk.

The investigation included a desktop review, site inspection by a geotechnical engineer, the excavation of test pits, and laboratory testing of selected samples.

While this report has not been finalised, further works including compaction testing of emplaced capping material and permeability testing of proposed cap and topsoil materials to assess suitability were undertaken to support the initial geotechnical investigations. These reports will be finalised in the next reporting period.

## 8.4 Rehabilitation Summary

During the reporting period rehabilitation was managed generally in accordance with the MOP. The mining and rehabilitation status is presented in Table 8-4. Rehabilitation activities at Aberdare Emplacement Area are shown on **Plan 3B**. Rehabilitation in Areas 12 and 13 are shown on **Plan 3C**.

**TABLE 8-4 REHABILITATION SUMMARY**

| Mine Area Type | Previous Reporting Period (Ha) | This Reporting Period (Ha) | Next Reporting Period (Ha) |
|---|---|---|---|
| | **(2017-18)** | **(2018-19)** | **(2019-20)** |
| Total Mine Footprint | 182.01 | 182.01 | 182.01 |
| Total Active Disturbance | 137.94 | 137.01 | 136.4 |
| Land being Prepared for Rehabilitation | 0 | 0.93 | 0 |
| Land under active Rehabilitation | 44.07 | 44.07 | 45.61 |

*Notes from NSW Govt Annual Review Guideline (October 2015):*
***Total mine footprint*** *includes all areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to mining and associated activities. As such it is the sum of total active disturbance,*

*decommissioning, landform establishment, growth medium development, ecosystem establishment, ecosystem development and relinquished lands (as defined in DPIE-DRG MOP/RMP Guidelines). Please note that subsidence remediation areas are excluded.*

***Total active disturbance** includes all areas ultimately requiring rehabilitation such as: on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), and tailings dams (active/unshaped/uncapped).*

***Land being prepared for rehabilitation** – includes the sum of mine disturbed land that is under the following rehabilitation phases – decommissioning, landform establishment and growth medium development (as defined in DPIE-DRG MOP/RMP Guidelines).*

***Land under active rehabilitation** - includes areas under rehabilitation and being managed to achieve relinquishment – includes the following rehabilitation phases as described in the DPIE-DRG MOP/RMP Guidelines – "ecosystem and land use establishment" (area seeded OR surface developed in accordance with final land use) and "ecosystem and land use sustainability" (revegetation assessed as showing signs of trending towards relinquishment OR infrastructure development).*

***Completed rehabilitation** – requires formal sign-off by DPIE-DRG that the area has successfully met the rehabilitation land use objectives and completion criteria.*

## 8.5 Rehabilitation Actions for the Next Reporting Period

The following actions are proposed for the 2019-20 reporting period:

- Topsoil the capped areas of Aberdare Emplacement Area, undertake soil testing and seek expert advice for application of fertiliser and ameliorants to establish groundcover,
- Continue to cap areas of reject at Aberdare Reject Emplacement Area where the reject has reached design levels,
- Undertake soil testing and seek expert advice for application of ameliorants and further seeding of vegetated areas, if required, to increase groundcover at Aberdare Reject Emplacement Area for land in the Growth Medium Development and Ecosystem and Landuse Establishment phases;
- Progress approximately 1.5ha from the Landform Establishment and Growth medium development phases through to the Ecosystem and Landuse sustainability phase.
- Prepare a Report documenting the findings of the coarse rejects drainage and capping investigations.

# 9 COMMUNITY RELATIONS

Austar is committed to minimising the impacts of its operations and is an active participant and contributor to community projects that benefit local people.

## 9.1 Community Support Program

The aim of Austar's Community Support Program is to invest in community projects and local initiatives with the potential to make a positive difference. Yancoal invests in community groups working in the areas of health, social and community, environment, education and training. The Community Support Program is advertised in the local newspaper and on the Austar website.

During the reporting period, the program was open for applications from 3 December 2018 to 31 January 2019. Recipients of the 2019 Program funds included:

- Cessnock Chamber of Commerce – Mining Lane Project
- Cessnock Chamber of Commerce – STOMP Festival
- Cessnock City Council – Our Bushland Bioblitz 2019
- Kiray Putjung Aboriginal Corporation – Kiray Putjung Art Trail and Workshops
- Kitchener Public School – Head and Heart Mindfulness Program
- Millfield Public School – Community Garden
- Richmond Vale Railway Museum – Canteen Upgrade

The 2020 community support program will be open for applications in Q4 2019 and assessed early in the new year.

## 9.2 Community Sponsorship

In addition to the Community Support Program, Austar sponsors local community initiatives. In the 2018-19 reporting year sponsorship included:

- Cessnock Adopt-a-Road project
- Kurri Kurri Rugby League sponsorship
- Cessnock Rugby League sponsorship
- Westpac Kurri Coalface Pedal
- Ellalong Hotel Woodchop
- 2019 Cessnock Mayoral Scholarship
- Paxton Men's Bowling Club
- Cessnock High School

## 9.3 Community Liaison

The mine continues to maintain close relationships with all neighbouring properties, as well as nearby communities as part of normal business.

### 9.3.1 Community Consultative Committee (CCC)

The Austar Community Consultative Committee (CCC) continued to operate during the 2018-19 reporting period. The CCC is conducted generally in accordance with the DPIE's Community Consultative Committee Guideline (January 2019). Meetings are held on a quarterly basis and the membership is shown in **Table 9-1**. During the reporting period Austar held four CCC meetings, which occurred on the following dates:

- 29 August 2018;
- 28 November 2018;
- 20 February 2019
- 29 May 2019.

**TABLE 9-1 AUSTAR COMMUNITY CONSULTATIVE COMMITTEE (CCC) DURING THE REPORTING PERIOD**

| Organisation/Representative | Name |
|---|---|
| Independent Chairperson | Ms Margaret MacDonald-Hill |
| Cessnock Council Representative | Clr Mark Lyons |
| Community Representatives | Mr Alan Smith<br>Ms Ashlee Baker<br>Mr John Rayner<br>Mr Peter Sturrock<br>Chief Inspector Michael Gorman* |
| Company Representatives | Mr Brian Wesley<br>Ms Carly McCormack<br>Mr Josh Chadwick / Ms Julie McNaughton* |

*Note: Julie McNaughton commenced as Austar's Environment & Community Coordinator in May 2019 replacing Josh Chadwick as a Company Representative, Chief Inspector Michael Gorman joined the CCC in May 2019.

Austar coordinates these meetings, and provides information on mining progress, community programs and environmental performance. The annual review of the CCC and meeting minutes are located on the Austar coal website: http://www.austarcoalmine.com.au. The major discussion points from the Austar meetings in 2018-19 were:

- Current mining operations – underground, CHPP, Exploration, Bellbird South Area progress, Stage 3 progress, staff reductions, Resource Regulator notices;

- Environmental monitoring and results;
- Environmental incidents;
- Community complaints; and
- Community sponsorships.

### 9.3.2 Resident Consultation

During the 2018-19 reporting period, Austar consulted with individual residents who live in areas potentially affected by Austar's operations as required. This consultation was often conducted informally, in a manner that allowed the residents to openly discuss issues of importance to them. Monitoring results were often provided and progress of mining operations discussed as part of this resident consultation.

Stakeholders including landholders and infrastructure owners over the Bellbird South LWB1-B7 mining area, and relevant NSW Government Departments were provided with updates by letter to inform of the location and timing of extraction of the longwall panels, and predicted and measured environmental impacts. There were three updates provided during the reporting period.

Ongoing consultation on mining operations in the Bellbird South area and for exploration activities will continue in the next reporting period.

## 9.4 Community Complaints

Austar's Environmental Management Strategy (EMS) includes a procedure for receiving, investigating, responding and reporting complaints received from the community. Austar maintains a 24-hour-a-day, 7 days a week, free call number 1800 701 986 to receive environmental complaints and other enquiries.

Consistent with the previous reporting year, in 2018-19 reporting period a total of two (2) complaints were received, one regarding noise generated by a pump at Kalingo Dam, and one relating to an Austar contractor reported to be driving too fast on a rural road. Details of the complaints are provided in **Table 9-2**.

