YANCOAL
兖煤澳大利亚有限公司

AUSTAR COAL MINE
PART OF THE YANCOAL AUSTRALIA GROUP

Austar Coal Mine Annual Review

July 2019 – June 2020

ANNUAL REVIEW 2020

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	June 2019
MOP end date	May 2026
Annual Review start date	1 July 2019
Annual Review end date	30 June 2020

I, William Farnworth, certify that this audit report is a true and accurate record of the compliance status of Austar Coal Mine for the period 1 July 2019 to 30 June 2020 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 9.39(2) of the Environmental Planning and Assessment Act 1979. Section 9.42 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	William Farnworth
Title of authorised reporting officer	Mining Engineering Manager
Signature of authorised reporting officer	
Date	30 September 2020

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF PLANS

TABLE OF APPENDICES

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	No
Project Approval PA 08_0111	No
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
PA 08_0111	Schedule 4, Condition 6	Requirement for an Air Quality Management Plan	Non-compliant	The TEOM and HVAS1 both had periods of time where they were not operational. The Air Quality and Greenhouse Gas Management Plan (AQGHGMP) states operation will be continuous.	**Section 6.3.2.5**
DA 29/95	Schedule 3, condition 19	Requirement for an Air Quality Monitoring Program	Non-compliant	The TEOM and HVAS1 both had periods of time where they were not operational. The AQGHGMP states operation will be continuous.	**Section 6.3.2.5**
EPL 416	Condition L1.1	Shall comply with s120 of the POEO Act (pollution of waters)	Non-compliant	The sediment dams at Kitchener Surface Infrastructure Site overtopped during a greater than design rainfall event in February 2020. The Pollution Incident Response Management Plan was enacted as the discharge water had the potential to cause pollution of waters (sedimentation). Based on the review of water sampling results from the event, there was unlikely to have been any material harm caused by the incident.	**Section 7.3.4**

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: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • 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 2019 to 30 June 2020 (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**).

Development Consent DA29/95 was granted under Section 91 of the *Environmental Planning and Assessment Act 1979* (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 infrastructure includes 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), along with water management dams, pipelines and powerlines.

The Mining Operations Plan (MOP) was approved by the Resources Regulator on 21 August 2019 and covers the period 21 August 2019 to 1 May 2026. 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 updated to reflect Austar's transition to a care and maintenance phase and was submitted to the Resources Regulator on 1 July 2020 for approval.

During the reporting period, mining was undertaken in accordance with the approved LWB4-LWB7 Extraction Plan and included mining in Longwall panels LWB5 and LWB6 in the Bellbird South mining area. Mining in LWB6 was finalised on 12 February 2020. On 30 March 2020 Austar suspended production and transitioned to a care and maintenance phase.

During the care and maintenance phase, Yancoal will continue to evaluate mining opportunities to re-commence production at Austar in the future. The workforce of 137 employees was offered various options, including voluntary redundancies, redeployment to other Yancoal Operations (both Underground and Open Cut) as well as remaining at Austar to support the care and maintenance phase.

The location of approved operations is shown in **Figure 2-1**.

The 2019 – 2020 reporting period was a significant and challenging year. The ongoing dry conditions from July 2019 continued through to February 2020, at which time higher than average rainfall eased conditions considerably.

Sustained drought conditions contributed to unusually intense bushfires throughout Australia, with severe bushfires impacting within 10kms of Austar operations, including Little L Complex and Crumps Road fires impacting Wollombi, Laguna and Congewai.

February 2020 brought relief from poor air quality, bushfire and drought with heavy rainfalls. Austar transitioned to care and maintenance on 30 March 2020, at the same time as making changes to the business to address the Covid-19 pandemic through further limitations of onsite employees and contractors, and elevated cleaning and hygiene processes.

2.3 Mine Contacts

Table 2-1 outlines the contact details for site personnel responsible for care and maintenance, rehabilitation, environmental and community liaison at Austar.

TABLE 2-1 SITE PERSONNEL

Position	Name	Company	Contact Number
Mining Engineering Manager	William Farnworth	Austar Coal Mine	(02) 4993 7356
Environment & Community Superintendent	Carly McCormack	Austar Coal Mine	(02) 4993 7334

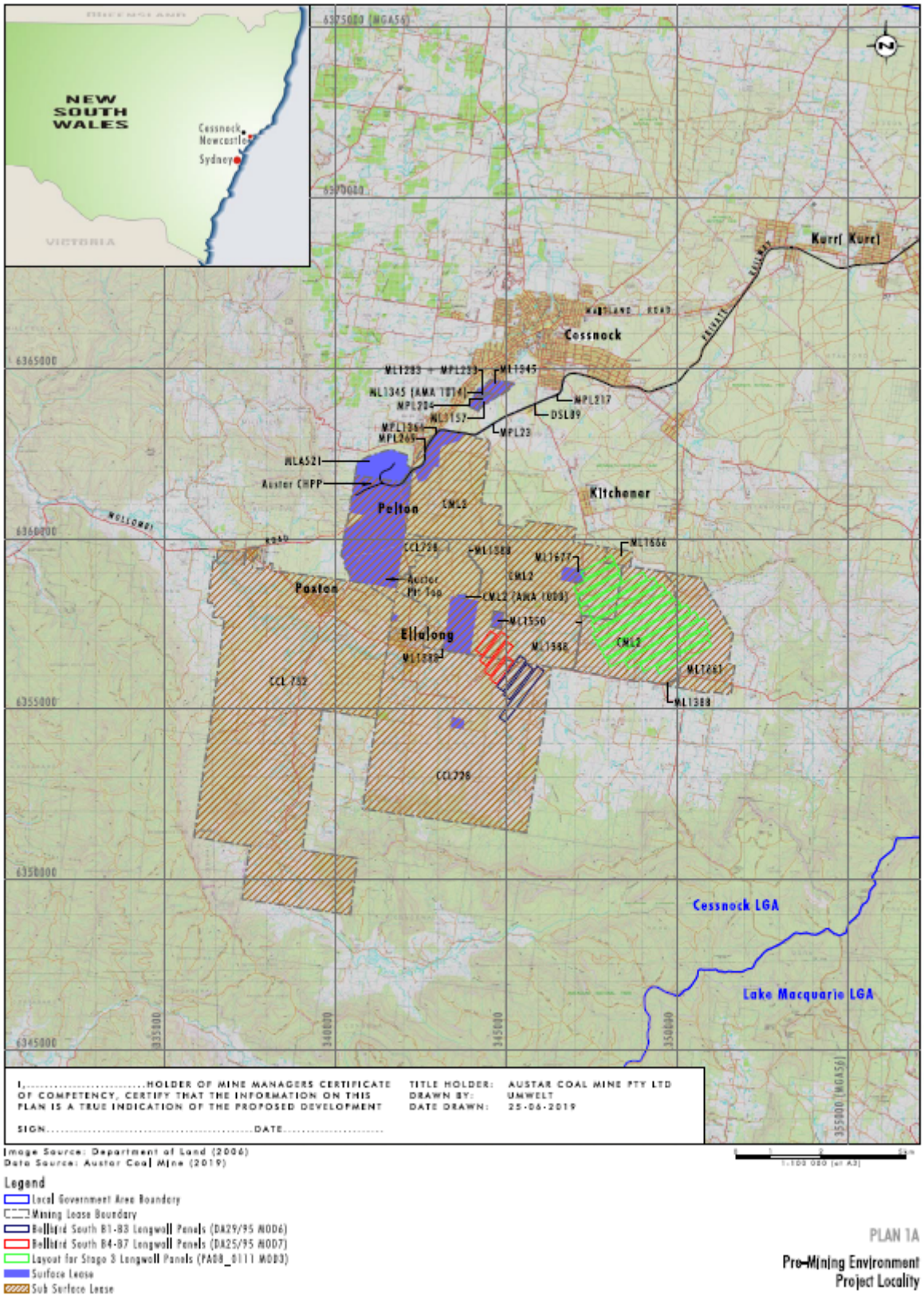


Figure 2-1 Locality Plan and Approved Mining Operations

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 the potential risk to the safety of workers caused by geological factors, including fault displacement of greater than half the seam depth in longwall panels LWB5 – LWB7, Austar applied to the Department of Planning, Industry and Environment (DPIE) to shorten the finishing ends of these panels. The variations to the longwall panels were approved by DPIE in August 2019.

3.2 Primary Approvals

3.2.1 Development Approval

A summary of Austar's development approvals is 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. Extension of underground mining activities into Bellbird South area (CML 2). Mine life of 21 years with a production of 3 Million tonnes per annum (Mtpa). Reject emplacement. Construction and operation of a new infrastructure site including new ventilation shaft and fan(s) (No. 2 Shaft) adjacent to Sandy Creek Road. Use of Pelton CHPP for washing and handling of coal. Provision of a maximum raw coal stockpile of 100,000 t. Reopening of disused Cessnock No. 1 Colliery shafts for ventilation and access, or the sinking of new shafts, as required. Construction of various water management devices including sedimentation and clean water dams and drainage systems.

Consent Description	Date	Expiry	Approval Authority	Summary of Approved Development
DA 29/95 (Modifications)	27 September 2006 (MOD 1) 8 Jun 2008 (MOD 2) 28 May 2009 (MOD 3) 7 Dec 2010 (MOD 4) 27 April 2012 (MOD 5) 29 January 2016 (MOD 6) 25 August 2017 (MOD 7)	14 Feb 2022	Minister for Planning	Extension of Underground Mining Activities into Bellbird South (Ellalong Colliery) – Modification. Use of long wall top coal caving (LTCC) mining methods in two longwall panels. Installation of a larger capacity fan at the site approved for DA 8/1999/1658. Installation of a new downcast ventilation shaft. Installation of a new 10 MVA substation. Installation of a nitrogen inertisation plant with a 2,000-cubic metre capacity. Provision of a diesel and emulsion fluid storage area and dispatch system. Installation of a tube bundle shed to house electronic monitoring equipment. Upgrade of the existing water treatment plant. Upgrade of water reticulation and pumps. Minor embankment stabilisation works at Kalingo Dam. Longer and wider panels A4 and A5. Extract one additional Longwall Panel A5a (LW A5a). Extension of Longwall Panel A5a Extension to Bellbird South development consent area to include Longwall panels LWB1 to LWB7. 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: Longwall production from the Greta coal seam from panels A6 to A17 using LTCC. 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. Coal will continue to be brought to the surface at Austar's existing surface

Consent Description	Date	Expiry	Approval Authority	Summary of Approved Development
				facilities at Paxton. These facilities will continue to be used to take large mining equipment into and out of the mine. Continued use of Austar's existing water management, coal transport systems, coal preparation plant and rejects emplacement areas.
Project Approval 08_0111 (Modifications)	4 May 2010 (MOD 1) 13 March 2012 (MOD 2) 17 Dec 2013 (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. 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. 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: Approval for underground coal mining. Construction of a new access drift, upcast shaft and ventilation shaft. Expansion of the Pelton CHPP. Conveyance of coal from the Ellalong pit top to the Pelton CHPP Operation for the washing and handling of coal. Water management systems. Upgrade of the Pelton rail loading facility and railway spur. 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. 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. Extension of open cut mining area. 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. Upgrade and replacement of coal handling infrastructure such as surge bin, automatic stacking system, reclaim facilities and skyline conveyor. Increase in stockpile capacity. Upgrade to water management system. Extension of the reclaim tunnel. Construction of a mine water transfer pipeline from Ellalong Colliery to Pelton. Provision of underground workings for emergency mine water disposal. Upgrade of lime treatment plant.
DA 118/693/42	26 Nov 1993	Nil expiry	CCC	Extension of Pelton Open Cut Mine. 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. Extension to the bathhouse at the Ellalong drift site. Extension of existing offices or construction of portable offices. 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. Installation of a ventilation shaft and fan house. 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	13/07/2021	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	07/12/2039	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	ML – 3406ha, AMA 2.528ha	Various	Various
Mining Lease No. 1345 (1992)	23/03/1995	30/12/2023*	ML – 41.9ha, AMA 0.5659 ha	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 Title (Act)	Date Granted	Expiry Date	Area (ha)	Surface	Depth Restriction
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	22/08/2033	9.16	Yes	Surface to 30.48 metres
Mining Lease Application No. 521 (1992)	Lodged February 2016	Pending Approval	115	Yes	Surface to 50m

*Renewal documents lodged June 2020

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

During the reporting period, the Extraction Plan for LWB4 to LWB7 was varied to include a revised longwall layout (reduced finishing ends for LWB5 to B7 and reduced width of LWB7). The variation was approved by DPIE on 7 August 2019.

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 and the Stage 3 mining 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	DRE	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.

Description	Date	Expiry Date	Approval Authority	Approval Summary
SMP Variation Approval 13/1876	7 Jan 2014	31 May 2020	DRE	Subsidence Management Plan approval for Austar Longwalls A7 to A10 to correspond to PA08_0111 MOD and retraction to LWA8 start position.
SMP Variation Approval 13/1876	19 Feb 2014	31 May 2020	DRE	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 on 4 July 2016
Extraction Plan LWB4 to LWB7	1 February 2019	Not specified	DPIE	Extraction Plan for Bellbird South Longwalls B4 to B7 approved on 20 September 2017. Updated to include the shortening of LWB4 was approved on 18 September 2018 and again on 12 February 2019. Other variations to Longwalls B5-B7 were approved on 7 August 2019

3.3.2 Mining Operations Plan

Pursuant to the *Mining Act 1992*, Austar conducts 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 June 2019 to May 2026.

MOP Amendment A was prepared in June 2020 to reflect the change in operations to a care and maintenance phase and lodged with Resources Regulator for approval on 1 July 2020. MOP Amendment A was prepared after consultation with the Resources Regulator, who issued a notice under s240 of the *Mining Act 1992* to prepare and lodge the amended MOP. MOP Amendment A includes new commitments to progress a mine closure planning strategy for the Austar Coal Mine.

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.

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 PA08_0111 - Schedule 7 Condition 1	DPIE	1 August 2018
Environmental Monitoring Program, June 2018	DA29/95 – Schedule 5 Condition 2 PA08_0111 - Schedule 7 Condition 1	DPIE	1 August 2018
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 PA08_0111 – Schedule 4 Condition 9	DPIE	1 August 2018
Noise and Vibration Management Plan, June 2018	DA29/95 – Schedule 3 Condition 13-16 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 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. Extensive landholder engagement was undertaken to secure Land Access and Compensation Agreements for potential exploration drill sites on private landholdings. This was undertaken in preparation for a proposed exploration drilling program in the next reporting period, with up to five boreholes planned to be drilled.

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 yearly covering the period 13 July – 12 July. The report describes exploration activities and/or mining operations carried out on or within EL6598 and was lodged with DPIE in August 2020 detailing activities undertaken during this reporting period.

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 that time.

Extraction of longwall panel LWB5, within the Bellbird South mining domain, commenced 17 January 2019 and was completed 21 August 2019. The longwall equipment was then relocated to longwall panel LWB6 where extraction began 27 September 2019 and was completed 12 February 2020. Following completion of LWB6, all longwall equipment was transported to the surface, and serviced, cleaned and stored. Austar transitioned to a care and maintenance phase on 30 March 2020, leaving two panels in the approved Bellbird South mining area (LWB1 and LWB7) and the remainder of the approved Stage 3 panels yet-to-be extracted.

During the reporting period, the shortening of LWB5, LWB6 and LWB7 was approved by DPIE. The application to reduce the length of these longwalls was necessary to minimise potential operational safety risks due to fault displacement within the seam.

Mining undertaken during the 2019 – 2020 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, within Kalingo Infrastructure Area.

Monitoring data indicates low levels of seam gas emissions comprising carbon dioxide (CO_2) (2019-20 Average 0.16%) and methane (CH_4) (2019-20 Average 0.03%). Results are variable throughout the year and can depend on external factors such as fan speed and other operating conditions. During Q4 of the reporting period, fans speed was slowed when the mine transitioned to care and maintenance as less ventilation volume is required under this phase.

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 2019-20 reporting period.

TABLE 4-1 PRODUCTION AND WASTE SUMMARY

Material	Approved Limit (PA 08_0111)	2018-2019 Previous Reporting Period	2019-2020 Current Reporting Period	2020 – 2021 Next Reporting Period (Forecast)
Waste Rock / Overburden	N/A	N/A	N/A	N/A
Fine Reject (Tailings) (ML)	-	155,296	110,127	-
Coarse Reject (t)	-	20,000	18,566	-
ROM Coal (t)	3,600,000	705,352	1,034,297	-
Saleable Product (t)	-	595,231	850,275	-

During the reporting period, coal was processed at the Austar CHPP. Fine tailings were transported by pipeline to 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 mine 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 850,275 tonnes of product coal from Austar was transported 65km 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 up to 30 March 2020. Care and maintenance activities commenced on 30 March 2020 and were also undertaken 24 hours per day, seven days a week at the mine, and weekday day shift only at the CHPP.

4.5 Waste Management

Waste collected during the reporting period 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
2019-20	6.39	1.2	1.05	73.5	24.5	0.62	0.17	0.24	274.36	217.62	0.06
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 remained relatively consistent when compared to the previous reporting periods, except for oily water disposal, which increased substantially. Oily water tonnages, which include solcenic fluid, increased this reporting period due to draining of fluid for disposal from the longwall equipment when it was dismantled and brought to the surface for storage. A maintained focus on effective waste management has led to stable waste volumes even though the transition to care and maintenance occurred during the reporting period.