**TABLE 9-2 COMMUNITY COMPLAINTS SUMMARY**

| Time and Date | Category | Detail | Follow Up Actions |
|---|---|---|---|
| 31/07/2018 | Noise | Complainant reported that Austar's compressors at the 3 Shaft facility were generating an unusual noise | A resident of Glennie Street, Ellalong called on 31 July 2018 to report the 3 Shaft compressors had been making more noise than usual for the past 4 nights. E&C attended Glennie Street, 3 Shaft and Kalingo Dam areas, and observed unusual noise at 3 shaft area. Austar's engineering and maintenance team inspected Kalingo Dam/3 Shaft area later in the day and thought the elevated noise was caused by a relief |

| Time and Date | Category | Detail | Follow Up Actions |
|---|---|---|---|
| | | | bypass line valve on the nitrogen plant. The valve was closed until the nitrogen plant was checked by the service provider. Attended noise monitoring was undertaken that evening and mine noise was inaudible at Glennie Street. The service provider reopened the bypass valve as the increase in upstream pressure was causing the unit to cycle on and off and eventually shutdown. Two membranes were replaced that increased the efficiency of the plant and reduced flow. |
| 3/08/18, 3:40pm | Traffic | Complainant reported Austar contractor driving too fast on Coney Creek Lane, Quorrobolong. | Call received on the Community Complaints Line 3 August 2018 reporting a lady driving too quickly in a mine vehicle on Coney Creek Lane about 3:40pm. Complainant was concerned that school children walk home along the lane at that time. The vehicle was identified to be one of Austar's contractors who was collecting monitoring samples. The contractor was informed of the complaint and stated that they would drive more slowly in future. |

## 10 INDEPENDENT ENVIRONMENTAL AUDIT

An Independent Environmental Audit was conducted by SLR Consulting in the previous reporting period. The site visit was undertaken from 15 to 23 November 2017 and the report finalised in February 2018. The audit assessed the following key approvals:

- Stage 3 Project Approval (PA08_0111);
- Bellbird South Development Consent (DA 29/95);
- Environment Protection Licence 416;
- Environmental Assessment (EA) Modification 5 (MOD 5) Consolidated Statement of Commitments;
- Consolidated Mining Lease No 2 (Act 1992); and
- Water Access Licences.

There were ten recommendations made to address non-compliances against 19 conditions, eight of which were completed in the last reporting period. The ongoing actions from the last AR are listed in **Table 10-1**.

Of the six actions outstanding (through non-compliances and recommendations) at the commencement of this reporting period, four have been completed and two are ongoing. These actions will continue to be addressed during the next reporting period.

The next Independent Environmental Audit is scheduled to be undertaken in 2020. The Independent Audit report can be found on the Austar website.

**TABLE 10-1 INDEPENDENT ENVIRONMENTAL AUDIT FINDINGS 2017 – ONGOING ACTIONS**

| No | Independent Environmental Audit Recommendations | Austar Coal Mine Responses to DPIE on 27 February 2018 | Status |
|---|---|---|---|
| 11 | Demolition/Hazardous Substances - Complete the 'Progress Assessments for demolition of existing structures and foundations at Bellbird, Pelton & Cessnock No 1 shaft. This should include a review of historical heritage significance as well as hazardous substances. | Currently these structures are fenced off until the assessment work can be progressed. This is a rehabilitation commitment to be completed prior to lease relinquishment, complicated by the heritage status of these collieries. This assessment works is planned to be progressed during the next 2 years. | Ongoing |
| 24 | Reject Emplacement Area Capping - Recommend formal trials for capping the REA are undertaken. Justify capping depth and obtain approval from the DRG. | A study to confirm capping thickness was engaged in 2017 and is in progress. This is a commitment of the current MOP in relation to capping at the Aberdare Emplacement Area in consultation with the DRG. | Further studies were undertaken during the reporting period to further inform the capping study. It is planned these works will be completed in the next reporting period. |

## 11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

During the reporting period there were a number of events reported to the EPA and DPIE. These are described in **Table 11-1**.

**TABLE 11-1 POTENTIAL NON-COMPLIANCE REPORTS 2018-19**

| Incident No. | Date | Incident Details | Follow Up Actions |
|---|---|---|---|
| 1 | 11/06/19 | A reportable noise exceedance from the CHPP was identified at two (2) locations (C1 and C3) during routine noise monitoring on 11 June 2019. An assessment of low frequency noise, undertaken in accordance with the NPfI method, indicated that at two locations (NMC1 and NMC3) a 5dB penalty was required to the Austar only noise level. C1 was compliant without the application of the low frequency noise modifying factor. C3 exceeded prior to the application of the modifying factor. | **Immediate Actions:** EPA & DPIE were notified once it was confirmed that the noise limits were exceeded.<br><br>**Follow up Actions:** Follow up monitoring at the same location was carried out on 13/06/2019 without exceedance; Austar are continuing to work on the noise pollution reduction program (PRP) in consultation with the EPA; an incident report was submitted to EPA & DPIE on 19/6/2019. See Section 6.6.2 for further information. |
| 2 | 4/01/19 | Laboratory results for EPL water monitoring points for samples collected on 4 January 2019 were received on 11 January 2019 and recorded an exceedance of conductivity limits at LDP 6. The recorded conductivity result was 667 µs/cm against a limit of 600 µs/cm. All other analytes (pH, TSS and Iron) were within limits. | **Immediate Actions**: Upon receiving the laboratory results, retesting was undertaken (with results under the EPL limits).<br><br>Follow Up Actions: All applicable valves in the RO Plant were serviced and replaced as required. Routine scheduled maintenance of the RO plant will continue. See section 7.3.4 for further information. |

## 12 ACTIVITIES TO BE COMPLETED FOR THE NEXT REPORTING PERIOD

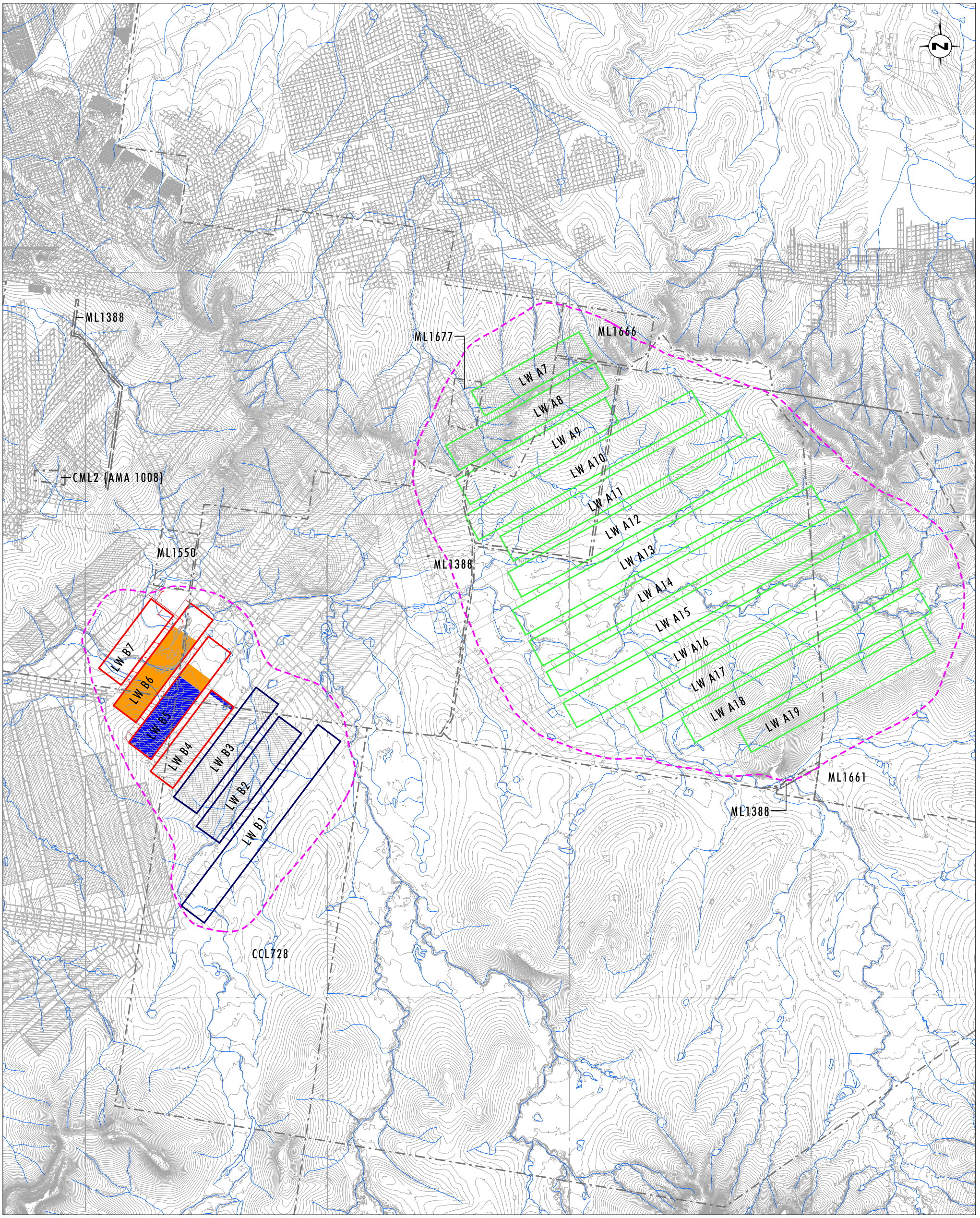
During the next reporting period, Austar will continue to address outstanding actions from the previous IEA (see Table 10-1) and the previous 17-18 Annual Review (Table 5-1).

Austar will also endeavour to carry out the following activities during the 2019-20 reporting period, as outlined in **Table 12-1**.

**TABLE 12-1 PROPOSED ACTIVITIES FOR 2019-20 REPORTING PERIOD**

| | Activities Proposed in the 2019-20 Reporting Period |
|---|---|
| 1 | Aberdare Emplacement Area capping, topsoiling and seeding |
| 2 | Independent Environmental Audit Planning and Preparation and continue to address the findings and actions of the Independent Environmental Audit. |
| 3 | Finalise geotechnical studies undertaken at Aberdare emplacement area and propose appropriate capping thickness to DPIE-RR |
| 4 | Continue studies required to determine a final landuse and relevant approvals and consents required for the surface flows within Area 13 and including potential reinstatement of surface flows within the area. |
| 5 | Progress heritage assessments to support demolition of existing structures and foundations at Bellbird, Pelton, and Cessnock No. 1 (Kalingo) Collieries. |
| 6 | Continued implementation of noise pollution reduction program at the Austar CHPP. |
| 7 | Phase 1 Contamination Assessment to be reviewed and actions considered. |
| 8 | Progressive implementation of the erosion and sediment control plan at the Aberdare Extended Emplacement area for capped areas with potential to drain to natural watercourses. Progress design and installation of the clean water diversion drain. |

# Plans




Data Source: Austar Coal Mine (2015), Bell and Driscoll (2008), OEH (2012)
Note: 2m Contour Interval

0 0.5 1.0 1.5km
1:30 000 (at A3)

## Legend

- Mining Lease Boundary
- Bellbird South B1-B3 Longwall Panels (DA29/95 MOD6)
- Bellbird South B4-B7 Longwall Panels (DA25/95 MOD 7)
- Layout for Stage 3 Longwall Panels (PA08_0111 MOD3)
- Previously Mined Land/First Workings
- 20mm Subsidence Contour Estimate
- Drainage Line
- Contour Line

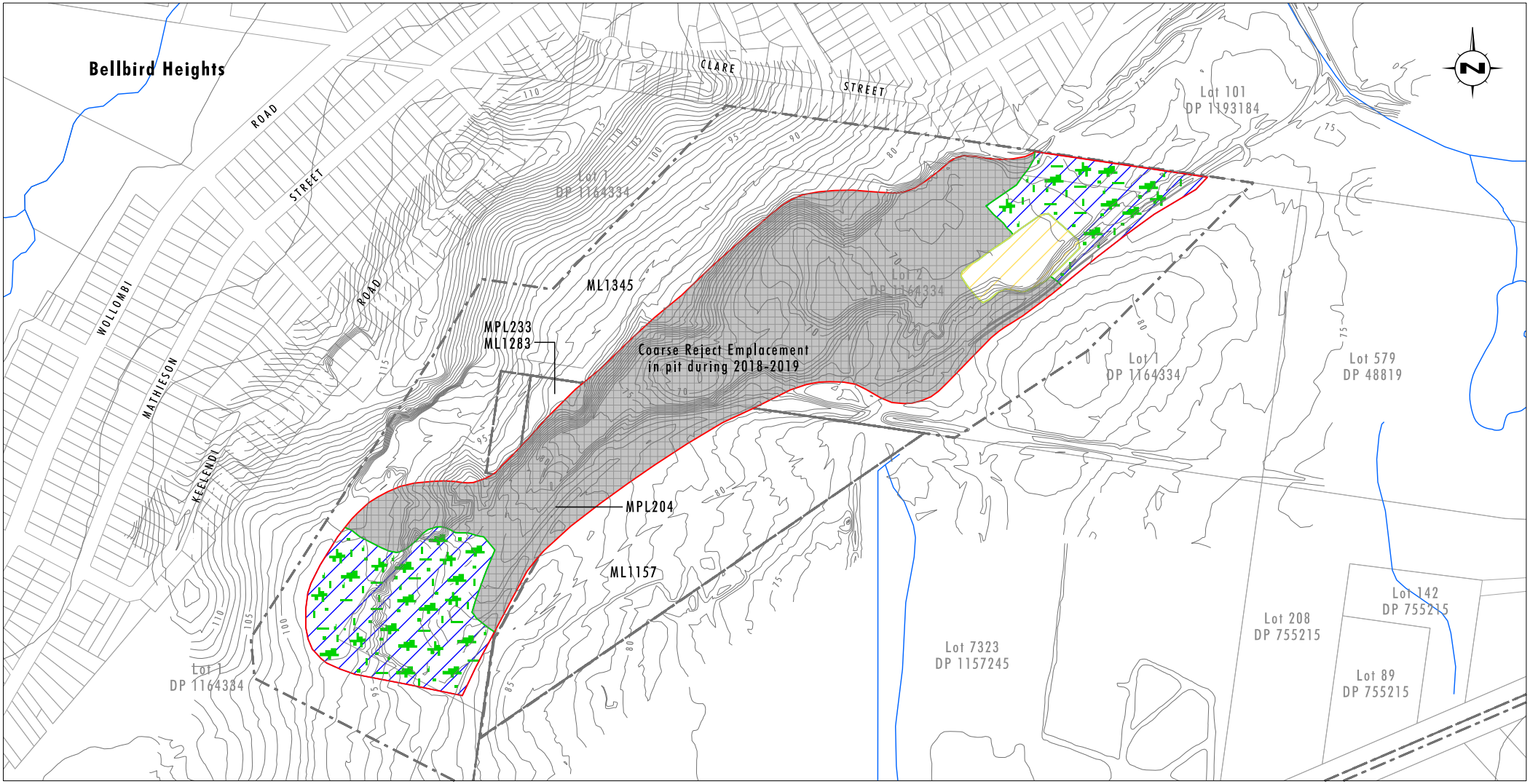
Mining Activities:
- July 2019 - June 2020
- July 2018 - June 2019

PLAN 3A

**Mining Activities**

Filw Name (A3):R14/3504_180.dgn
20190924 14.31

umwelt




Data Source: Austar Coal Mine (2015)
Note: 1m and 10m Contour Interval

0 100 200 400m
1:7500

## Legend

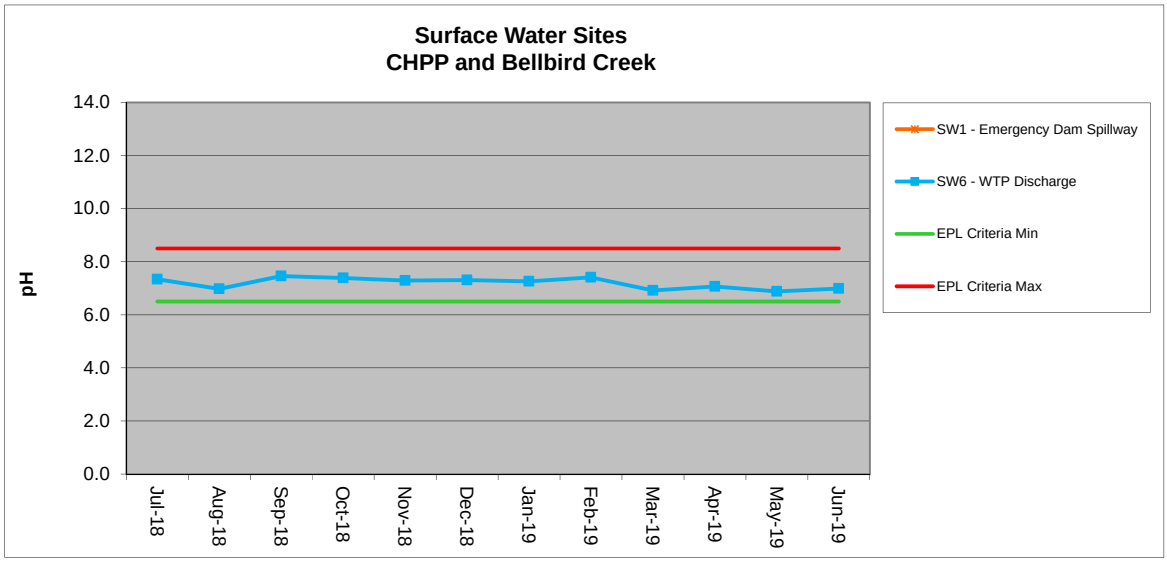
- Reject Emplacement Area
- Rehabilitation Area (Grassland)
- Ecosystem and Land Use Sustainability
- Landform Establishment 2018-2019
- Mining Lease Boundary
- Drainage Line
- Contour Line
- Cadastral Line