Waste contractors undertake weekly inspections of waste bins, oil storage areas and spill kits and report any issues to Austar staff. If cross contamination is an ongoing issue, or a waste improvement opportunity 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, Austar hope to gain approval from the Resources Regulator for MOP Amendment A, which reflects the mine's transition to a care and maintenance phase. The amended MOP includes new commitments to progress a mine closure planning strategy for the Austar Coal Mine.

The Independent Environmental Audit will be conducted during October and November 2020. Environmental Management Plans will be reviewed and updated as required.

An exploration drilling program will be undertaken in the second half of the next reporting period within EL 6598.

Rehabilitation monitoring and maintenance will continue to be undertaken. Land management activities, including weed management, and maintenance of firebreaks will continue.

Mine maintenance works, including gantry repairs and dam desilting will be undertaken over the next two reporting periods.

5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

DPIE reviewed the 2018-19 Annual Review and 'considers it to satisfy the reporting requirements of the approval and the Department's Annual Review Guideline (October 2015)'. No actions were requested by the DPIE in their response dated 19 February 2020. Resources Regulator noted receipt of the 2018-19 Annual Review on 29 October 2019.

Actions committed to by Austar in the 2018-19 Annual Review are 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
Aberdare Emplacement Area continued capping, topsoiling and seeding	2018-19 Annual Review	Complete	Capping, topsoiling and seeding was undertaken during the reporting period.	**8.1**
Independent Environmental Audit planning and preparation. Continue to address the findings and actions of the 2017 Independent Environmental Audit.	2018-19 Annual Review	Progressing	Planning for the 2020 Independent Environmental Audit has commenced, and actions from the previous audit have been progressively closed out.	**10**
Finalise geotechnical studies undertaken at Aberdare Emplacement Area and propose appropriate capping thickness to Resources Regulator	2018-19 Annual Review	Progressing	Rehabilitation was completed during the reporting period in accordance with the recommendations of the geotechnical studies. The geotechnical study assessing the capping layer requirements found that for a managed grassland a 1 metre cap would be suitable for emplacement areas. A number of actions were proposed to further support the 1 metre capping thickness.	**8.4**

Action Required from Previous Annual Review	Requested by	Status	Action taken by Austar	Where discussed in Annual Review
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.	2018-19 Annual Review	Closed	During the reporting period, further rehabilitation monitoring was undertaken in this area to guide the final landuse of the Area 12 and 13 rehabilitation areas. Surface flow reinstatement was reviewed and is not feasible until Cessnock City Council implement flood mitigation options for Bellbird Creek as outlined in the *Final Cessnock City (Black Creek) Floodplain Risk Management Study and Plan Report W4951* (February 2016).	**3.3.2**
Progress heritage assessments to support demolition of existing structures and foundations at Bellbird, Pelton, and Cessnock No. 1 (Kalingo) Collieries.	2018-19 Annual Review	Closed	The need for and timing of historic heritage assessments has been identified as part of the closure planning process in the MOP Amendment A submitted to Resources Regulator on 1 July 2020 for approval.	**6.7.1**
Continued implementation of noise pollution reduction program (PRP) at the Austar CHPP.	2018-19 Annual Review	Suspended	Further sound power testing was undertaken on-site at the CHPP, following recommendations of the sound power review. A noise control options analysis was completed and the CHPP noise model updated. Austar transitioned to a care and maintenance phase before the model could be validated. As such Austar has proposed to the EPA to suspend the PRP until operations resume.	**6.6**
Phase 1 Contamination Assessment to be reviewed and actions considered.	2018-19 Annual Review	Closed	The need for and timing of contamination assessments will be further assessed as part of the closure planning process commitments made in MOP Amendment A submitted to Resources Regulator on 1 July 2020 for approval.	-

Action Required from Previous Annual Review	Requested by	Status	Action taken by Austar	Where discussed in Annual Review
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.	2018-19 Annual Review	Suspended	Currently, capped areas drain to the centre of the emplacement area with captured mine water disposed to historic underground workings. Design of the clean water diversion drain has not been finalised due to topographical constraints. Aberdare reject emplacement area will be maintained in its current form during the care and maintenance period.	**8.1.1-**
NER1010 groundwater monitoring bore will be investigated with a downhole camera to assess the condition of the bore (s7.4.2)	2018-19 Annual Review	Complete	NER1010 was investigated. Results are discussed in this Annual Review.	**7.4.2.1**
Report on results of the modified groundwater monitoring program undertaken during 2019 as recommended in the Historical Groundwater Review and Assessment Report (s7.4.2)	2018-19 Annual Review	Complete	The modified groundwater monitoring program was completed in December 2019 and a report on the findings submitted to DPIE on 27 May 2020.	**7.4.2.2**

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. Numerous elevated dust results were recorded during the reporting period, however were determined to be the result of regional dust storms and bushfire events, and not the result of Austar operations.	There was one complaint related to air quality from a resident of West Cessnock during capping activities at Aberdare Emplacement Area. A number of elevated dust results were reported to the DPIE, however these were not due to Austar's operations and no further actions have been required. The TEOM and HVAS1 both had outages that were communicated to DPIE during the reporting period and noted as a non-compliance with the AQGHGMP.	Air Quality will continue to be managed in accordance with the AQGHGMP.
Biodiversity (**Section 6.4**)	Refer **Section 6.4** for detail on EIS predictions.	Compliant with DA29/95 and PA08_0111.	No observable impacts as a result of longwall mining were identified.	Ecological monitoring will continue in accordance with the relevant Extraction Plan Biodiversity Management Plans.
Vibration and Blasting (**Section 6.5**)	Refer **Section 6.5** for detail on monitoring criteria.	Compliant with DA29/95 and PA08_0111.	Non-mandatory night time maximum criteria was exceeded once during the reporting period.	Vibration and blasting will continue to be monitored and managed in accordance with the Noise and Vibration

Aspect	Approval Criteria / EIS Prediction	Performance During the Reporting Period	Trend / Key Management Implications	Implemented / Proposed Management Actions
				Management Plan (NVMP) when operations recommence.
Noise (**Section 6.6**)	Refer **Section 6.6** for detail on approval criteria.	There were no exceedances of EPL noise criteria at the CHPP in the reporting period.	As Austar has moved to a care and maintenance phase, there is reduced noise from operations.	Noise monitoring and management will continue in accordance with the NVMP.
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.	Observed subsidence resulting from the extraction of longwall panels LWB4-LWB6 was generally similar to or less than the maximum predicted subsidence. The profiles of	Continue to monitor and manage subsidence impacts in accordance with the Extraction Plan and Subsidence Monitoring Program. Subsidence in the Bellbird

Aspect	Approval Criteria / EIS Prediction	Performance During the Reporting Period	Trend / Key Management Implications	Implemented / Proposed Management Actions
			observed subsidence also reasonably matched those predicted, but with reduced magnitudes.	South mining area (LWB2-LWB6) should be substantially complete in the next reporting period. Subsidence monitoring will be undertaken to confirm.
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 event occurred in February 2020 where the Kitchener SIS sediment dams overtopped in a greater than design rainfall event. The PIRMP was enacted as the discharge had the potential to cause pollution of waters (sedimentation). An incident report was provided to the EPA, DPIE and Resources Regulator. Based on the review of water sampling results from the event, there was unlikely to have been any material harm caused by this event.	Monitoring of the Investigation Drainage Line at the CHPP continued in accordance with the EPL PRP. Surface water quality trends indicate no adverse mining impacts on the water quality of the local waterways. There have been no community complaints in relation to water quality during the reporting period. No TARPs under the SWMP were triggered.	Surface water monitoring and management will continue in accordance with the SWMP.
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. No TARPs	Groundwater monitoring and management will continue in accordance with the SWMP and relevant Extraction Plan Water Management Sub-Plans.

Aspect	Approval Criteria / EIS Prediction	Performance During the Reporting Period	Trend / Key Management Implications	Implemented / Proposed Management Actions
			under the SWMP were triggered. Additional monitoring was undertaken during the reporting period, along with some remediation works on three groundwater monitoring boreholes.	
Erosion and Sediment Control	PA 08_0111 requires an Erosion and Sediment Control Plan as part of the SWMP.	Operations remained compliant with the SWMP during the reporting period. There was one event reported to regulators in February when the Kitchener SIS sediment dams overtopped in a rainfall event that exceeded the design capacity of the sediment dams. Resources Regulator inspected the site after notification. No further action has been taken. Monthly inspections are undertaken which incorporate inspections of erosion and sediment control and drainage lines. During the reporting period, the sediment control structures at the Kitchener SIS	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 monitor the sediment control structures for capacity, structural integrity and effectiveness.	Erosion and sediment controls will continue to be managed in accordance with the SWMP.

Aspect	Approval Criteria / EIS Prediction	Performance During the Reporting Period	Trend / Key Management Implications	Implemented / Proposed Management Actions
		were cleaned out and replaced as required.		
Hydrocarbon management	Not applicable.	There were no reportable incidents in relation to hydrocarbon management during the reporting period. The hydrocarbon remediation area was managed to ensure no contamination to nearby areas. 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 generally in accordance with Australian Standards and EPA guidelines. Austar operates a hydrocarbon remediation area at the CHPP to manage hydrocarbon contaminated material recovered from the site. The area is signposted and has three bunded cells for segregation of materials of different ages and source locations. The bunded area was constructed on a disused laydown area and is within the sites mine 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.	A Weed Action Plan was developed during the reporting period that recorded weed infestations across Austar lands and made recommendations on implementing weed control operations in a systematic manner. Weeds controlled during the reporting period included Mother of Millions in all known locations, and Green Cestrum, Lantana, Tobacco Bush and other environmental weeds in rehabilitation areas and CHPP lands.	Weed infestations are managed according to the Weed Action Plan. During the next reporting period, weeds will continue to be monitored in monthly inspections and controlled as per the Weed Action Plan recommendations. Signs of feral animal infestations are monitored for during monthly inspections. Ad hoc sightings of feral animals are also reported by operational personnel. Feral animal management is undertaken on an as needs basis.	Weeds and feral animals will be treated according to good land management practices and the Weed Action Plan.
Visual Amenity and Lighting	Reject emplacement areas will be constructed to minimise visual impacts upon residents in the vicinity and from roads. Emplacement areas may include bunds and buffer zones to minimise visual impact.	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
	Screening will be used as required. Lighting will be positioned to shine into the Kitchener SIS and light shields will be used where practical.			
Historic Heritage	There are a number of heritage items across Austar infrastructure areas of the site that require ongoing management or possible future 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. There was no restoration or demolition works on any Austar owned heritage structures during the reporting period.	No work on any heritage structure is to occur without prior advice from a heritage consultant and approval from the relevant authority.	The need for and timing of historic heritage assessments has been identified as part of the closure planning process in the MOP Amendment A submitted to Resources Regulator on 1 July 2020 for approval.
Spontaneous Combustion	Monitoring and response procedures will be used to minimise spontaneous combustion issues.	There were no spontaneous combustion events during the reporting period. A geotechnical assessment found coarse rejects within the Aberdare and East Pit emplacement areas have a low risk of spontaneous	Spontaneous combustion is managed through the reject haulage and emplacement area procedure and routine inspections. Reject emplacement areas will continue to be monitored and managed during the care and maintenance phase. The ROM	Monitoring for outbreaks of spontaneous combustion will continue and outbreaks will be responded to as required.

Aspect	Approval Criteria / EIS Prediction	Performance During the Reporting Period	Trend / Key Management Implications	Implemented / Proposed Management Actions
		combustion when compared to the NSW EPA Resource Recovery Order concentrations for combustible content.	and clean coal stockpiles have been cleared and remain empty during care and maintenance.	
Bushfire	Maintain Asset Protection Zones (APZs) and Strategic Fire Advantage Zones (SFAZs) in accordance with Bushfire Management Plan.	Austar continued to monitor and maintain access tracks, 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. During the reporting period, the CHPP meteorological station was upgraded to allow remote log in and download, as well as provide a useful dashboard function for broader use on site.

This section summarises the meteorological data for the 2019-2020 reporting period.

TABLE 6-2 WEATHER SUMMARY 2019-2020

Month	Rainfall (mm)	Rain days (>0.2mm)	Maximum temperature (^{0}C)	Minimum Temperature (^{0}C)	Mean wind speed (m/s)	Max wind speed (m/s)	Dominant wind direction
Jul	13.4	12	22.2	0.1	0.5	15.2	NNW
Aug	37.4	5	24.9	-0.7	0.8	17	SW
Sep	45.8	10	31.7	4.1	0.7	18.3	E
Oct	3.6	5	34.9	5	0.6	16.5	E
Nov	20.2	3	37.7	7.2	0.8	19.7	E
Dec	0	0	42.8	10.1	0.7	19.2	E
Jan	26.6	15	43.9	15.6	0.7	14.8	E
Feb	157.4	14	43.8	12.9	0.6	11.6	E
Mar	99.6	14	36.3	11.3	0.5	10.7	E
Apr	40.6	8	27.8	7.3	0.3	14.8	NNW
May	33	12	25.1	2.8	0.3	9.7	SW
Jun	44.8	8	21.1	3.4	0.4	8.3	SW

The total monthly rainfall, number of rain days and cumulative rainfall during the reporting period is shown in **Table 6-2** and **Figure 6-1**. An Annual wind rose is provided in **Figure 6-2.**

A total rainfall of 522mm was recorded during the 2019-20 reporting period. This represents an increase of 85mm from the previous reporting period, however is still significantly under the annual average rainfall for the Cessnock area (720.5mm) (Bureau of Meteorology Cessnock Airport AWS 1968 - 2020). Predominant winds were from the East and South West during the year.

Sustained hot, dry conditions along with gusty winds and resulting bushfires from September – January contributed to poor air quality in the region during 2019 and early 2020.

February recorded the highest rainfall of any month in the reporting period (157.4mm), which helped ease bushfire threats and reduced regional particulate matter loads.

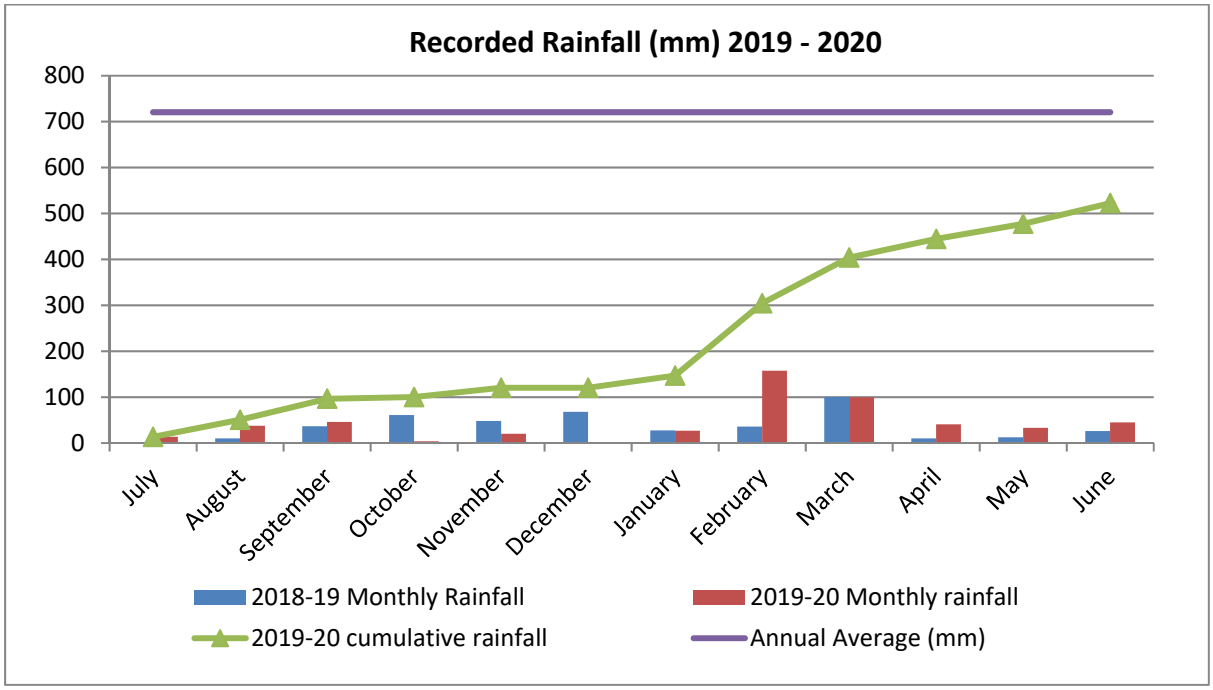


FIGURE 6-1 RECORDED RAINFALL (MM) AT AUSTAR METEOROLOGICAL STATION 2019-2020

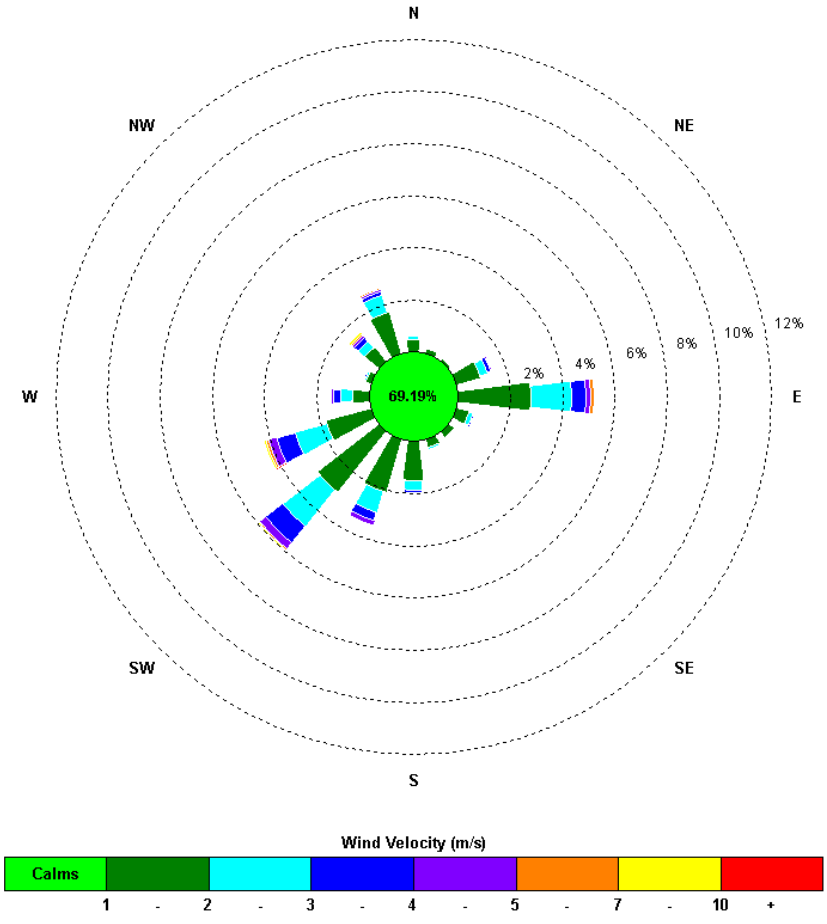


FIGURE 6-2 ANNUAL AVERAGE WIND ROSE 2019-2020

6.3 Air Quality

6.3.1 Environmental Management

Austar implements an Air Quality and Greenhouse Gas Management Plan (AQGHGMP) 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 updated in June 2018 and approved by the Department of Planning and Environment (DPE) on 1 August 2018.