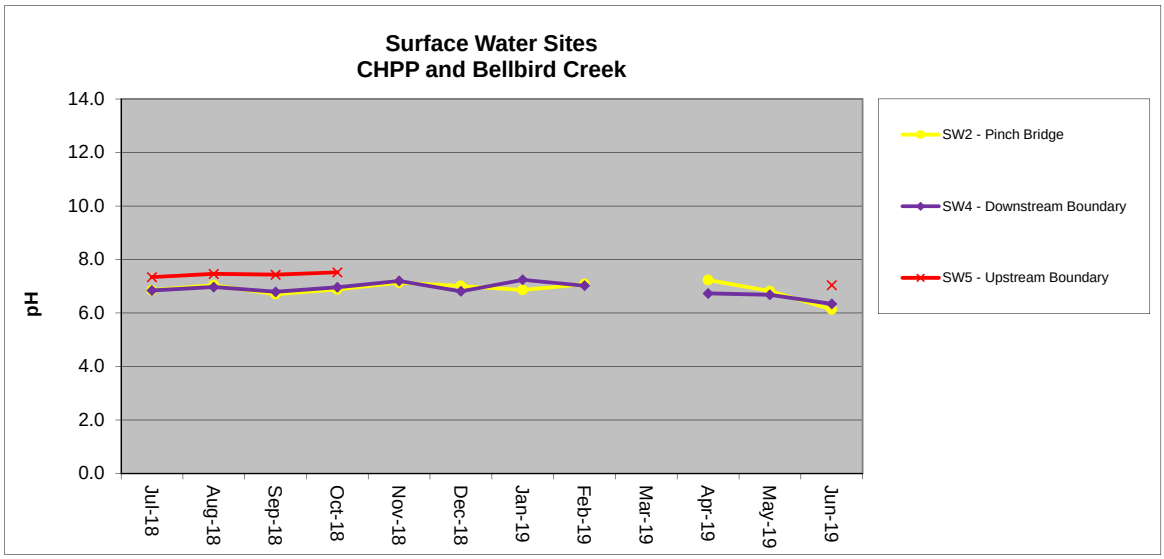
PLAN 3B

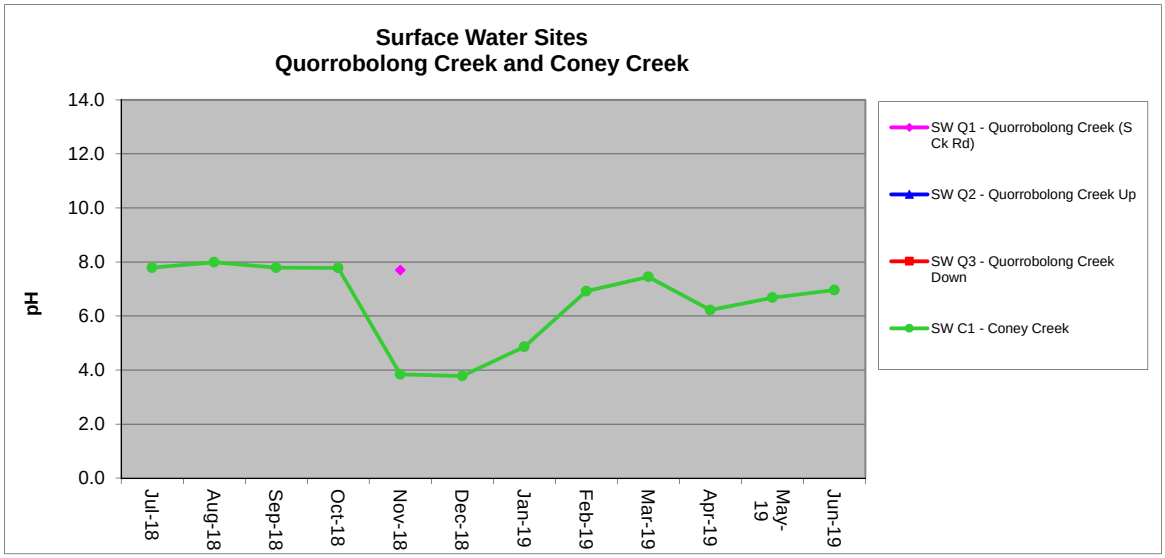
# Aberdare Extended Emplacement Area Mining and Rehabilitation

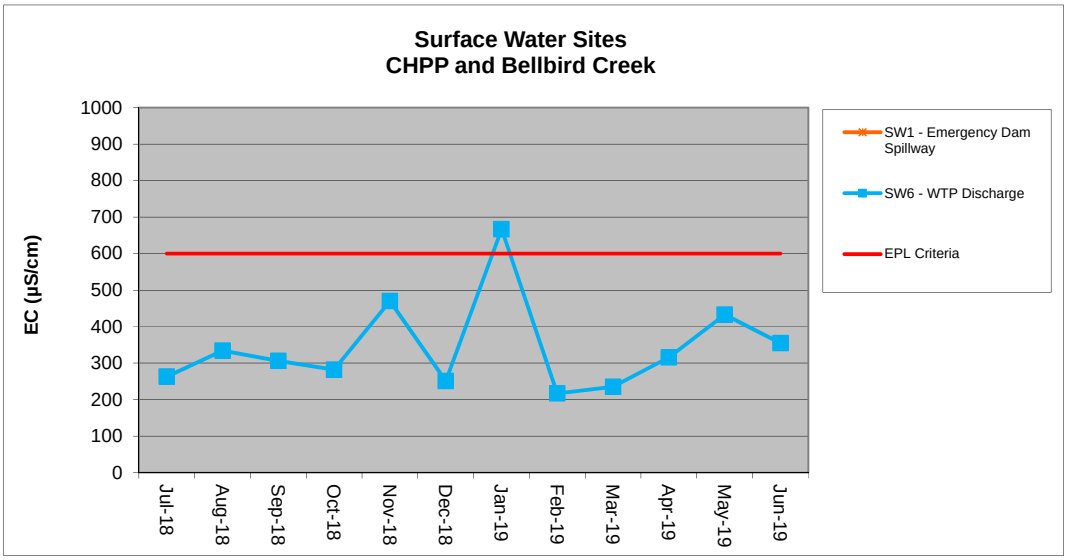
File Name (A4): R14/3504_181.dgn
20190924 16.11

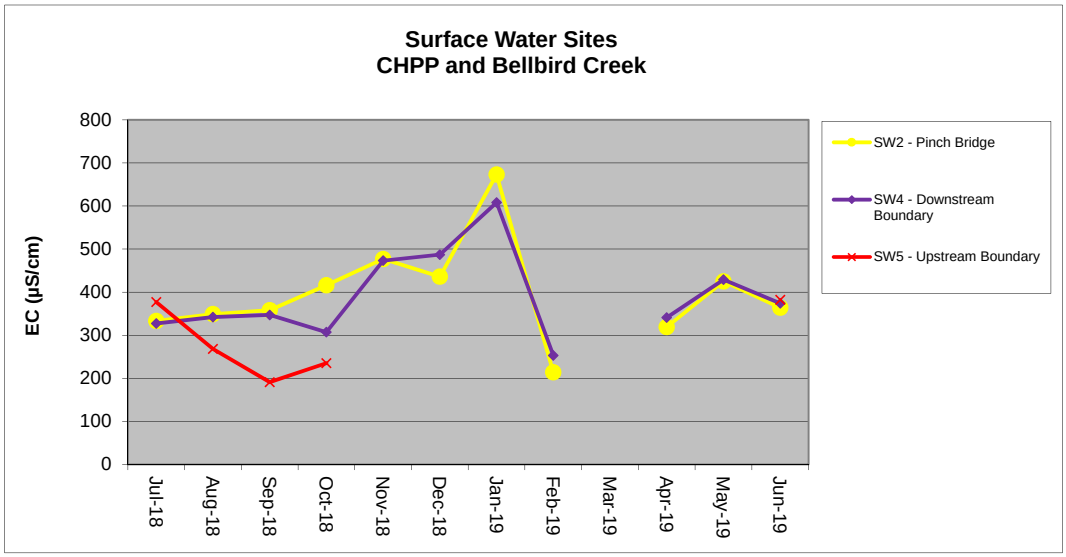
# Appendix A – Water Quality Data

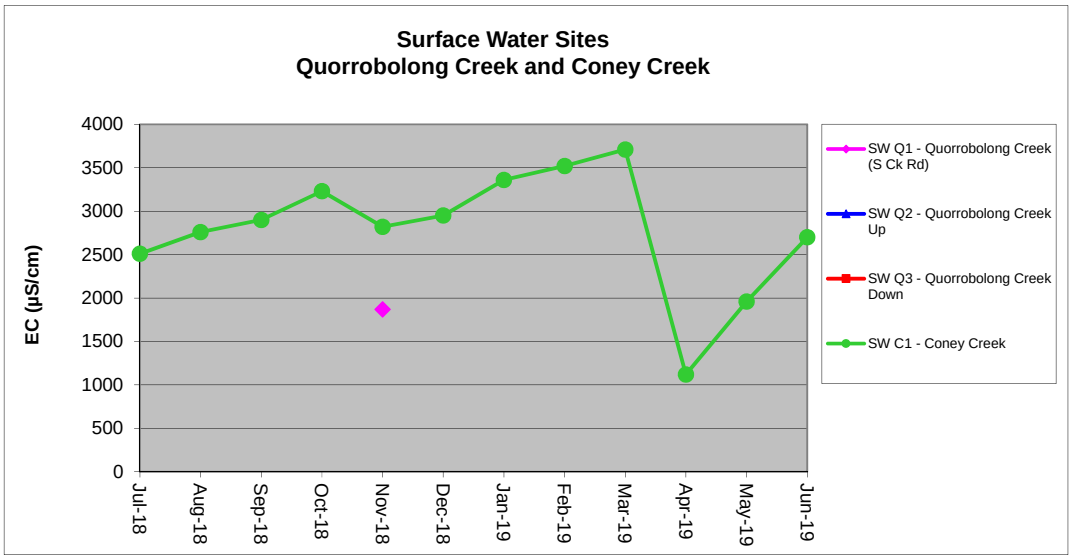

Surface Water Sites
CHPP and Bellbird Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria Min
EPL Criteria Max

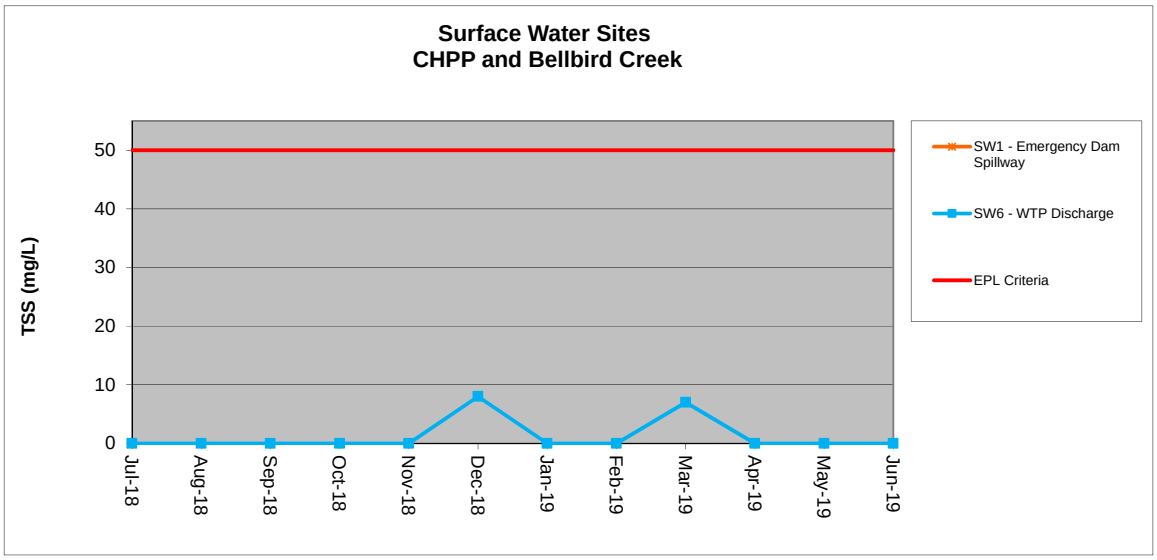

Surface Water Sites
CHPP and Bellbird Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

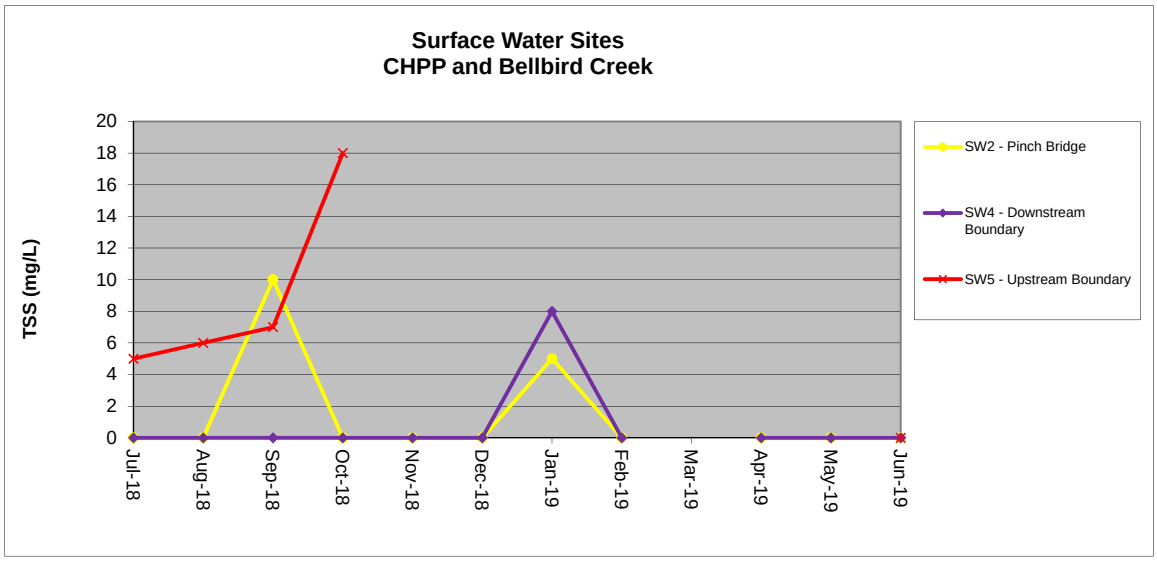

Surface Water Sites
Quorrobolong Creek and Coney Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW Q1 - Quorrobolong Creek (S Ck Rd)
SW Q2 - Quorrobolong Creek Up
SW Q3 - Quorrobolong Creek Down
SW C1 - Coney Creek

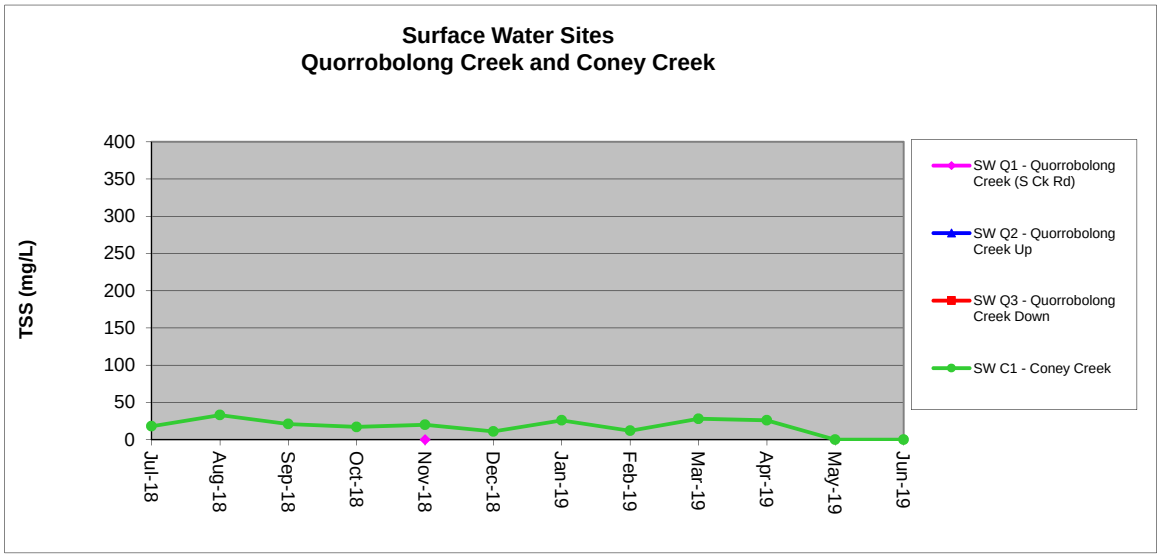

Surface Water Sites
CHPP and Bellbird Creek
EC (µS/cm)
1000
900
800
700
600
500
400
300
200
100
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria

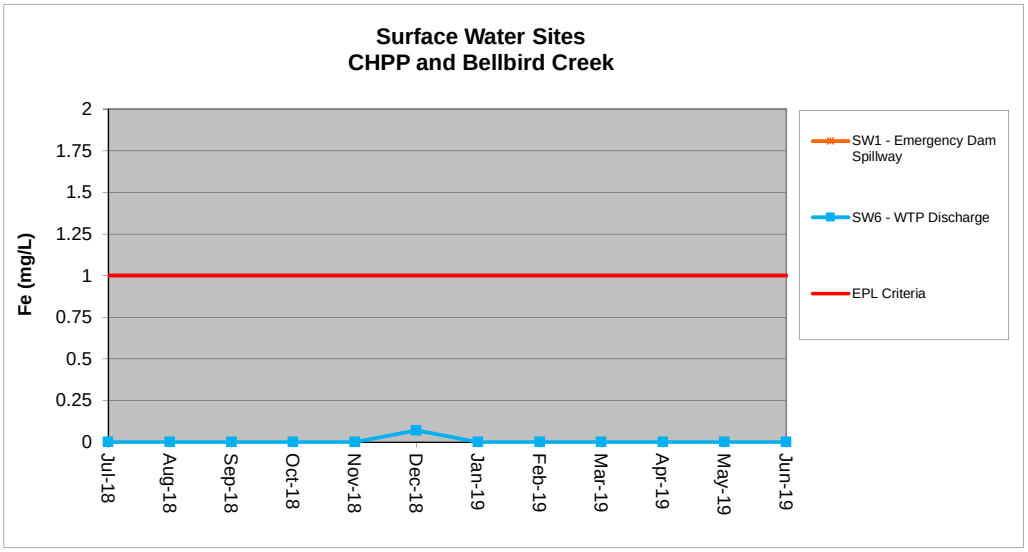

Surface Water Sites
CHPP and Bellbird Creek
EC (µS/cm)
800
700
600
500
400
300
200
100
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

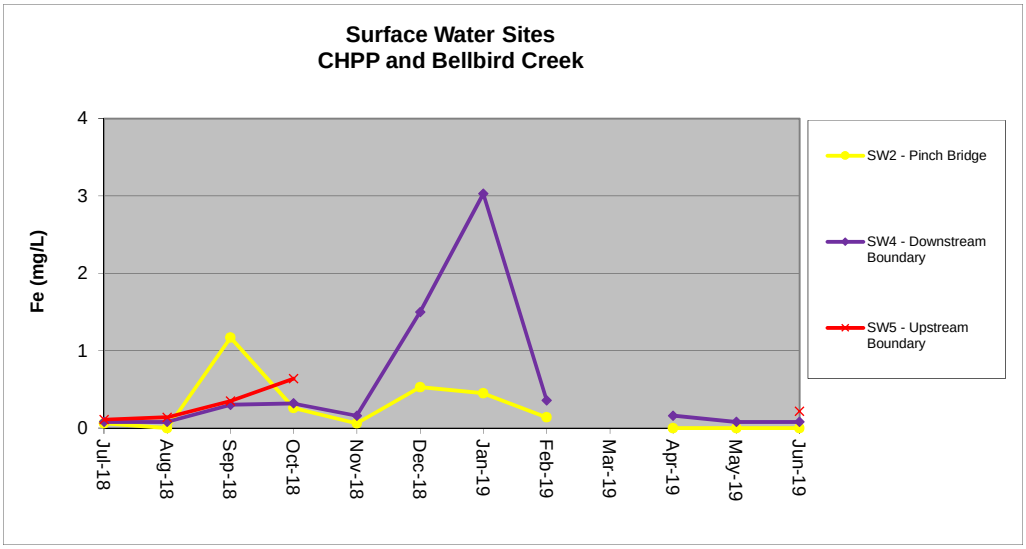

Surface Water Sites
Quorrobolong Creek and Coney Creek
EC (µS/cm)
4000
3500
3000
2500
2000
1500
1000
500
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW Q1 - Quorrobolong Creek (S Ck Rd)
SW Q2 - Quorrobolong Creek Up
SW Q3 - Quorrobolong Creek Down
SW C1 - Coney Creek

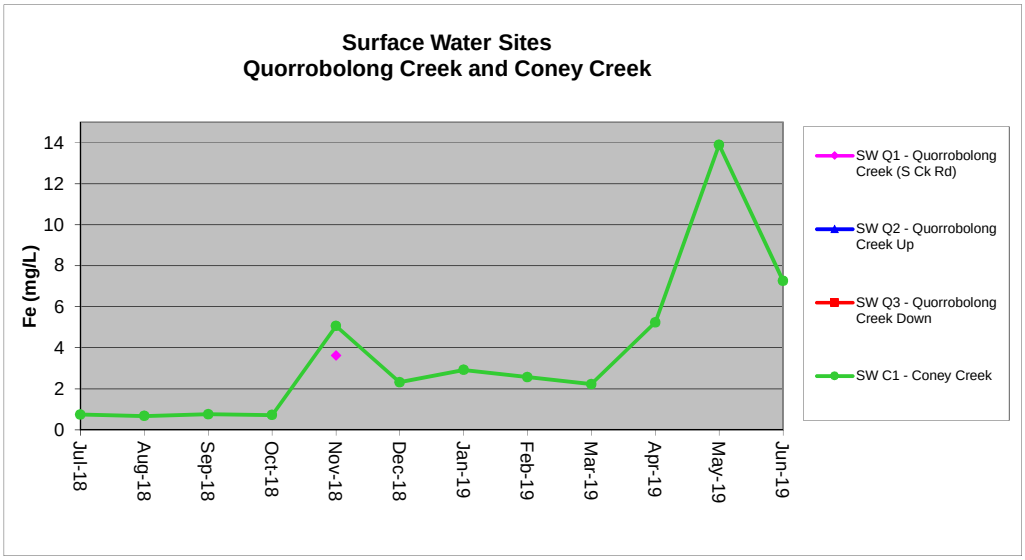

Surface Water Sites
CHPP and Bellbird Creek
TSS (mg/L)
0
10
20
30
40
50
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria


Surface Water Sites
CHPP and Bellbird Creek
TSS (mg/L)
0
2
4
6
8
10
12
14
16
18
20
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary


Surface Water Sites
Quorrobolong Creek and Coney Creek
TSS (mg/L)
0
50
100
150
200
250
300
350
400
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW Q1 - Quorrobolong Creek (S Ck Rd)
SW Q2 - Quorrobolong Creek Up
SW Q3 - Quorrobolong Creek Down
SW C1 - Coney Creek


Surface Water Sites
CHPP and Bellbird Creek
Fe (mg/L)
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria


Surface Water Sites
CHPP and Bellbird Creek
Fe (mg/L)
4
3
2
1
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary


Surface Water Sites
Quorrobolong Creek and Coney Creek
Fe (mg/L)
14
12
10
8
6
4
2
0
Jul-18
Aug-18
Sep-18
Oct-18
Nov-18
Dec-18
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
SW Q1 - Quorrobolong Creek (S Ck Rd)
SW Q2 - Quorrobolong Creek Up
SW Q3 - Quorrobolong Creek Down
SW C1 - Coney Creek

# Appendix B – Groundwater Level and Quality Monitoring Data

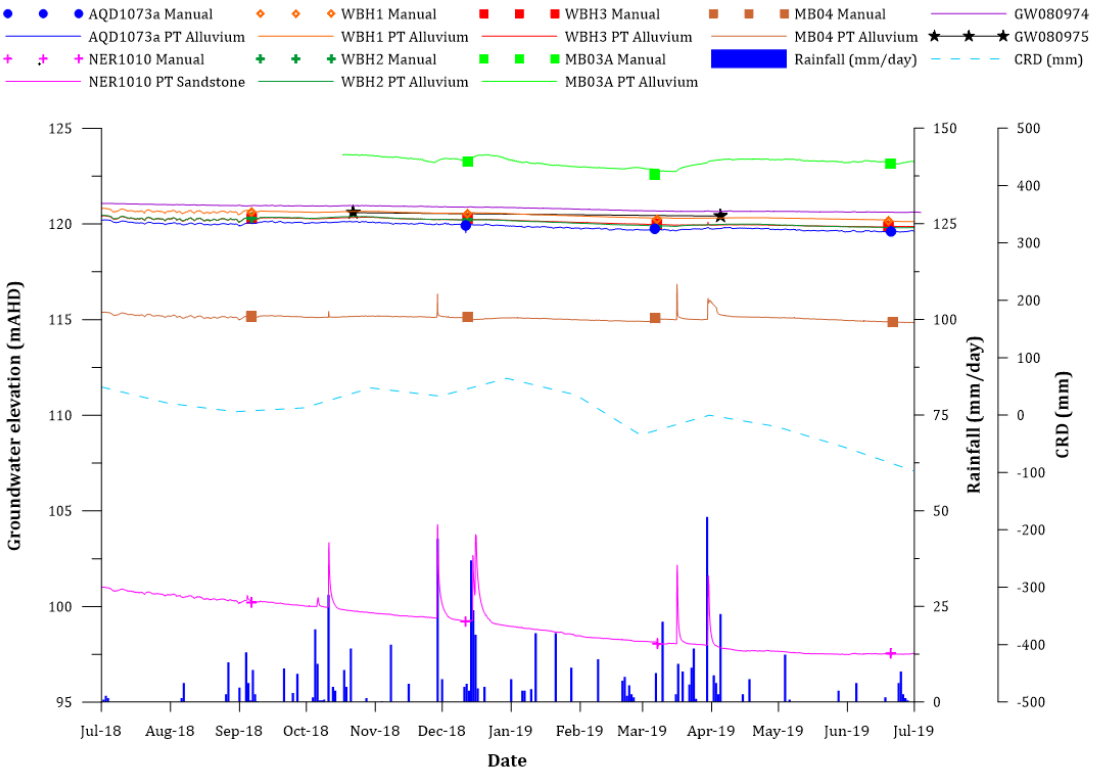



Figure 1 - Stage 2 and Bellbird South Mining Areas  Alluvium and sandstone aquifer, and WaterNSW groundwater level hydrographs