During operations, 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, most of the site is stable, and does not generate excessive dust.

During the transition to care and maintenance, the ROM and clean coal stockpiles were cleared and the surface compacted to prevent wind and water erosion. In care and maintenance, a water cart or water sprays will continue to be utilised to minimise dust on roads and stockpile areas when maintenance works are being undertaken if required.

The AQGHGMP 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 6-3** and shown on **Figure 6-3**.

TABLE 6-3 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

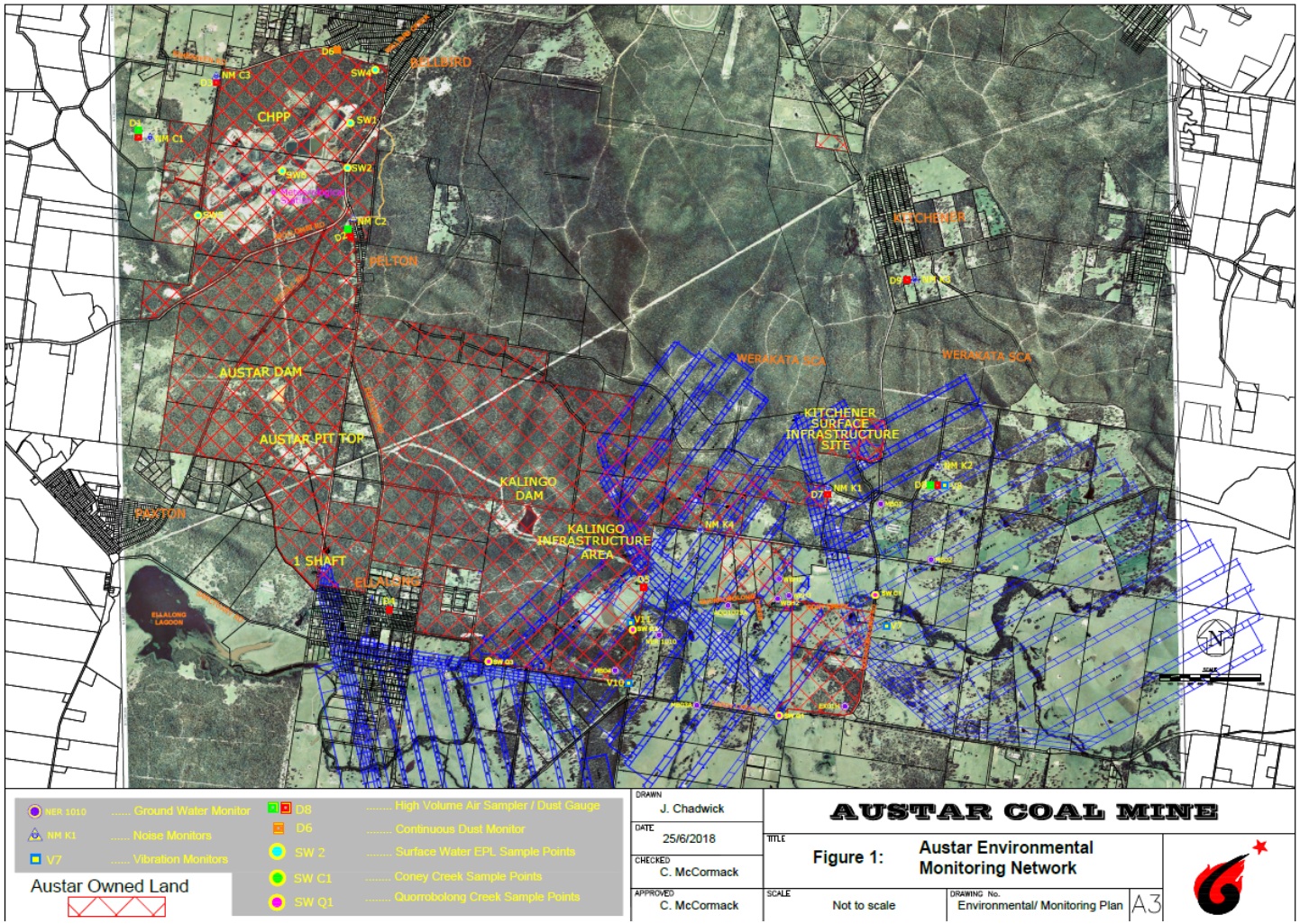


FIGURE 6-3 AUSTAR ENVIRONMENTAL MONITORING NETWORK

reporting period is provided below, followed by a summary of exceedances and a commentary on results.

The NSW Annual Air Quality statement (https://www.environment.nsw.gov.au/topics/air/air-quality-statement) 2019 states:

> Air quality in New South Wales (NSW) was greatly affected by the continuing intense drought conditions and unprecedented extensive bushfires during 2019.
>
> The bushfire emergency saw around 4 million hectares burnt in NSW from July to December 2019, resulting in widespread smoke impacts on many regions through Spring and early Summer. In addition, continuing intense drought has led to an increase in widespread dust events throughout the year. A further source of particles came from hazard reduction burns in and around Sydney in the cooler months.

From September, regional dust storms and atmospheric smoke from north coast fires contributed to poor air quality in the region. From November through to January, thick smoke haze was a regular occurrence at Austar, due to the bushfires burning in the local and regional areas. These conditions are reflected in the fine particulate monitoring from September through to January, where particulate matter levels increased substantially, with over 30 exceedances of the short-term air quality criteria reported to the DPIE. None of these elevated results were attributed to Austar's operations.

6.3.2.1 Dust Deposition

Table 6-4 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.

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 2018-2019 reporting year as shown in **Table 6-4**. The maximum increase of recorded annual average insoluble solids at any one location from last reporting period to this reporting period was 0.8g/m^2/month at dust monitor D9 near Kitchener Village.

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 eight (8) instances when the monthly dust deposition gauges were contaminated with bird droppings, insects or vegetative matter, and these results were excluded from the annual average calculation. Dust Gauge D5 was contaminated for three (3) months during the reporting period, predominantly with bird droppings.

TABLE 6-4 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 Total Insoluble Solids (g/m^2/month)					Change in Deposited Dust 2018-19 to 2019-20 Period (g/m^2/month)
				2015-16	2016-17	2017-18	2018-19	2019-20	
D1	Mount View	0.2 – 2.7*	4 g/m^2 /month (maximum total deposited dust)	0.9	0.8	0.9	1.2	1.4	0.2
D2	Pelton	0.2 – 2.7*		1.4	1.4	1.1	1.5	1.9	0.4
D3	Mount View	0.2 – 2.7*		0.9	1.1	0.7	0.8	1.3	0.5
D4	Ellalong	n/a		2.7	1.6	1.6	1.4	1.6	0.2
D5	Kalingo Infrastructure Area	n/a	2 g/m^2 /month (maximum annual increase in deposited dust)	3.3	1.5	0.7	1.8	1.3	-0.5
D7	Quorrobolong	1.5 – 1.65^		0.9	0.9	1.2	1.1	1.3	0.2
D8	Quorrobolong	1.5 – 1.63^		0.6	0.9	0.9	0.7	1.4	0.7
D9	Kitchener	n/a		0.9	0.8	1.3	0.9	1.7	0.8

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)

6.3.2.2 Total Suspended Particulates

The annual average total suspended particulates (TSP) results for the reporting period are provided in **Table 6-5**.

TABLE 6-5 TSP HVAS AND TEOM RESULT ANNUAL AVERAGES FOR CURRENT AND PREVIOUS YEARS

ID	Location	Annual Average TSP ($\mu g/m^3$)					
		EA Prediction	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
TEOM	Bimbadeen Road, Mount View	n/a	23.8	25.3	28.5	33.4	56
HVAS1	Pyne Way, Mount View	n/a	27.5	28.0	32.0	42.8	62.8
HVAS2	Ellalong Road, Pelton Village	n/a	31.3	30.0	39.4	47.7	62.0
HVAS3	Coney Creek Lane, Quorrobolong	32.53	24.1	24.5	29.5	39.0	53.8

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 AQGHGMP.

6.3.2.3 Particulate Matter - PM_{10} Results

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, as well as 24hr maximum PM_{10}, for the reporting period are shown in **Table 6-6.**

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. 24 hour maximum results for the reporting period and graphical representation of the 24 hour and annual average PM_{10} results are provided in **Figure 6-4**, **Table 6-6** and **Table 6-7**.

The annual average PM_{10} result for the 2019-20 reporting period as recorded by the TEOM was 22.4µg/m^3, substantially higher than the previous reporting period average of 13.4µg/m^3, but well below the PM_{10} Annual Average Criterion of 30 µg/m^3.

Total Suspended Particulates and PM_{10} results for HVAS units were also below the annual average criteria at all monitoring locations.

All monitoring sites exceeded the 24-hour short term impact assessment criteria during the reporting period. 2019 was Australia's driest and warmest year on record (BoM Annual Climate Statement 2019). Drought conditions were experienced from July 2019 through to January 2020, followed by significant rainfall in February 2020 which eased the dry conditions. These drought conditions along with major bushfires in the local area from November to January contributed to elevated dust results being recorded. All exceedances of air quality criteria were investigated and reported to DPIE. Exceedance investigations are further discussed in **section 6.3.2.4.**

Annual Average PM_{10} results are higher than the previous reporting period for all monitoring locations, as shown in **Table 6-7**. This is attributable to sustained drought conditions over the past three years, and local bushfires during the reporting period rather than Austar's operations. All results remain below the PM_{10} Annual Average Criterion of 30 µg/m^3.

TABLE 6-6 AIR QUALITY CRITERIA FOR PARTICULATE MATTER

Description	Pollutant	Averaging Period	Monitor	Criterion (µg/m^3)	Result 2018-19 (µg/m3)	Result 2019-20 (µg/m^3)
Long Term Impact Assessment Criteria for Particulate Matter	Total Suspended Particulate (TSP) matter	Annual Average	TEOM	90	33.4	56
			HVAS1		42.8	62.8
			HVAS2		47.7	62.0
			HVAS3		39	53.8
	Particulate Matter <10µm (PM_{10})	Annual Average	TEOM	30	13.4	22.4
			HVAS1		17.1	25.1
			HVAS2		19.1	24.8
			HVAS3		15.6	21.5
Short Term Impact Assessment Criterion for Particulate Matter	Particulate Matter <10µm (PM_{10})	24-hour Maximum	TEOM	50	132	193.5
			HVAS1		56	235
			HVAS2		57	237
			HVAS3		55	217

Note: *Methods for sampling and analysis of ambient air as defined by Standards Australia, AS 3580.9.6 -2003: Determination of suspended particulate matter—PM_{10} high volume sampler with size selective inlet—Gravimetric method.*

TABLE 6-7 PM_{10} HVAS AND TEOM ANNUAL AVERAGES FOR CURRENT AND PREVIOUS YEARS

ID	Location	Annual Average PM_{10} (µg/m^3)					
		EA Prediction	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
TEOM	Bimbadeen Road, Mount View	n/a	9.5	10.1	11.4	13.4	22.4
HVAS1	Pyne Way, Mount View	n/a	11.0	11.2	12.8	17.1	25.1
HVAS2	Ellalong Road, Pelton Village	n/a	12.5	12.0	15.8	19.1	24.8
HVAS3	Coney Creek Lane, Quorrobolong	42.07	9.6	9.8	11.8	15.6	21.5

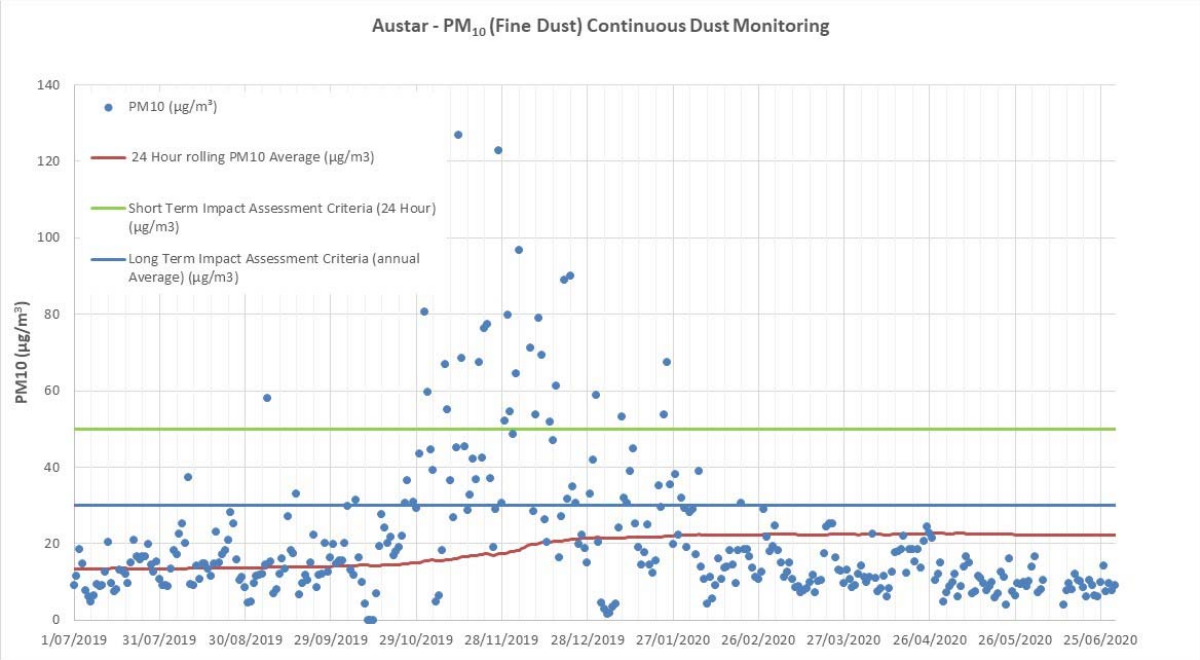


FIGURE 6-4 AUSTAR TEOM PM_{10} CONTINUOUS DUST MONITORING 2019-2020

6.3.2.4 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 specified in those approvals.

From September 2019 through to January 2020, the TEOM and HVAS's recorded results exceeding the air quality impact assessment criteria. These results were investigated and an assessment of Austar's contribution to particulate loads was undertaken. In no instances was it found that Austar was a major contributor to the high particulate matter results.

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

Table 6-8 details the particulate matter results that exceeded the short-term impact assessment criteria, with particulate matter data from the Austar TEOM, and wind speed and direction data from the on-site weather station at the CHPP.

All exceedances of impact assessment criteria, along with the assessment of contribution, were notified to DPIE. No further actions were required in relation to any of the elevated results.