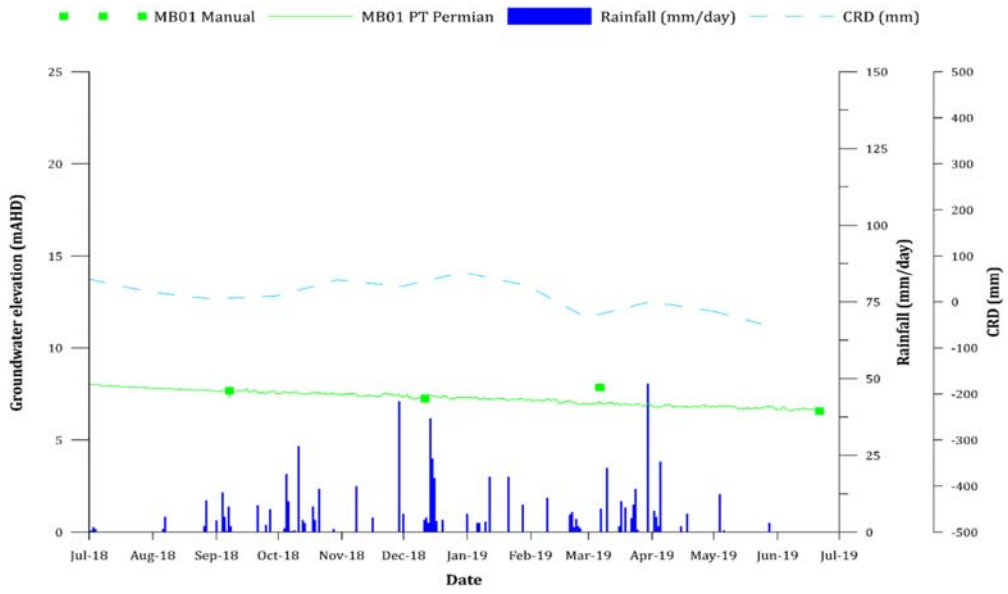



Figure 2 - Stage 3 Mining Area MB01 sandstone aquifer groundwater level hydrograph

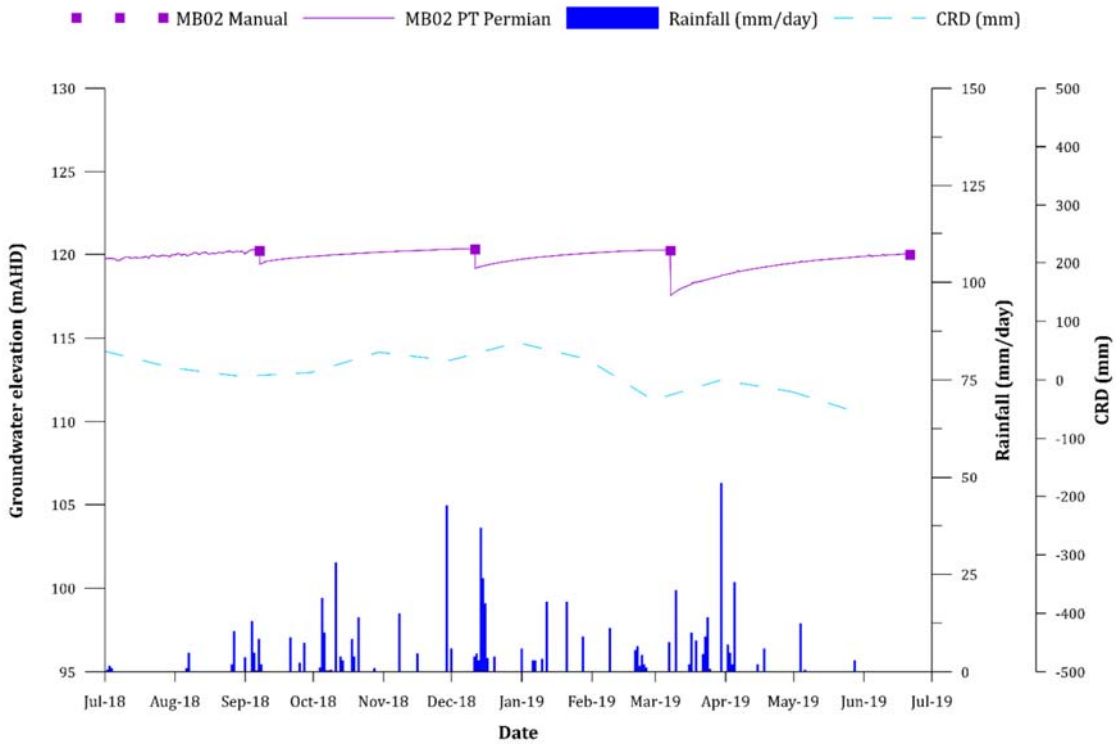



Figure 3 - Stage 3 Mining Area MB02 sandstone aquifer groundwater level hydrograph

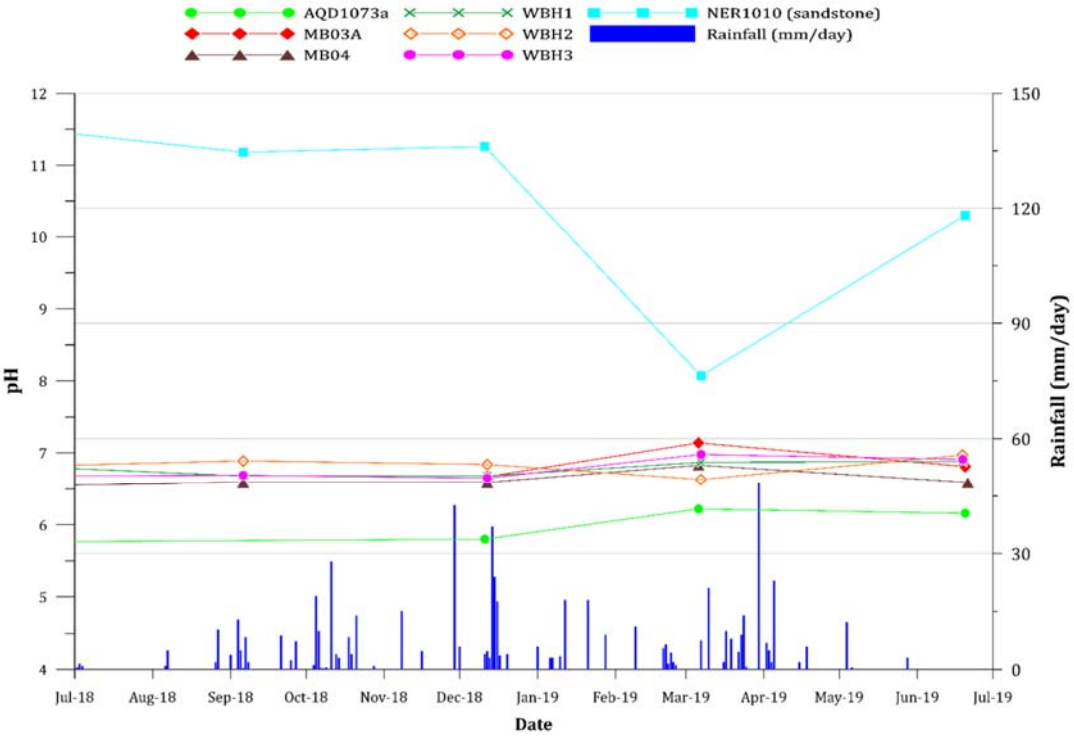



Figure 4 - Stage 2 and Bellbird South Mining Areas alluvium and sandstone aquifer pH trends