TABLE 6-8 ELEVATED PARTICULATE MATTER INVESTIGATIONS

Date	Result (µg/m^3)	Annual Average (µg/m^3)	Average Wind Speed (m/s)	Maximum Wind Speed (m/s)	Predominant Wind Direction
6/09/2019	58.0	13.9	1.4	18.3	WSW
26/10/2019	96.1	14.9	7.2	17.9	NNW
30/10/2019	107.4	15.4	0.3	5.4	ENE - N
31/10/2019	80.7	15.5	0.6	8	
1/11/2019	59.6	15.7	0.5	7.2	E - N
7/11/2019	67.0	15.7	1.2	12.5	WSW - NW
8/11/2019	55.0	15.8	1.7	14.3	N - NW followed by S
12/11/2019	126.8	16.4	1.4	12.5	NW then S
13/11/2019	68.4	16.6	0.7	8.5	S then W
19/11/2019	67.5	17.1	0.8	8.5	E, S, SW and N
21/11/2019	76.4	17.4	0.4	6.7	ENE - N
22/11/2019	77.3	17.4	1	8.9	E
26/11/2019	122.8	17.4	1.7	19.7	N-NW, then S
28/11/2019	52.2	17.5	0.5	8	E
29/11/2019	79.9	17.7	1.38	5.9	S-SW from midnight to midday, then N
30/11/2019	54.4	17.9	1.19	5	N-NW, with occasional southerly winds
2/12/2019	64.5		2.16	5.2	NW
3/12/2019	96.7		1.86	6.3	N-NW
4/12/2019	161.7		1.49	4.7	N-NW

Date	Result ($\mu g/m^3$)	Annual Average ($\mu g/m^3$)	Average Wind Speed (m/s)	Maximum Wind Speed (m/s)	Predominant Wind Direction
5/12/2019	160.9		1.42	5.6	SW - N
6/12/2019	193.5	18.9	1.34	6.3	SW - N
7/12/2019	71.3	19.1	1.21	5.7	S
9/12/2019	53.6	19.3	0.77	3.4	N
10/12/2019	78.9	19.5	1.53	6.2	S
11/12/2019	69.4	19.7	2.21	5.7	S
14/12/2019	51.9	19.9	1.02	3.5	S, W, N.
16/12/2019	61.2	20.2	1.78	4.9	S
19/12/2019	88.9	20.5	1.65	6.8	N, then late Southerly change
21/12/2019	90.1	20.8	2.17	8.7	N
30/12/2019	58.8	21.4	0.93	4	N
8/01/2020	53.3	21.5	1.56	4.6	S
23/01/2020	53.7	21.8	3.31	8.4	NW
24/01/2020	67.5	21.9		4	N-NW, with some southerly winds

6.3.2.5 Data Outages

There were two instances of lost data during the reporting period. These are discussed below and in **Table 11-1.**

From the 15 May to 9 June 2020, HVAS1 was not operational. This was due to a disconnected power supply as the landholder was conducting property improvement works and needed to isolate power. Other options to power the unit were investigated, but an immediate solution was not available. However, power was reinstated as soon as possible and HVAS1 was operating from 9 June 2020. DPIE were notified at the time and have since advised there would be no further action taken in relation to the incident.

The compact flash card in the TEOM failed on the 5 June 2020. A new card was sourced and installed and the unit calibrated on the 10 June 2020. DPIE was notified and have advised that no further action would be undertaken in relation to the incident.

Seven per cent of data was lost at HVAS1 for the reporting period, and 1.6 per cent lost at the TEOM as a result of these outages. These data losses did not materially affect the monitoring program. Periods of loss were short, other HVAS were in operation, and operations were minimal due to being in a care and maintenance phase.

The AQGHGMP states that the TEOM will operate continuously, and HVAS1 will operate every six (6) days. These periods of lost data do not comply with the AQGHGMP and have been listed in **Table 1-1** as an administrative non-compliance against PA 08_0111 and DA 29/95.

6.4 Biodiversity

6.4.1 Environmental Management

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 6-5**) was found to broadly align with the description of the *Threatened Species Conservation Act 1995* listed River-flat Eucalypt Forest Endangered Ecological Community (EEC).

The Stage 3 monitoring surveys are a continuation of baseline monitoring established in 2012 and are carried out in accordance with 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 6-6**).

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

Ecological Monitoring was undertaken in Spring (September 2019) and Autumn (March 2020).

Stage 3 Mining Area

Mining last occurred in the Stage 3 Area in June 2015. No recommendations were made for the Stage 3 monitoring sites, as no observable impacts as a result of longwall mining were recorded.

Floristic diversity in 2019 experienced an overall decrease from the 2018 monitoring events, which is correlated to ongoing drought conditions. During the Autumn monitoring, no changes were observed and the vegetation at all sites was considered stable and free from mining impact.

The last five years of monitoring have shown no impact to the vegetation over the mined longwalls, and gathered adequate baseline data for a return to mining in the Stage 3 area.

Bellbird South Mining Area

The ongoing drought conditions prior to monitoring in September 2019 resulted in lower floristic diversity, due mainly to a reduction in seed emergence, as well as plant desiccation and wilting making it difficult to identify plant species. Mild canopy species dieback was identified during the 2019 monitoring, however this is more likely to be attributable to drought conditions than longwall mining, as it is occurring on mined and unmined lands.

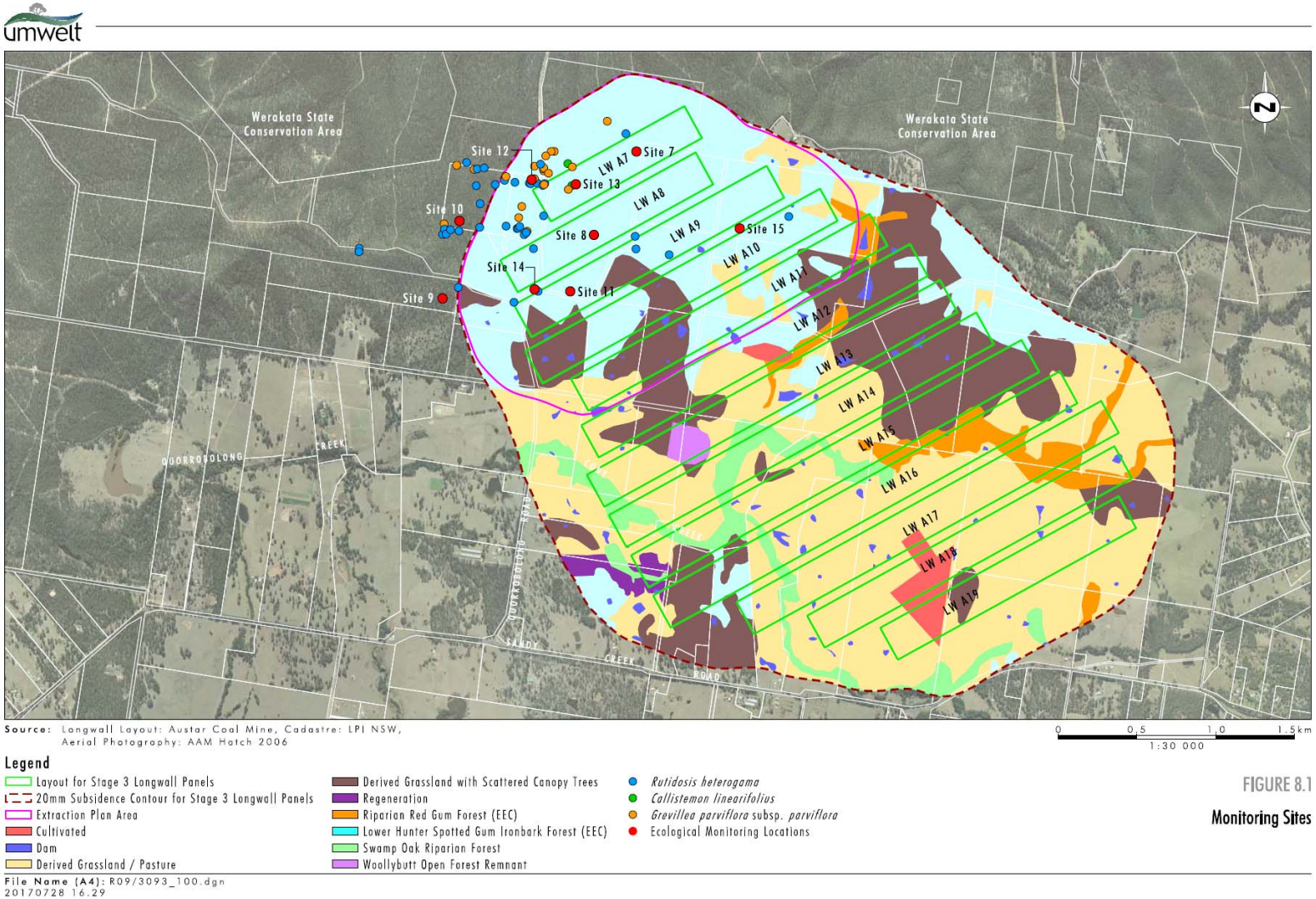


FIGURE 6-5 LOCATION OF STAGE 3 ECOLOGICAL MONITORING SITES

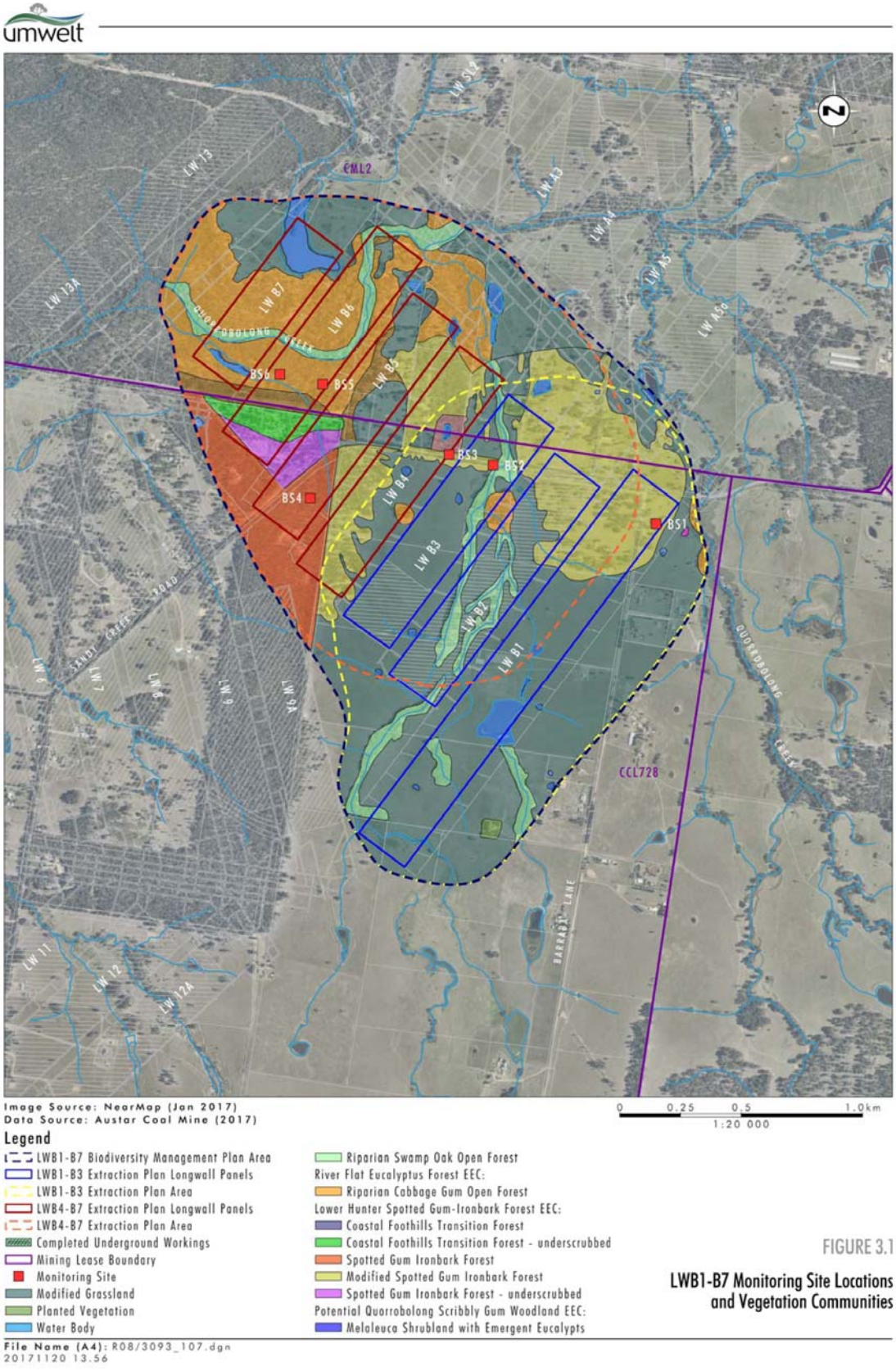


FIGURE 6-6 LOCATION OF LWB1-B7 ECOLOGICAL MONITORING SITES

6.5 Vibration and Blasting

6.5.1 Environmental Management

Austar implements a Noise and Vibration Management Plan (NVMP) prepared in accordance with the requirements of PA08_0111 and DA 29/95. This plan was updated in June 2018 and approved by DPE 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 no vibration events were recorded at V7 during the reporting period.

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. 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).

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 6-7** and **Figure 6-8**.

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 64 vibration events recorded in the 2019-20 reporting period (PVS >1mm/s), which is generally similar to past reporting periods at full production (eg. 2016-17 had 85 vibration events recorded). This is more than the previous two reporting periods, with 25 vibration events recorded in 2018–19 (lower result due to longwall miner not operational for four months of the reporting period), and 21 vibration events in the 2017-18 reporting period (which also had periods the longwall miner was not operational).

The maximum recorded event for the current reporting period was 13.46mm/s, less than the British Standard guide of 15mm/s for minimal risk of cosmetic damage.

There were no day time vibration events that exceeded the day time maximum criteria of 17mm/s from the DECC Guideline, with three events exceeding the preferred daytime criteria of 8.6mm/s. Seven (7) night time vibration events exceeded the preferred night time criteria, one of which also exceeded the night time maximum criteria of 5.6mm/s with a recorded result of 8.18mm/s.

It is important to note that the vibration criteria are non-mandatory (DECC 2006) so are used as a comparison monitoring tool to assess possible annoyance. Due to the vibration being strata generated, the timing of vibration events cannot be controlled, as would be the case in say, pile driving, so operational controls are not feasible in this case.

No vibration-related complaints were made during the reporting period.

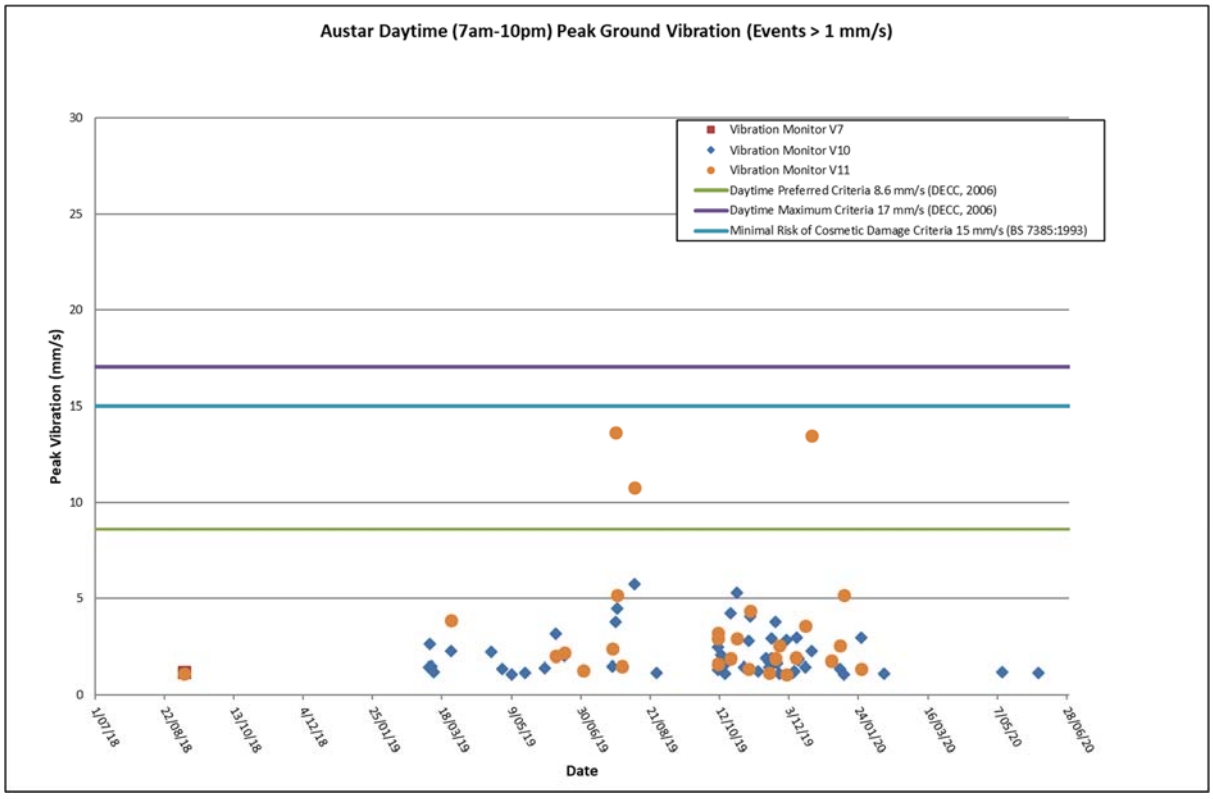


FIGURE 6-7 DAY TIME GROUND VIBRATION EVENTS

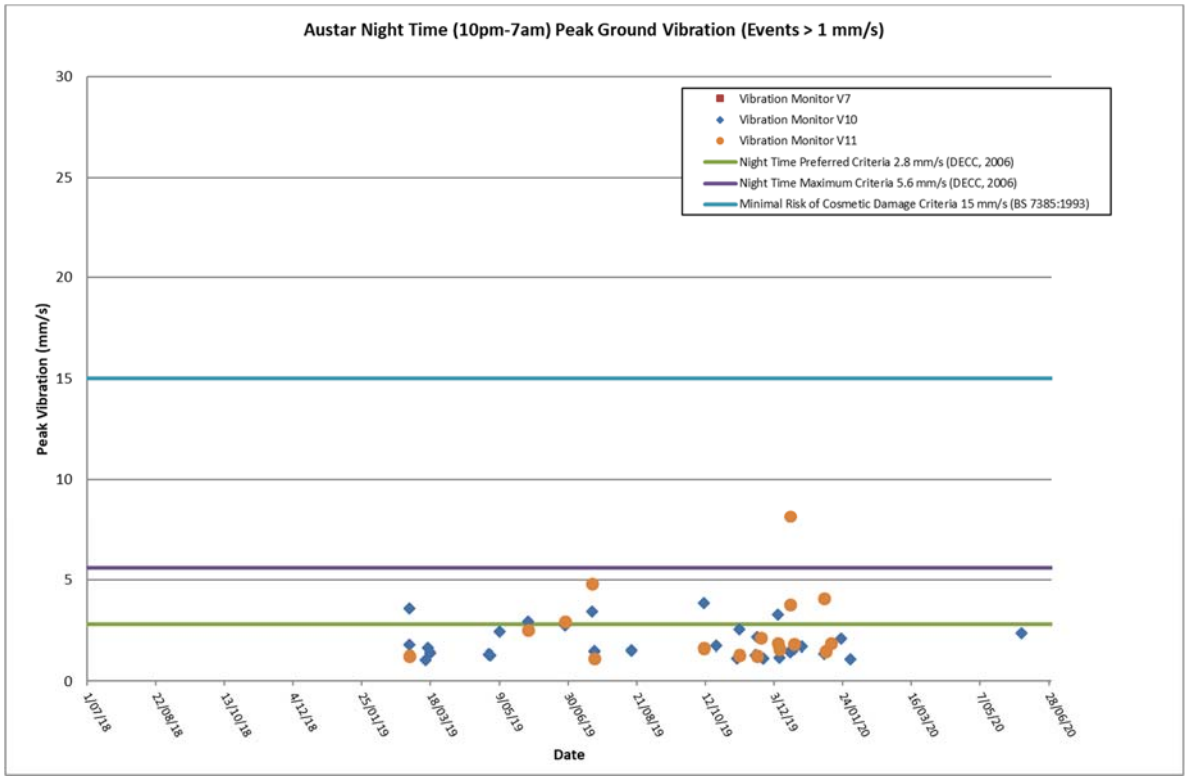


FIGURE 6-8 NIGHT TIME GROUND VIBRATION EVENTS

6.6 Noise

6.6.1 Environmental Management

Austar implements a Noise and Vibration Management Plan (NVMP) prepared in accordance with PA08_0111, DA 29/95 and EPL 416. This plan was 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 6-9** and presented in **Plan 2**.

TABLE 6-9 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 2019-20 reporting period is provided in **Table 6-10, Table 6-11** and **Table 6-12**. All monitoring results were within compliance criteria during the reporting period.

Austar complied with relevant noise limits during the 2019-20 reporting period.

Since the transition to care and maintenance, the noise monitoring program has continued unchanged and in accordance with the NVMP and EPL Noise PRP requirements.

Noise sources have reduced, with the mine coal conveyor system including coal bins not operational. The CHPP raw and clean coal systems, trains and loading infrastructure, stockpile dozers and reject trucks are also not operational. The reverse osmosis water treatment plant and mine ventilation fans continue to operate 24 hours per day 7 days per week.

CHPP Noise Pollution Reduction Program

Austar has been undertaking a voluntary noise PRP in consultation with the EPA for many years. During the reporting period, further sound power testing was undertaken on-site at the CHPP, following recommendations of the sound power review. A noise control options analysis was completed and the CHPP noise model updated. Austar transitioned to a care and maintenance phase before the model could be validated. As such it is recommended any further evaluation of noise control be postponed until further significant noise generating operations resume. Austar has written to the EPA requesting the evaluation be postponed.

TABLE 6-10 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 2019	Night	38	43	31
		NM	<35	IA
		33	IA	<30
Q4 2019	Night	38	36	30
		26	26	NM
		37	37	31
Q1 2020	Night	37	38	29
		25	<25	<20
		<20	<28	<20
Q2 2020	Night	IA	IA	IA
		IA	IA	IA
		IA	IA	NM

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 6-11 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 2019	Night	33	<30	IA	42	<30	IA
		IA	NM	NM	IA	NM	NM
		<25	IA	IA	<25	IA	IA
Q4 2019	Night	IA	IA	IA	IA	IA	IA
		<25	IA	IA	30	IA	IA
		IA	IA	IA	IA	IA	IA
Q1 2020	Night	IA	IA	IA	IA	IA	IA
		<20	IA	IA	<20	IA	IA
		<20	IA	IA	<20	IA	IA
Q2 2020	Night	<30	<25	NM	<30	<25	NM
		IA	IA	<05	IA	IA	<20
		30	IA	<25	32	IA	<25

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 KALINGO INFRASTRUCTURE AREA AGAINST SPECIFIC PROJECT CRITERIA, SITE K4

Quarter	Period	Austar KIA Only $L_{Aeq, 15\ min}$ (dB)
		Noise Criteria 35
Q3 2019	Night	34
		NM
		25
Q4 2019	Night	NM
		<20
		NM
Q1 2020	Night	NM
		<20
		29
Q2 2020	Night	<30
		<25
		<25

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.

6.7 Heritage

6.7.1 Environmental Management

Austar implements an Aboriginal Cultural Heritage Management Plan (ACHMP). This plan was 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 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.

The Austar CHPP property is heritage listed, and contains heritage items in varying states of repair, including the old store and stable building, office blocks and boiler tanks. The need for and timing of historic heritage assessments has been identified as part of the closure planning process in the MOP Amendment A submitted to Resources Regulator on 1 July 2020 for approval.

6.7.2 Environmental Performance

During the reporting period, Austar undertook field work to conduct a Hazard Reduction Burn on mine owned lands near Pelton in accordance with 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.

Five stone artefact sites were identified and recorded during the site inspection. The archaeological due diligence assessment report states that the Aboriginal representative recommended that since materials were identified on the sandy track exposures, that those sections of track be barricaded / demarcated to prevent further disturbance. The Aboriginal representative also indicated that 'burning would have a negative impact on stone artefacts… and disturbance to the sites should be minimised as much as possible'.

The archaeological due diligence assessment report indicated that there is a low risk the proposed hazard reduction burn will result in harm to Aboriginal objects, but recommends that sites close to access tracks be clearly demarcated to ensure no damage from vehicles.

A locally listed heritage item, being the 'Maitland Railway System' (Item I212) is also located within the hazard reduction burn area, along the southern edge. This item is listed in Schedule 5 of the Cessnock Local Environmental Plan (2011) and is present within the hazard reduction burn area as a culvert and rail line remnants (including track, brick/stonework and wooden sleepers).

Based on the nature of the works proposed, being low intensity burning, and the rail embankment running along the southern edge of the proposed hazard reduction burn area, no adverse impacts to the elements of this item are anticipated due to the material types of the feature and the disturbed nature of the surrounding landscape, resulting in less fuel load material near the feature.

The hazard reduction burn is planned to occur in 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 (initially approved 25 August 2017, and revised and approved 12 February 2019). Other approved Extraction Plans are listed in **Section 3.3.1**.

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. Survey of the cross line is conducted pre-mining, at completion of longwall and then 6 monthly post mining until subsidence substantially complete. 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'* are 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 environmental or built features within the Extraction Plan areas.

6.8.2 Environmental Performance

During the reporting period, Austar continued to extract coal in Longwall LWB5 until 21 August 2019. Extraction in LWB6 commenced on 27 September 2019 and was completed on 12 February 2020.

Subsidence monitoring has been undertaken in accordance with the Subsidence Monitoring Program and subject to landholder access. The mine subsidence movements resulting from the extraction of Longwall LWB5-LWB6 were monitored during the 2019-20 reporting period using Line SCR1 (Sandy Creek Road) and the cross line. The location of these monitoring lines for the Bellbird South area is shown on Figure 6-9**Figure 6-9.**

Subsidence monitoring results from the Bellbird South area have been consistently within the maximum predicted range along Line SCR1 as shown in the **Table 6-13**. All measured total vertical subsidence readings were lower than predictions.

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 6-13**.

TABLE 6-13 MAXIMUM PREDICTED AND MEASURED TOTAL VERTICAL SUBSIDENCE AND TILT FOR SANDY CREEK ROAD (LINE SCR1) TO END OF LWB6

Location	Longwall	Maximum Predicted Total Vertical Subsidence (mm)	Maximum Measured Vertical Subsidence (mm)	Maximum Predicted Total Tilt (mm/m)	Maximum Measured Incremental Tilt (mm/m)
SCR1	LWB1-LWB3	850	508	5	2.2
	LWB4	1,200	453	5.5	1.3
	LWB5	1,250	565	5.5	2.4
	LWB6	1,300	792	5.5	3.7

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 2.1mm/m for compressive strain and 2.0mm/m for tensile strain during the reporting period. These results are close to 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, LWB4, LWB5 and LWB6 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 review.

No subsidence management actions were required to be undertaken during this reporting period.

Final subsidence surveys will be conducted for Longwalls LWB2-LWB6 one year after completion of mining (nominally February 2021) and will be reported in the next Annual Review.

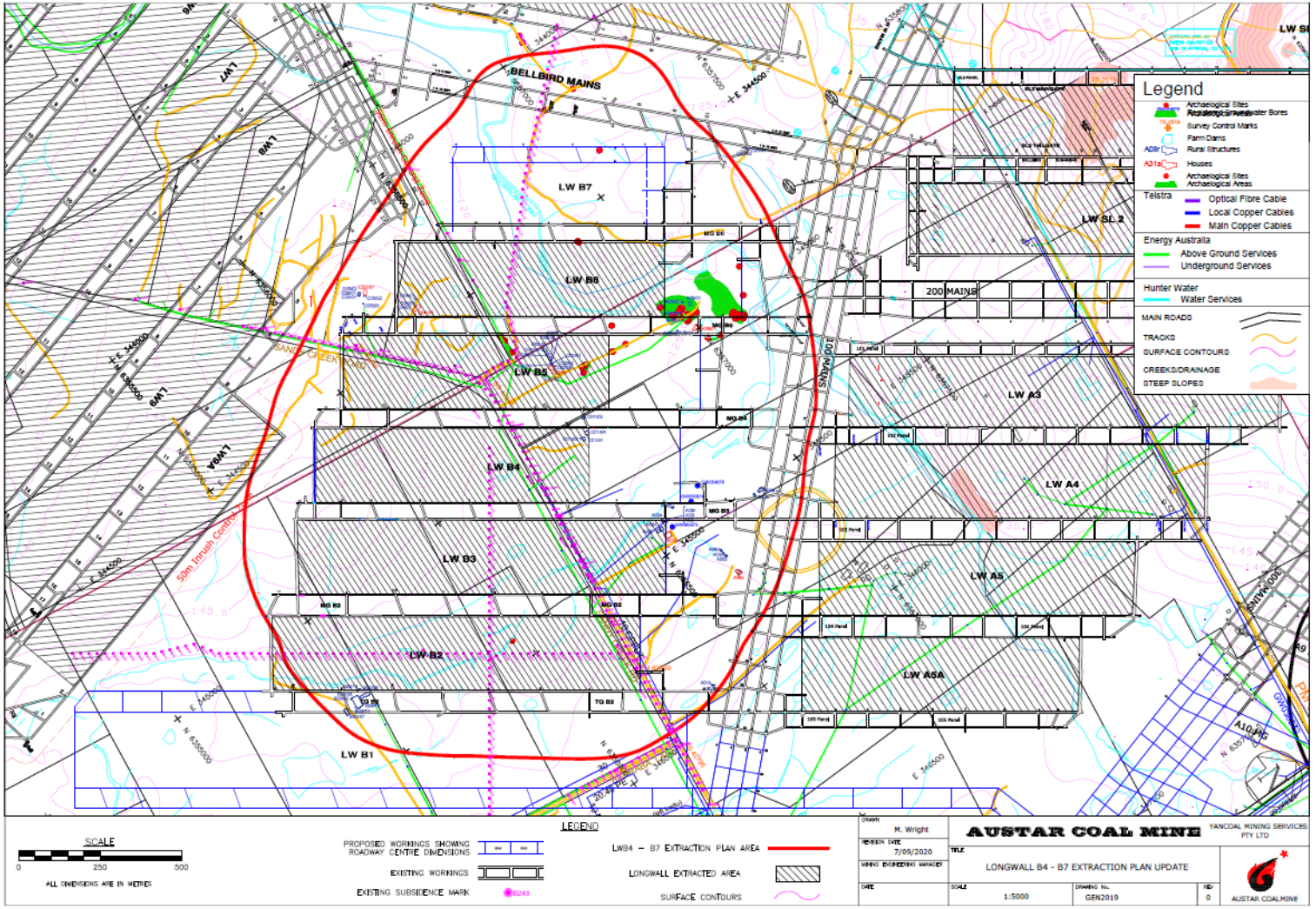


FIGURE 6-9 SUBSIDENCE MONITORING SURVEY PLAN BELLBIRD SOUTH AREA

6.9 Weed Management

6.9.1 Environmental Management

Weed control has been addressed on an as-needs basis in past years. With diverse and extensive landholdings, it has been recognised that weed management should be conducted in a systematic manner. During the reporting period, Austar worked with land management consultants to develop a Weed Action Plan, to guide the management of weeds over the coming years.

Due to the large areas owned by Austar Coal Mine, focus locations were selected for future maintenance. These locations were typically in areas previously disturbed by site works, rehabilitation areas, known problematic areas, or naturally formed areas such as creek lines that are prone to exotic weed infestations. It was noted during the inspections that large undisturbed areas outside of the designated focus points were typically clear of exotic weed infestations and maintained healthy unobstructed native growth.

The Weed Action Plan identifies environmental weeds found on site, and outlines locations, area covered, a summary of the weed characteristics, recommended actions and optimum season for treatment.

6.9.2 Environmental Performance

During the reporting period, approximately 15 hectares of weeds were treated include *Acacia saligna*, Green Cestrum (*Cestrum parquai*), Lantana (*Lantana sp*), Mother of Millions (C*hrysanthemoides Monilifera*), Mother of Thousands (*Bryophyllum daigremontianum*) and Tobacco Bush (*Solanum Mauritianum*). Weed treatment was prioritised to address areas where weeds may spread offsite – including boundary fences and waterways, and rehabilitation areas where weeds could can compromise rehabilitation outcomes.

The Weed Action Plan will continue to be implemented over the coming years, and progress will be reported in Annual Reviews.

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 to Bellbird Creek in accordance with EPL 416. There are a number of underground water storage areas, as outlined in the SWMP.

The surface water storage and management system is used to ensure the underground workings can be dewatered as required to allow for continual access to all necessary parts of the underground operation, as well as manage surface water runoff during rain events. Further information on site water management can be found in the approved SWMP.

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
Bore Licence Certificate	20BL173878	8 Dec 2014 - Perpetuity	Monitoring Bore (MB01)	N/A

Licence Held	Licence Number	Validity of Licence	Purpose of Licence	Extraction Limit
Bore Licence Certificate	20BL173891	19 Mar 2015 - Perpetuity	Monitoring Bore (MB02)	N/A
Water Access Licence	WAL19181 / 20AL210298	Continuing	Unregulated River Water Licence	Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone. 10 shares
Water Access Licence	WAL41504 / 20AL217003	Continuing	Aquifer - Industrial dewatering 16CT pump station No 2 Shaft No 2 Shaft Borehole	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

7.2 Water Take

TABLE 7-2 WATER TAKE 2019-20

Water Licence #	Water sharing plan, source and management zone (as applicable)	Entitlement	Passive take / inflows (ML)	Active pumping (ML)	TOTAL (ML)
WAL19181 *	Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone.	10 shares	0	0	0
WAL41504	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	658.5	0	658.5

** 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 revised in June 2018 was approved by the DPE 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).