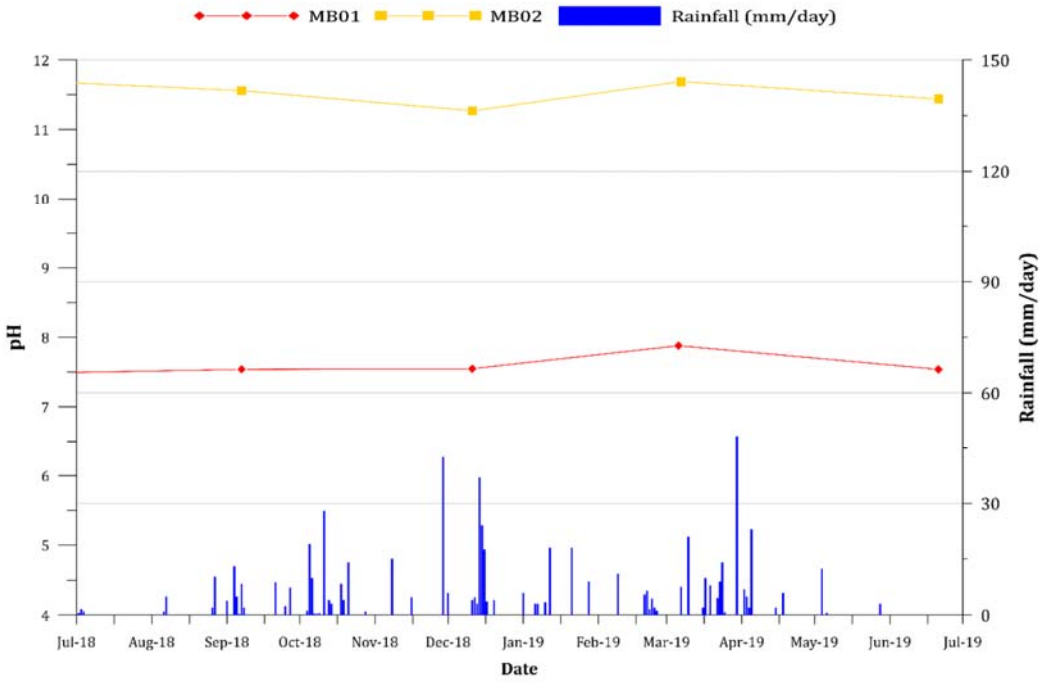



Figure 5 - Stage 3 Mining Area sandstone aquifer pH trends

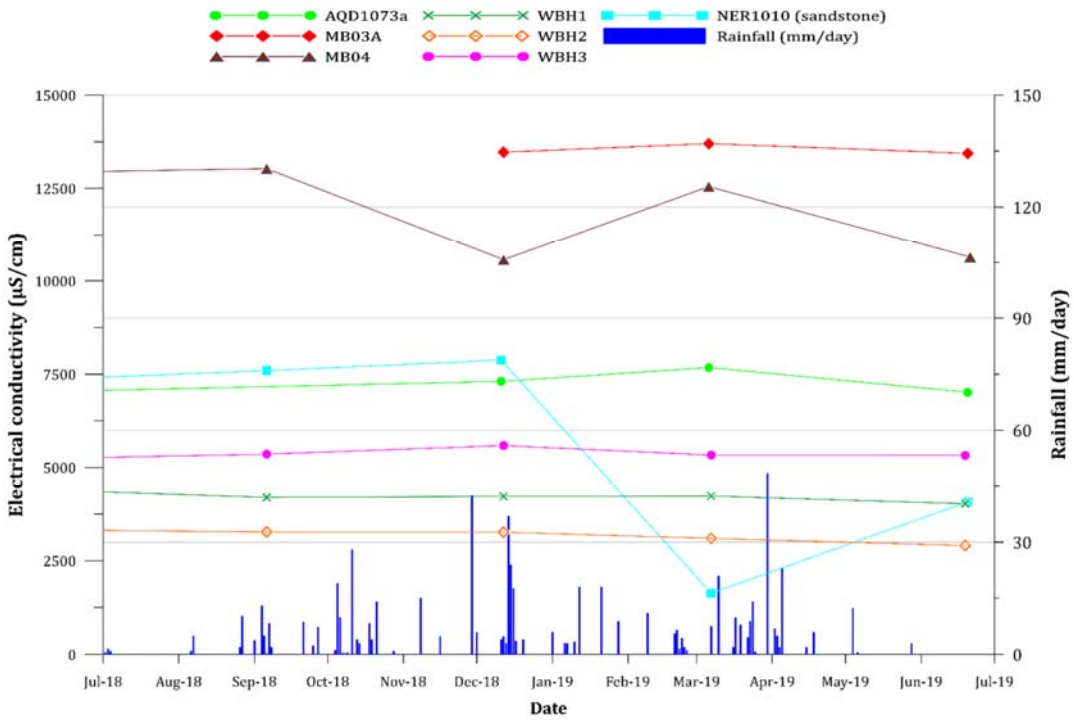



Figure 6 - Stage 2 and Bellbird South Mining Areas alluvium and sandstone aquifer EC trends

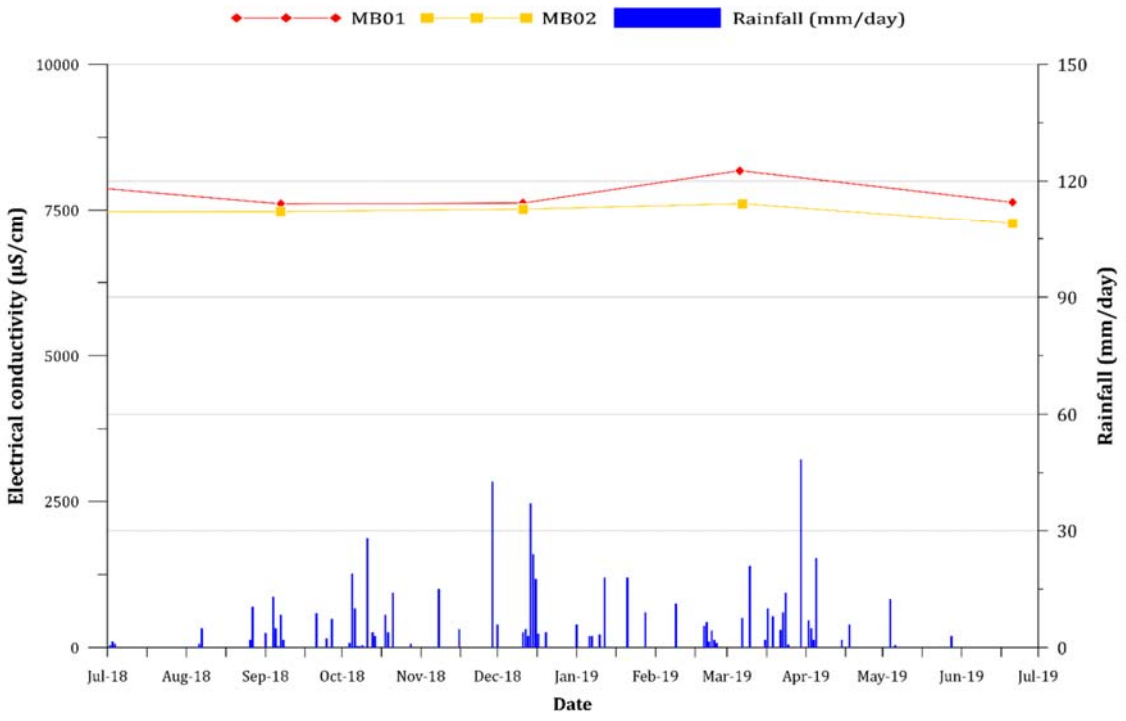



Figure 7 - Stage 3 mining area sandstone aquifer EC trends

Planning, Industry & Environment

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compliance@planning.nsw.gov.au
Our ref: DA 29/95 and MP 08_0111, as modified (Accelo #19110)

Dear Ms McCormack

**Austar Coal Mine (DA 29/95 and MP 08_0111) – ANNUAL REVIEW 2018-2019**

Reference is made to the Annual Review for the period 1 July 2018 to 30 June 2019, submitted to the Department of Planning, Industry and Environment (the Department) on 27 September 2019 as required under Schedule 5 Condition 5, and Schedule 7 Condition 3 of Project Approvals DA 29/95 and MP 08_0111 (the approvals, as modified).

The Department has reviewed the Annual Review and considers it to satisfy the reporting requirements of the approval and the Department's *Annual Review Guideline* (October 2015).

As required by Schedule 7 Condition 9 of the approval, please make publicly available a copy of the 2018 - 2019 Annual Review on the company website.

Please note that the Department's acceptance of this Annual Review is not endorsement of the compliance status of the project. Non-compliances identified in the Annual Review will be assessed in accordance with the Department's Compliance Policy. Further correspondence may be sent in relation to non-compliances.

Should you need to discuss the above, please contact Ann Hagerthy, Senior Compliance Officer, as per the details provided above.

Yours sincerely

HWatters 19/2/2020

Heidi Watters
Team Leader Northern
Compliance, Planning & Assessments