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 EC Fe TDS TSS Volume	6.5-8.5 N/A 1 mg/L 6,000 mg/L 50 mg/L 2,000 KL/day
	• **SW2** – Bellbird Creek Pinch Bridge, **EPL Point 2** • **SW4** – Bellbird Creek Eastern Boundary Downstream of CHPP, **EPL Point 4** • **SW5** – Unnamed Creek Western Boundary Upstream of CHPP, **EPL Point 5**	EC pH Fe TSS	N/A N/A N/A N/A
	• **SW6** – 1ML tank discharge to Bellbird Creek, **EPL Point 6**	EC pH Fe TSS Volume	600 µS/cm 6.5-8.5 1 mg/L 50 mg/L 5,000 KL/day as annual average
Creeks – Underground Mining Areas	• **SWQ1** – Quorrobolong Creek (Sandy Creek Road) • **SWQ2** – Quorrobolong Creek (Austar Owned land) • **SWQ3** – Quorrobolong Creek (Austar Owned Land) • **SWC1** – Cony Creek (Quorrobolong Rd)	EC pH Fe TSS	N/A N/A N/A 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 523ML was discharged from the Reverse Osmosis water treatment plant, via the 1ML tank to SW6 over the reporting period. This was an average of 1.4 ML/day. The Reverse Osmosis plant did not operate during late October, November and for much of December. During this time the pumps that dewater the mine at No.2 shaft were undergoing maintenance and not operational. Water was unable to be pumped from underground in the required volumes to efficiently operate the Reverse Osmosis plant. There was minimal discharge to Bellbird Creek in October and December, and no discharge from the Reverse Osmosis plant to Bellbird Creek during November.

At SW6, water quality results for all tested parameters (pH, EC, TSS and Fe) were within EPL limits.

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

- pH measured at individual sites remained relatively constant ranging between pH 5.61 (SW2) to pH 7.78 (SW5), which was similar to the 2019-20 range of pH 6.13 to ph7.52 and the 2017-18 range of pH 6.26 to pH 7.78;

- EC ranged between 179µS/cm (SW2) and 748µS/cm (SW5), which was similar to most results in the 2018-2019 range of 154µS/cm (SW2) to 673µS/cm (SW5) and 2017-18 range of 154µS/cm (SW2) to 9870µS/cm (SW5), except for some outlying results at SW5 in the 2017-2018 reporting period;

- TSS ranged between <5mg/L at all sites to 16mg/L (SW5) for the reporting period, which was similar to the 2018-2019 range of <5 – 18mg/L and lower than the 2017-18 range of <5mg/L (SW2, SW4) to 114mg/L (SW5) (likely due to low flows); and

- Fe (Iron) recorded a minimum of <0.05mg/L at SW2 and SW4 and a maximum of 2.2mg/L at SW2, which is comparable to the 2018-2019 range of <0.05mg/L - 3.03mg/L and lower than the range in the 2017-18 reporting period (8.82mg/L at SW5).

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

Bellbird Creek is ephemeral at sampling location SW5 upstream boundary to CHPP. Historically, water sampling at SW5 has been somewhat influenced by a potable water leak in the Hunter Water reservoir just upstream of the sample location, which may have also influenced the pH results at this location. Following repair of the reservoir leak in October 2019, this monitoring location was dry for the remainder of the reporting year.

SW2 was dry during December 2019 and SW4 was dry during November and December 2019. Both locations were affected by the Reverse Osmosis plant not being operational at the time of monitoring and not discharging to Bellbird Creek.

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 have been interpreted.

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

- Quorrobolong Creek was generally dry throughout the reporting period, with 3 samples taken at SWQ1, five samples at SWQ2, and two samples taken at SWQ3. The sampling location on Coney Creek is in a deep pool, with samples taken every month during the reporting period. Results vary throughout the reporting period, which is to be expected given the lack of rainfall to flush the pool.

- pH ranged between pH 5.45 and pH 7.5, within the range monitored in the last two years (pH 3.78 - 7.99 in 2018-2019 and pH 6.99 - 8.2 in 2017-2018).

- EC results ranged between 342µS/cm and 3350µS/cm during the reporting period, with similar high results to previous years. The low EC recorded during this reporting period may be due to rainfall flushing the creek after sustained drought conditions. Ranges for the past two reporting periods are 1,120µS/cm to 3,710µS/cm, and 1,560 µS/cm to 2,640 µS/cm.

- TSS ranged from 6 to 73mg/L, a greater range than previous reporting periods, which can be attributed to both drought conditions and significant flows being experienced during this reporting period. Ranges over the past two reporting periods are 11mg/L to 33mg/L, and <5 - 77mg/L.

- Fe (Iron) results range from 0.98mg/L to 16mg/L during the reporting period. This is comparable to the last 2 reporting periods, which ranged from 0.6mg/L to 13.9mg/L in 2018-2019 and 0.6 to 6.19mg/L in 2017-2018.

7.3.3 CHPP Investigation Drainage Line

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 relevant regulators. Monitoring has continued during the reporting period in accordance with conditions U3 and E2 of EPL 416. These conditions were added on 15 December 2017 as part of a PRP 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 Resources Regulator 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 mine water system. Additionally, water below the Investigation Drainage Line can be captured within Doyle Street Dam and pumped back to the mine water system if required.

During the reporting period, no orange staining or salt staining was observed in the clean water drainage line. Monitoring will continue in the following reporting period.

7.3.4 Kitchener Sediment Dam Discharge - February 2020

The Kitchener Surface Infrastructure Site (SIS) contains established infrastructure including an upcast and downcast ventilation fan, services borehole/drophole, pipelines, powerlines and electrical substation, as well as vegetated stockpiles that will be used for the rehabilitation of the site. There are several sedimentation dams on the site designed to catch sediment laden runoff from disturbed areas. The majority of disturbed areas have now been revegetated.

As outlined in the SWMP, the sediment dams are designed to catch runoff for up to the 90th percentile 5-day rainfall events. Any rainfall event of greater intensity will cause the dams to overflow, with runoff reporting to Black Creek headwaters.

A total of 113.8mm of rainfall was received at Kitchener SIS from 9:20am 6 February 2020 to 7:35pm 9 February 2020 causing the sediment dams to discharge water from site. Rainfall received was well above the 42.8mm 5-day design size of the sediment dams.

Austar enacted the Pollution Incident Response Management Plan (PIRMP) and reported the event to relevant authorities on the basis there was potential to cause pollution of waters through sediment discharge. Water samples were collected for laboratory analysis during the discharge event. Discharge flow rates were observed to be low, with water moving slowly and overland discharge flow shallow. Based on the review of water sampling results, there was unlikely to be any material harm caused by the incident.

A written incident report was submitted to the EPA, DPIE and Resources Regulator on 17 February 2020. The Resources Regulator inspected the site on 25 February 2020. All agencies have advised no further action would be taken at that time.

7.4 Ground Water

7.4.1 Environmental Management

The 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 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 first half of the reporting period, consistent with dry conditions. NER1010 and the alluvial monitoring bores, showed recharge from February onwards in response to rainfall events. MB02 has been gradually recharging since remediation works in November 2019 and is discussed further below.

- Groundwater pH remained relatively stable during the reporting period when compared to the previous reporting period, with the exception of MB02 and NER1010, which both experienced drops of pH. The sudden change of pH in NER1010 was suspected to have been due to stratification within the bore. This was remediated through air lift development of the bore in November 2019. NER1010 pH reduced after airlift development and has gradually increased over the past three monitoring quarters towards that of historic results. MB02 pH results have stabilised since air lift development, indicating less stagnant water in the bore profile.

- Electrical conductivity results ranged from relatively consistent at some of the alluvial bores, to relatively variable at others. Some of the more variable alluvial bores were MB03A (which ranged from 12,500µs/cm to approximately 15,000µs/cm) and MB04 (which ranged from approximately 6,250µs/cm to almost 11,250µs/cm). EC results in MB02 increased in

December 2019 and March 2020, before stabilising during the last quarter. This is thought to be due to differing recharge sources, as the water level recovered 42 metres during one quarter following airlift development. It is likely that MB02 is screened over multiple lithologies.

- In the last quarter of 2019, field and laboratory results displayed a notable difference in water chemistry (EC) between water level and bore screen samples within NER1010, MB04 and WBH3. To address potential stratification within NER1010 this bore was airlift developed. Future groundwater quality results from monitoring bores MB04 and WBH3 are being monitored to determine whether these bores are also becoming stratified.

MB02 and NER1010 are further discussed below. No obvious mining impacts have been identified in relation to level, pH and EC results.

There are no new trends in groundwater quality or water levels that indicate impact conditions that require enactment of the SWMP Response Plan triggers. Monitoring indicates that mining impacts are within EA predictions, and there is no evidence of impacts outside of established predictions.

7.4.2.1 Maintenance Works

Maintenance works were undertaken at three groundwater monitoring bores MB01, MB02 and NER1010 during late October and early November 2019. Downhole camera surveys followed by airlift development was undertaken within monitoring bores MB02 and NER1010 to attempt to rectify groundwater stratification that had been identified. A pressure transducer and sampling sleeves were retrieved from MB03.

Downhole camera surveys were undertaken to confirm previously recorded construction details and assess the structural integrity of the monitoring bores.

Airlift development is designed to restore or improve the hydraulic characteristics of monitoring bores. This process was recommended due to the ongoing differing water quality between standing water level and bore screen samples. Compressed air is surged into the bore at screen depth to assist in sediment displacement and removal, and increase groundwater flow into the screen.

Monitoring Bore NER1010 showed the greatest response to rainfall of all the bores in Austar's monitoring program. The lack of concrete headworks was identified as potentially allowing surface water to infiltrate the bore, leading to inaccurate groundwater level data and contributing to stratification of the bore. A cement headworks was installed on 31 October 2019.

In monitoring bore MB01, the pressure transducer and sampling sleeves were detached from the wellhead post Q2 sampling and needed to be extracted from the bore. A downhole camera survey was undertaken with subsequent equipment retrieval.

Following the remediation works in November 2019, each bore had a different response:

- NER1010 groundwater level recovered quickly, and responded with gradual increases after the above average rainfalls in February. NER1010 is a sandstone aquifer bore approximately 100m depth. pH has slowly increased since airlift development, which may be due in part to rainfall and recharge, as well as a cleaner screen allowing throughflow of groundwater. Sudden water quality change in response to rainfall events has not occurred since the headworks upgrade.
- MB02 is still slowly recovering and has not reached a constant standing water level after airlift development. MB02 is a very deep bore approximately 140m depth. pH decreased following maintenance works and has remained relatively stable since.
- In June 2020, groundwater elevation in MB01 declined 0.22m since the December 2019 measurement. Groundwater elevation data for MB01 in Q1 2020 was erroneous due to a further obstruction within the bore casing causing leading to an inaccurate field measurement. The obstruction was removed 20 June 2020.

These bores will continue to be monitored in the next reporting period. The bore network is currently considered effective with no further maintenance recommended. Recommendations will continue to be addressed as required in future reporting periods.

7.4.2.2 Historical Groundwater Review and Assessment – Additional Monitoring 2019

During 2018, 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 2019 monitoring program included:

- 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).
- Laboratory testing of basic parameters EC, pH, TDS, along with major ions.

The monitoring program was undertaken during calendar year 2019 and the peer reviewed results submitted to DPE and reviewed by NRAR. The recommendations arising out of the review are as follows:

- Upon recommencement of mining operations, review the groundwater monitoring program and consider the need for new bores screened to capture individual aquifers;
- Cease sampling of the top of the water column (the pre-purging sampling) as it is not representative;
- Continue quarterly sampling and field analysis for basic parameters only; and
- Move to annual laboratory analysis of basic parameters and major ions.

The monitoring recommendations have been adopted for the 2020 groundwater monitoring program.

8 REHABILITATION

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

MOP Amendment A was prepared in June 2020 to reflect the change in operations to a care and maintenance phase and lodged with Resources Regulator for approval on 1 July 2020. New commitments in MOP Amendment A include progressing a mine closure planning strategy for the Austar Coal Mine.

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 Rehabilitation of Disturbed Land

During the reporting period, rehabilitation of available (final height) reject emplacement areas was undertaken, along with rehabilitation maintenance recommended in the 2019 Rehabilitation Monitoring report.

Consistent with the submitted MOP Amendment A, there are no rehabilitation activities planned for the next reporting period. Infrastructure areas remain in the active phase for future use on resumption of operations. All areas within reject emplacements that have reached final design height have been capped and rehabilitated, with the remaining void spaces required for future operations. Subsidence remediation may 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.

8.1.1 Aberdare Reject Emplacement Area

During the reporting period, capping activities were undertaken at the Aberdare Reject Emplacement Area, as shown in **Plan 3B**. A total of 0.73ha was capped and compacted to 1 metre depth using suitable material from the overburden stockpile adjacent to West Pit. 2019-20 capping works followed on from the 0.93ha capped in the previous reporting period.

Potential capping material was identified and permeability testing undertaken to ensure the material would be effective at reducing seepage and maintaining compaction over the reject emplacement area. Capping material was spread in 300mm lifts, and compacted with a roller prior to the next layer of capping being applied. Compaction testing was then undertaken on each layer to make sure the material formed an adequate barrier.

A sandy overburden material was used as a growth medium and spread at a nominal 100mm thickness over the areas capped from 2018 – 2020, a total of 1.66ha. Soil testing was undertaken and organic

matter and fertiliser requirements recommended by Sydney Environmental Soil Laboratories. Organic matter and fertilisers were applied as recommended for this area, and the pasture seed mix (detailed in the MOP) was spread.

Due to the very dry conditions over Spring and Summer, spreading the organic matter and seeding was delayed until June 2020. Light rains and a warm start to winter were ideal conditions for seed germination, and initial growth results in this area are promising.

8.1.2 West Pit

Capping used at the Aberdare Reject Emplacement Area was sourced from the West Pit stockpile. The disturbance footprint of the stockpile area is 0.98ha. As the stockpile was removed the area was shaped and graded, soil samples were taken, and recommended organic matter and fertiliser were added prior to seeding in June 2020.

As for the Aberdare Reject Emplacement Area, initial growth results in this area are promising.

8.1.3 Underground Mining Area (Extraction Plan)

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

8.1.4 Exploration

There were no surface exploration works undertaken during this reporting period. All previous exploration boreholes have been rehabilitated.

During the reporting period, four exploration drill holes were signed off as completed by the Resources Regulator. All required reports and monitoring data will be compiled to allow the sign-off of other completed exploration drill holes in the next reporting period. Future exploration works are detailed in **Section 4.1**.

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.

A rehabilitation monitoring program is undertaken annually, with results compared to the completion criteria in the MOP and recommendations provided to progress towards the completion criteria.

Consistent with previous years, 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**) and the trigger action response plan (TARP) (**Table 8-2**) from the approved MOP.

Recommendations arising from the 2020 annual rehabilitation monitoring report are discussed below, along with proposed actions to address the recommendations:

- Weed management – weed infestations require management and control in all rehabilitation areas. Weeds identified include Camphor Laurel, Lantana, Green Cestrum and Prickly Pear. A Weed Action Plan was developed for the site incorporating the rehabilitation areas and is to implemented over a number of years.
- Supplementary planting – areas of bare earth were identified during rehabilitation monitoring at Area 12 and Aberdare Emplacement Area. Maintenance activities to repair the bare earth areas at Aberdare Emplacement Area were completed in June 2020.
- Prevention of unauthorised access – Evidence of unauthorised access (such as rubbish dumping, 4WD tracks, motorbike tracks and burnt-out vehicles) were identified across each of these REAs. Given proximity to urban areas, such aspects will be difficult to control. However, unauthorised access raises a significant threat to rehabilitated areas, primarily in terms of physical damage to establishing vegetation, fire outbreak (from unauthorised burning practices), and potential for introduction and spread of weeds. Preventing unauthorised access is an ongoing challenge at Austar Coal Mine, with security patrols, ongoing fencing repair and improvement, and placement of barriers in access areas. This will continue during the next reporting period.
- Rubbish removal – dumped cars and rubbish are evident in rehabilitation areas. Rubbish and burnt out cars are removed periodically from rehabilitation areas and across the site generally. This will continue in future reporting periods.

TABLE 8-1 MOP PERFORMANCE CRITERIA ASSESSMENT

	Area 12	Area 13	Aberdare REA
All Phases			
Minor rilling only (less than 30 cm by 30 cm), within areas that landform works have been undertaken	✓	✓	✓
Ecosystem and Land-Use Establishment Phase			
Pasture			
Ground cover comparable to pre-mining environment is re-established following remediation activities	✓	✓	✓
Remediation areas revegetated with species selected based on the existing land use (i.e. pasture) and surrounding vegetation	•	•	•
Ecosystem function is rehabilitated to that existing pre-mining and consistent with the surrounding landform	✓	✓	✓
Ecosystem and Land-Use Sustainability Phase			
Pasture			
Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use	•	•	•
For Grassland areas, groundcover targets: - 0-20% canopy	✓	✓	✓
- 70-100% groundcover	✓	✓	•
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	•	•	•
Weeds comprise no more than 20% of ground cover vegetation	✓	•	•

• *- Management Actions Required* ✓ *- Management Actions Successful*

TABLE 8-2 COMPARISON OF MONITORING RESULTS TO TRIGGER, ACTION RESPONSE PLAN

Trigger (MOP Extract)	Comment	Remediation Action
Hazardous Materials (asbestos) Inappropriately removed during demolition of heritage structures, leading to soil contamination and/or health impact	No hazardous materials identified.	Not required
Landform not in accordance with DRE requirements (i.e. not within MOP completion criteria including capping material depth)	Landform is generally in accordance with final landform.	Implement identified investigations and assessments to further support 1 meter capping layer.
Erosion / poor water quality from rehabilitation areas (in excess of target criteria identified in **MOP Table 6.1**).	No erosion identified. Water quality not assessed as part of this program of work.	Not required
Lack of vegetation establishment or dieback of rehabilitated areas resulting in inability to meet vegetation criteria targets specified in **MOP Table 6.1**.	No substantial dieback identified. Target species lacking in each REA.	Undertake soil amelioration as per recommendations of SESL (2020). Re-seed identified bare areas utilising appropriate species as per target final land use.
Weed infestation threatening rehabilitation success (weeds in excess of identified criteria level (refer to **MOP Table 6.1**).	Weed infestation threatens each of the REAs.	Implement weed management and control actions as required. Re-seed utilising appropriate species as per target final land use where necessary.
Significant damage to rehabilitation areas by feral animals, resulting in inability to meet vegetation criteria targets specified in **MOP Table 6.1**	Low levels but not causing significant damage	Not required
Acid leachate identified from rehabilitated reject emplacement areas, potentially resulting in offsite water impact and/or dieback of revegetation, resulting in inability to meet vegetation criteria targets specified in **MOP Table 6.1**	No evidence of acid leachate identified.	Not required
Spontaneous combustion of rehabilitation area	No evidence of spontaneous combustion observed.	Not required

8.3 Rehabilitation Maintenance

The southern end of the Aberdare Reject Emplacement Area was rehabilitated in the 2012 – 2013 reporting period. Monthly inspections and the annual Rehabilitation Monitoring program identified that there were areas within the rehabilitation that were bare of vegetation. During the previous

reporting period, these areas were scraped and a growth medium applied. During this reporting period, soil testing was undertaken and the recommended organic matter, fertiliser and seed were applied. At the end of the reporting period, the areas were germinating well. Success of maintenance and repair activities will be assessed during annual rehabilitation monitoring during the next reporting period.

8.4 Rehabilitation Trials and Research

A geotechnical study on emplacement of reject for the management of potential combustion risk has informed the Austar CHPP Reject Haulage and Emplacement Area Procedure. The procedure requires tipped reject be levelled and spread in layers no more than 300mm and be compacted at no more than four weekly intervals to minimise the risk of spontaneous combustion.

A further geotechnical study assessing capping layer requirements to manage potential combustibility and acid generating potential of emplaced coarse reject has commenced. Initial findings indicate:

- The coarse rejects within the emplacement areas (Aberdare Emplacement Area and East Pit Emplacement Area) have a low risk of spontaneous combustion when compared to the NSW EPA Resource Recovery Order concentrations for combustible content.
- A cap is required to minimise the risk of generation of acid leachate as the coarse rejects has been shown to have a high propensity to generate acid leachate.
- For a rehabilitated area comprising managed grassland, the risk of combustion of the placed material is considered to be low provided it is appropriately covered with a low combustibility capping material. Therefore, for managed grassland, the thickness of the capping layer is predominantly based on the need to preclude infiltration of water in the coarse rejects to minimise the risk of acid generation. Subject to further field trials, it is considered that a 1 m cap would be suitable for the emplacement areas.

Recommended additional investigations and assessments to further support a 1 metre capping layer include:

- Field trial to assess suitability of capping layer to minimise the risk of acid leachate generation. This may include monitoring of seepage through the capping layer;
- If emplacement areas are to be forested following mine closure, further characterisation of the combustibility of the coarse rejects in the emplacement areas to assess the suitability of a 1 m thick capping layer;
- Investigations into the volume and suitability of capping material stored within the West Pit, including permeability testing and compaction achievability;
- Installation of groundwater monitoring wells within the emplacement areas to monitor groundwater levels and allow assessment of the efficiency of the drainage in to underground workings;

- Surface water quality monitoring of any water shedding off the placed capping layer to assess for any potential impacts resulting from the emplacement area. Currently surface water sheds to the centre of the emplacement areas and is sent underground.

8.5 Rehabilitation Summary

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

TABLE 8-3 REHABILITATION SUMMARY

Mine Area Type	Previous Reporting Period (ha)	This Reporting Period (ha)	Next Reporting Period (ha)
	2018-19	**2019-20**	**2020-2021**
Total Mine Footprint	182.01	187.9*	187.9
Total Active Disturbance	137.01	141.3*	141.3
Land being Prepared for Rehabilitation	0.93	0	0
Land under active Rehabilitation	44.07	46.6*	46.6

** Change from 2019 Total Mine Footprint (ha), Total Disturbance Area (ha) and Land Under Active Rehabilitation (ha) is the result of reconciliation against MOP Plan domains.*
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.*

8.6 Rehabilitation Actions for the Next Reporting Period

The following actions are proposed for the 2020-21 reporting period:

- Implement the recommendations of the rehabilitation monitoring report as detailed in **Section 8.2**.

- Maintain and enhance existing rehabilitated areas at Aberdare reject emplacement area, Area 12 and Area 13.
- Progress the mine closure planning strategy as documented in MOP Amendment A, lodged with Resources Regulator for approval on 1 July 2020.

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 23 September 2019 to 4 November 2019. Successful funding applicants include:

- Abermain Public School – Carols by Candlelight
- Bellbird Public School P&C Association – Cultural Learning Area
- Branxton Croquet Club – Club Improvements
- Branxton Greta Colts Rugby League Football Club – NRL State of Mind Program
- Cessnock Evening Country Women's Association – Rear Entry Upgrade
- Cessnock High School – Pond to Plate Program
- Hunter Hands of Hope – Meals for homeless, disadvantaged and vulnerable people
- Hunter Prelude Early Intervention – Kurri Playgroup
- Nulkaba Public School – Pollinators Paradise

As Austar is currently in a care and maintenance phase, future community support programs will be suspended until operations resume.

9.2 Community Sponsorship

In addition to the Community Support Program, Austar sponsors local community initiatives. In the 2019-2020 reporting year sponsorship included:

- Cessnock Council Bushland Festival
- Kurri Kurri Rugby League sponsorship
- Cessnock Rugby League sponsorship
- Paxton Bowling Club

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 2019-2020 reporting period. The CCC is conducted generally in accordance with the DPIE's Community Consultative Committee Guideline (January 2019). Current members of the CCC are listed in **Table 9-1**. During the reporting period Austar held three CCC meetings, which occurred on the following dates:

- 28 August 2019;
- 27 November 2019
- 26 February 2020

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 Ms Ashlee Baker Mr John Rayner Mr Peter Sturrock Chief Inspector Michael Gorman
Company Representatives	Mr William Farnworth Ms Carly McCormack Ms Julie McNaughton

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 2019-2020 were:

- Current mining operations – underground, CHPP, Exploration, Bellbird South Area progress, Stage 3 progress, staff reductions, Resource Regulator notices, transition to Care and Maintenance;
- Environmental monitoring, results and incidents;
- Community complaints; and
- Community sponsorships.

During the February 2020 meeting, the transition to care and maintenance was discussed and the CCC decided to change the frequency of meetings from quarterly to half-yearly.

9.3.2 Resident Consultation

During the 2019-2020 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.

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, as well as notification of the transition to care and maintenance. There were two updates provided to landholders in the Bellbird South Mining area and one update to landholders in the Stage 3 mining area during the reporting period.

Additionally, during the reporting period planning for the drilling of five exploration drill holes commenced. Consultation with landholders was undertaken to identify areas within EL 6598 that were suitable drilling locations and that the landholder was willing to enter in to an access agreement. Areas where drilling may occur are limited by various factors, including the target geology, presence of protected ecosystems, houses and gardens, and creeks and rivers.

During the next reporting period, there will be broader consultation with the community prior to commencement of the drill program, in accordance with the EL 6598 Community Consultation Strategy.

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 the 2019-20 reporting period one complaint was received regarding air quality from the Aberdare Emplacement Area impacting a community members pool.

Details of the complaints are provided in **Table 9-2**.

TABLE 9-2 COMMUNITY COMPLAINTS SUMMARY

Time and Date	Category	Detail	Follow Up Actions
22/02/2020 11:51 (email)	Air Quality	Complainant stated dust from the Aberdare Emplacement Area was impacting his pool causing an uncleanable ring around the pool and making it unusable over the Christmas period due to high dust levels.	E&C Superintendent phoned back 24/2/2020. E&C Superintendent discussed elevated dust results recorded across all mine dust monitors from Nov 19-Jan 20 resulting from regional dust storms and bushfire events. Also discussed that capping and topsoiling of 1 ha of coarse reject was completed in Q4 2019 and soil

Time and Date	Category	Detail	Follow Up Actions
			samples had been taken 21 Feb to guide revegetation of the area, which is to be seeded Q1 2020.

10 INDEPENDENT ENVIRONMENTAL AUDIT

An Independent Environmental Audit was conducted by SLR Consulting in November 2017. 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 have been completed. The outstanding actions from the audit are listed in **Table 10-1**.

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. Heritage assessments will be undertaken as part of the mine closure planning process.
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.	Capping studies have progressed and have recommended additional investigations and assessments to further support a 1 metre capping layer. Refer **Section 8.4.**

The Independent Audit report can be found on the Austar website.

The next Independent Environmental Audit is scheduled to be undertaken during October and November 2020.

11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

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

TABLE 11-1 INCIDENT REPORTS 2019-2020

Incident No.	Date	Incident Details	Follow Up Actions
1	9-Feb-20	Kitchener Sedimentation Dam Discharge Kitchener sediment dams are designed to catch runoff of 90th percentile 5-day rainfall events of 42.8mm. 113.8mm of rain was received over approximately 3.5 days, and the dams overtopped. Refer **Section 7.3.4** for further detail.	NSW EPA, DPIE and Resources Regulator were notified, water samples collected and an incident report was submitted. Based on the review of water sampling results, there was unlikely to be any material harm caused by the incident. All agencies have advised no further action would be taken at that time.
2	15 May – 9 June 2020	HVAS not operational Landowner was conducting property improvement works and disconnected the power to HVAS1. Four monitoring events were not captured.	Power reinstalled as soon as possible. DPIE was notified and has advised no enforcement action will occur at this time.
3	5 – 10 June 2020	TEOM not operational Flash card that holds the operating system failed on 5 June 2020. A new card was sourced and installed, and the unit calibrated on 10 June 2020.	DPIE was notified and advised no enforcement action will occur at this time.

12 ACTIVITIES TO BE COMPLETED FOR THE NEXT REPORTING PERIOD

During this reporting period, the focus at Austar has been the transition to care and maintenance and addressing resultant changes to the operations. The focus during the next reporting period will be to continue to update documentation and processes for a care and maintenance phase, prepare for the IEA and progress the closure planning actions outlined in MOP Amendment A submitted to Resources Regulator for approval.

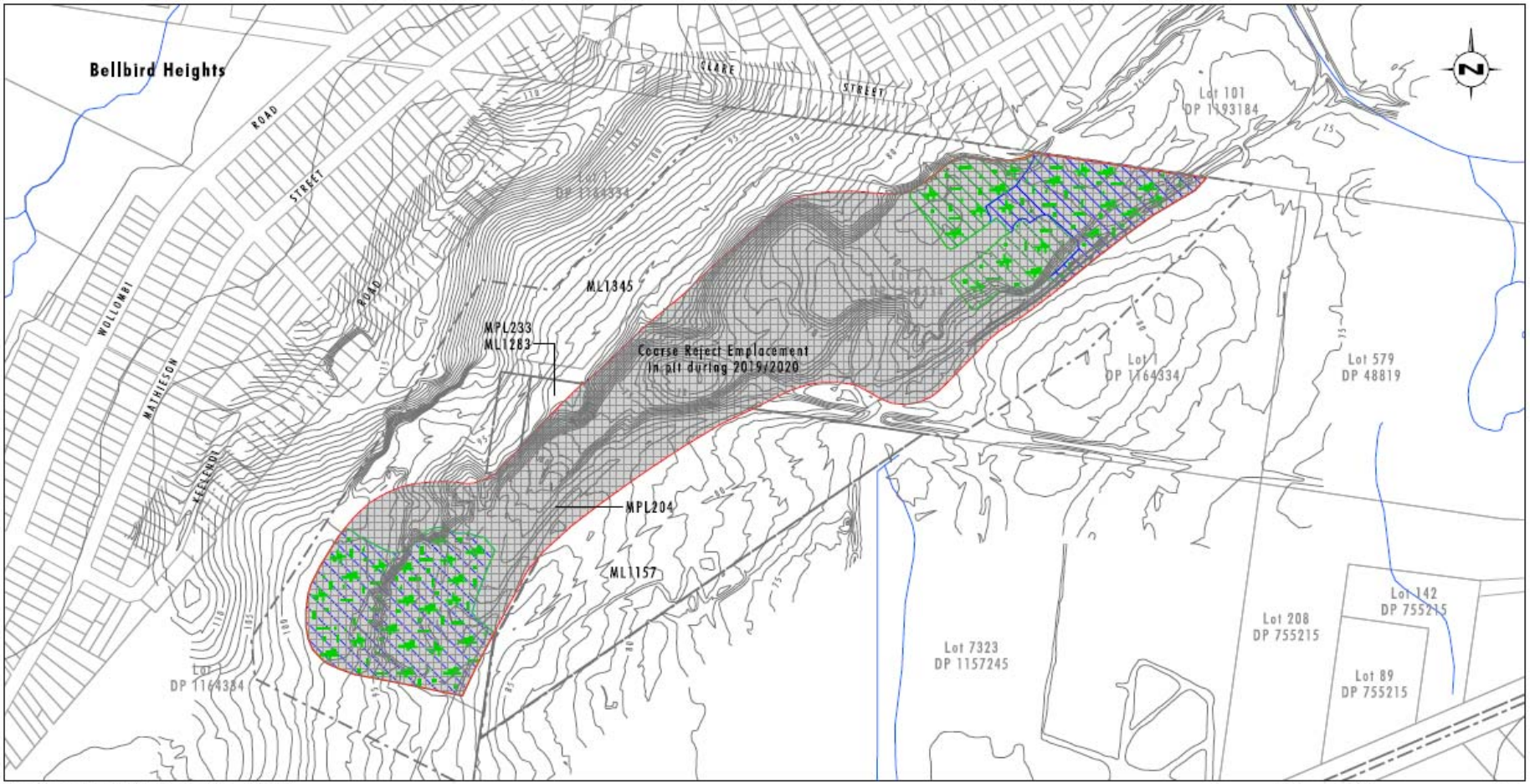
Austar will also endeavour to carry out the following activities during the 2019-20 reporting period, as outlined in **Table 12-1**.

TABLE 12-1 PROPOSED ACTIVITIES FOR 2020-2021 REPORTING PERIOD

	Activities Proposed in the 2019-20 Reporting Period
1	Progress the closure planning actions in accordance with MOP Amendment A
2	Conduct the Independent Environmental Audit
3	Continue to review and if necessary update approved management plans to reflect the care and maintenance phase
4	Enact the recommendations in the Rehabilitation Monitoring report

Plans

umwelt



Data Source: Austar Coal Mine (2020)
Note: 1m and 10m Contour Interval

0 100 200 400m
1:7500

Legend

- Mining Lease Boundary
- Reject Emplacement Area
- Drainage Line
- Contour Line
- Cadastral Line

Primary Domain:
- 2 - Tailings & Reject Emplacement Area

Secondary Domain:
- Rehabilitation Area - Grassland

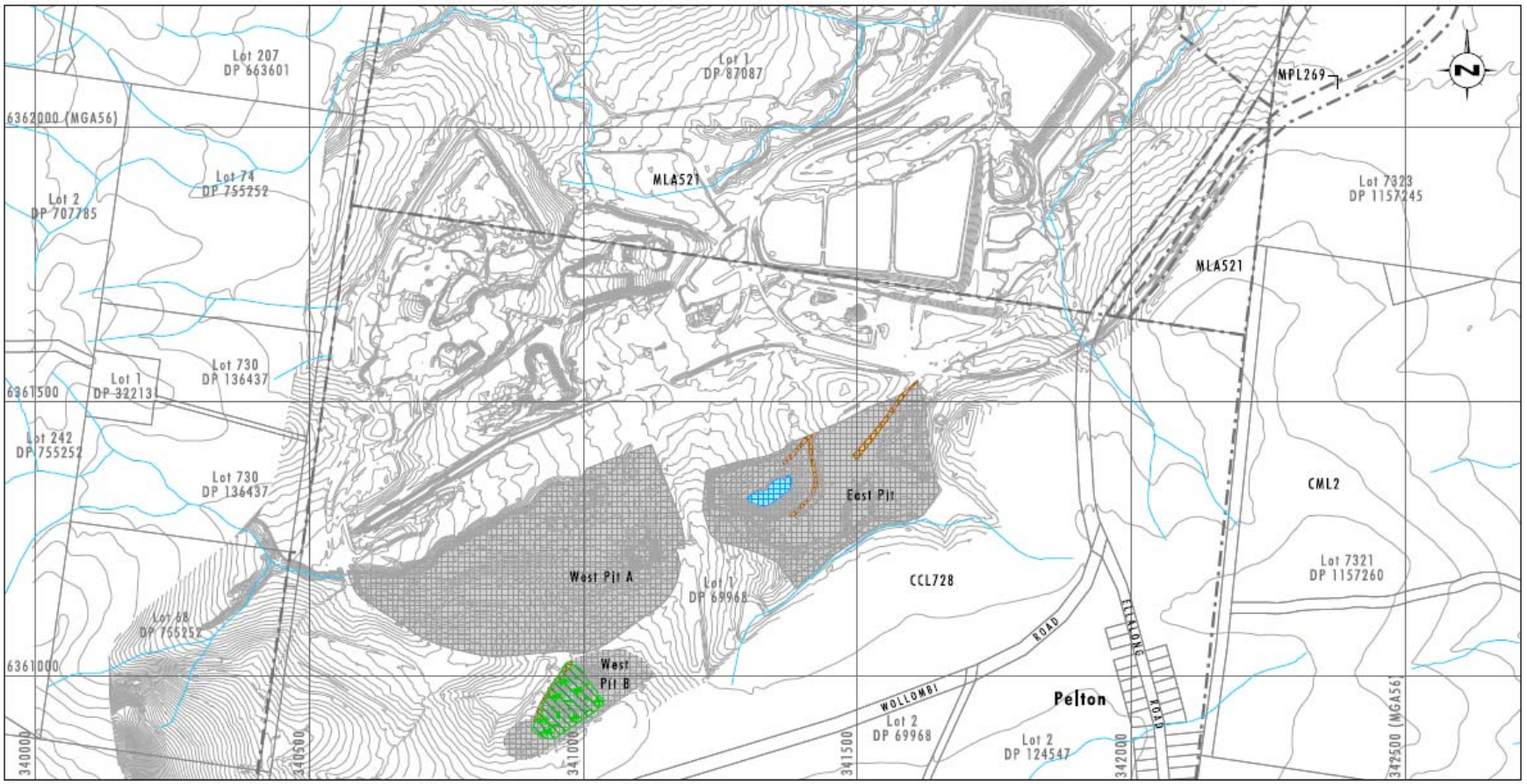
Rehabilitation Phase:
- Ecosystem and Land Use Sustainability
- Ecosystem and Land Use Establishment 2019/2020

PLAN 3B

Aberdare Extended Emplacement Area Mining and Rehabilitation 2019/2020

File Name (A4): R01/20096_001.dgn
20200624 13.15

umwelt



Data Source: Austar Coal Mine (2020), Department of Finance, Services & Innovation (2017)
Note: 1m and 10m Contour Interval

Legend

- Mining Lease Boundary
- Drainage Line
- Contour Line
- Cadastral Line

Primary Domains:
- 1 - Infrastructure Area
- 2 - Tailings & Reject Emplacement Area
- 3 - Water Management Area

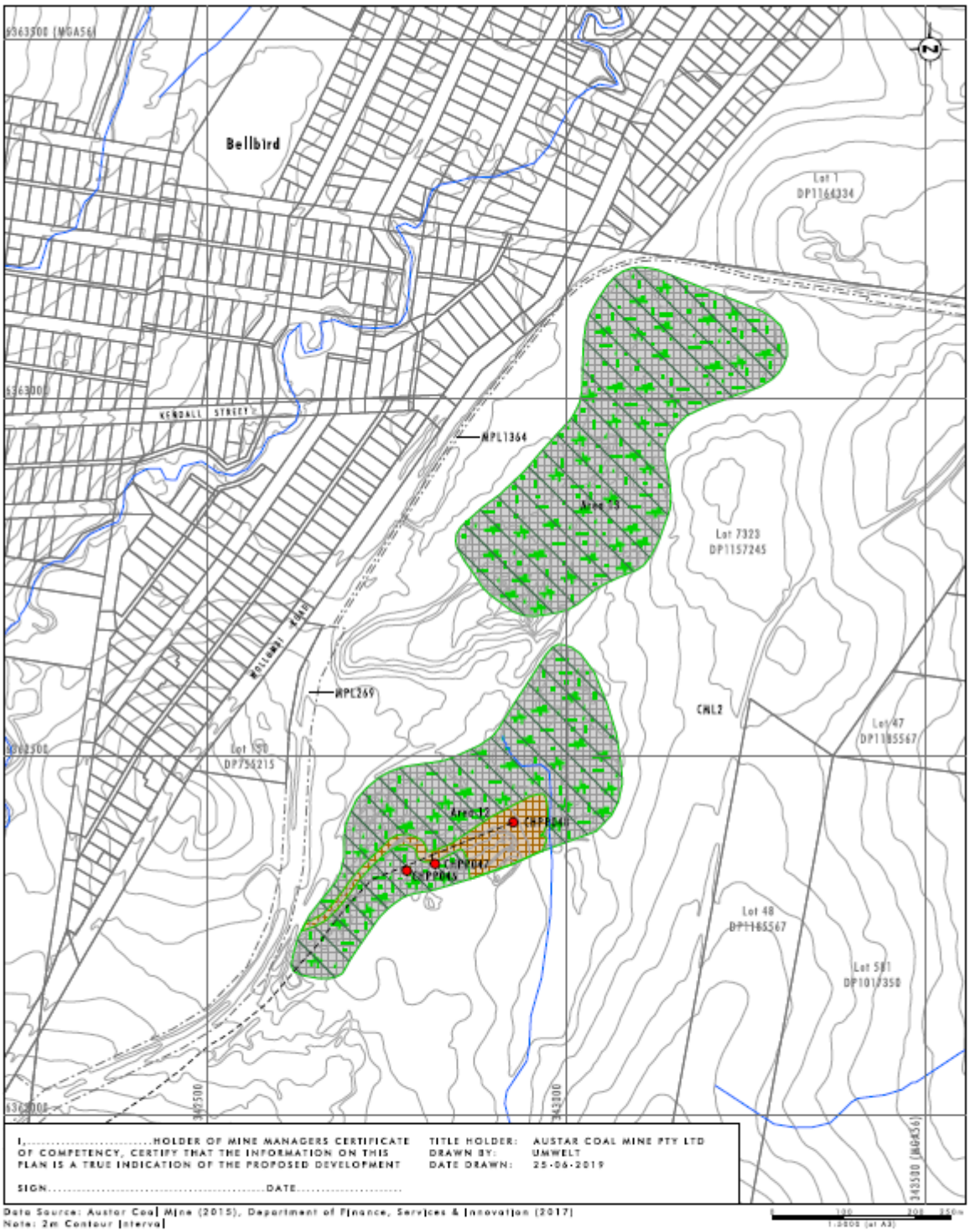
Secondary Domains:
- Rehabilitation Area - Grassland

Rehabilitation Phase:
- Ecosystem and Land Use Establishment

PLAN 3C

Austar CHPP
Mining and Rehabilitation 2019/2020

File Name (A4): R01/20096_002.dgn
20200624 16.39


umwelt
Bellbird
KENDALL STREET
MPL1364
MPL269
CWL2
Lot 7323
DP1157245
Lot 1
DP1164334
Lot 47
DP1185567
Lot 48
DP1185567
Lot 581
DP1017350
Lot 100
DP756215
I,.....HOLDER OF MINE MANAGERS CERTIFICATE OF COMPETENCY, CERTIFY THAT THE INFORMATION ON THIS PLAN IS A TRUE INDICATION OF THE PROPOSED DEVELOPMENT
SIGN.....DATE.....
TITLE HOLDER: AUSTAR COAL MINE PTY LTD
DRAWN BY: UMWELT
DATE DRAWN: 25-06-2019
Data Source: Austar Coal Mine (2015), Department of Finance, Services & Innovation (2017)
Note: 2m Contour Interval
Legend
Mining Lease Boundary
Diverter Pipeline
Bore Borehole
Drainage Line
Contour Line
Cadastral Line
Primary Domains
1 - Infrastructure Area
2 - Tailings Storage Facility
Secondary Domains
Rehabilitation Area - Grassland
Rehabilitation Phase:
Ecosystem and Land Use Establishment
PLAN 3E
Aberdare Emplacement Areas 12 and 13
Mining and Rehabilitation

Appendices

Appendix A. Groundwater Monitoring

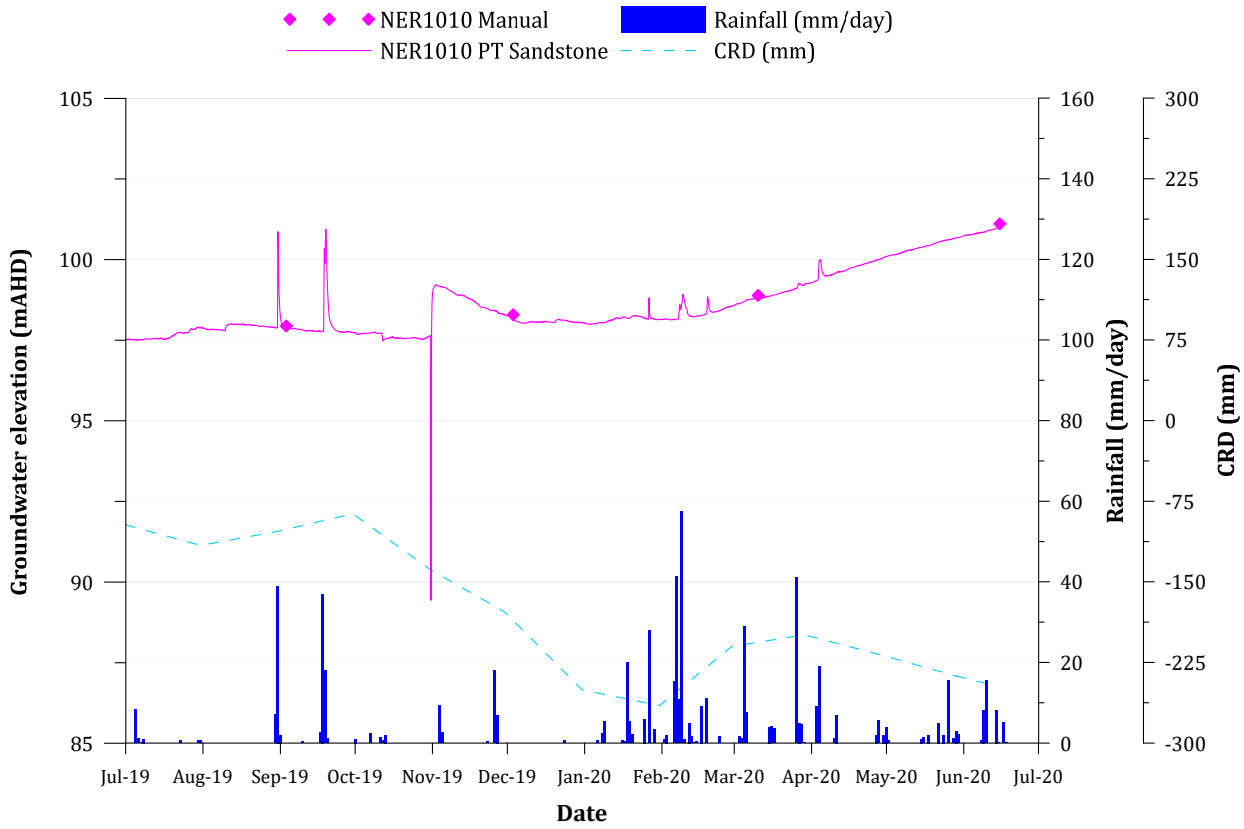


FIGURE 12-1 NER1010 GROUNDWATER LEVEL HYDROGRAPH

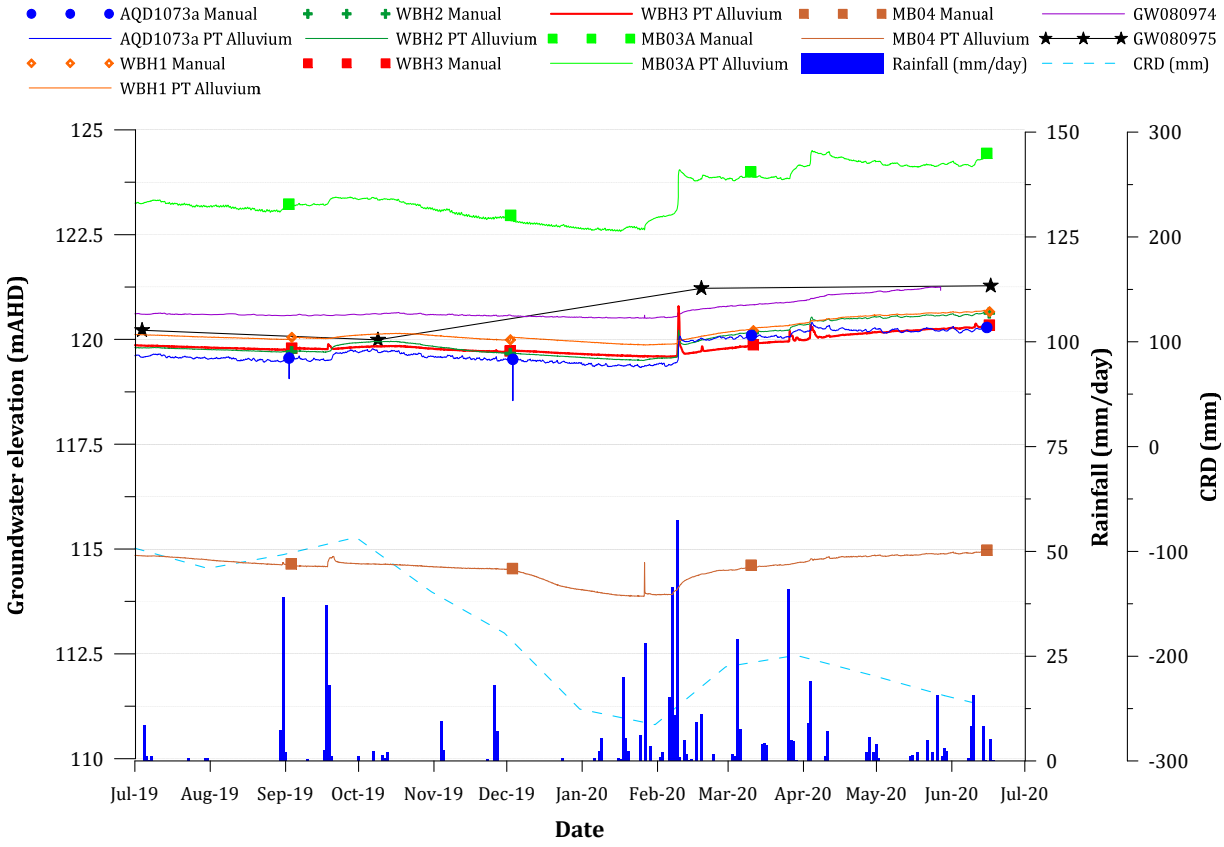


FIGURE 1-2 STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND WATERNSW GROUNDWATER LEVEL HYDROGRAPHS

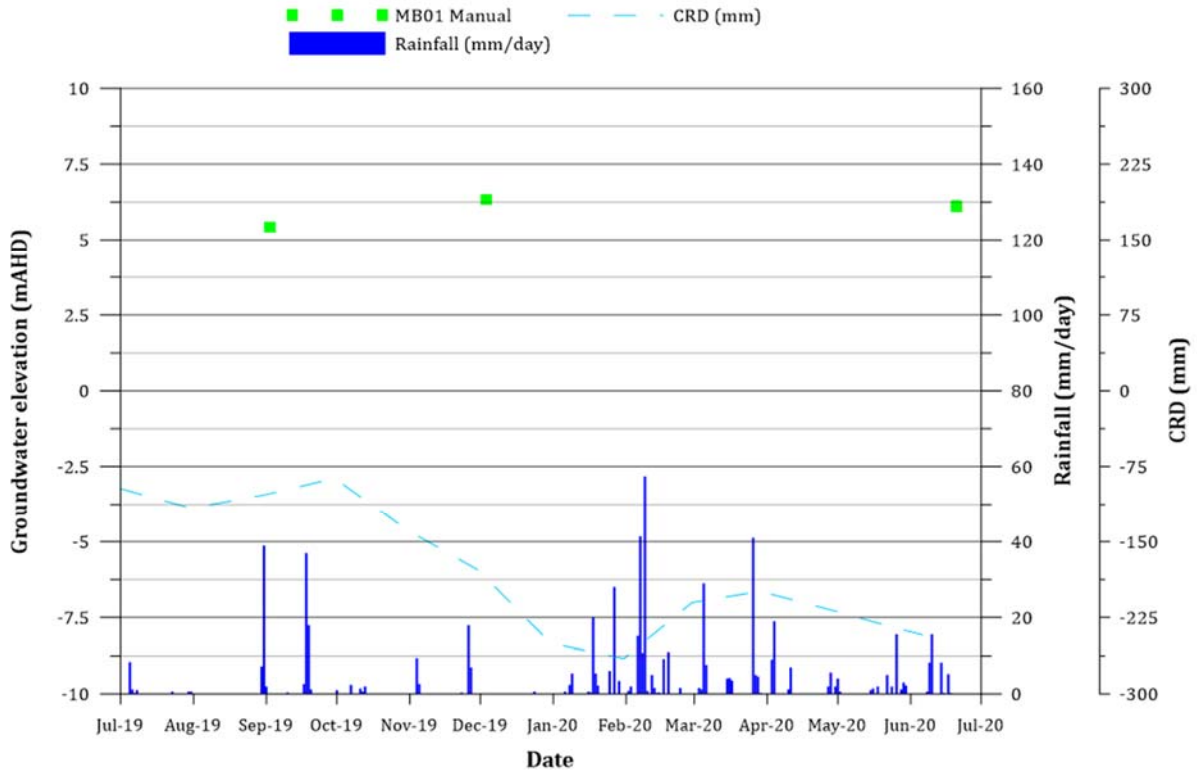


FIGURE 1-3 STAGE 3 MB01 SANDSTONE AQUIFER GROUNDWATER LEVEL HYDROGRAPH

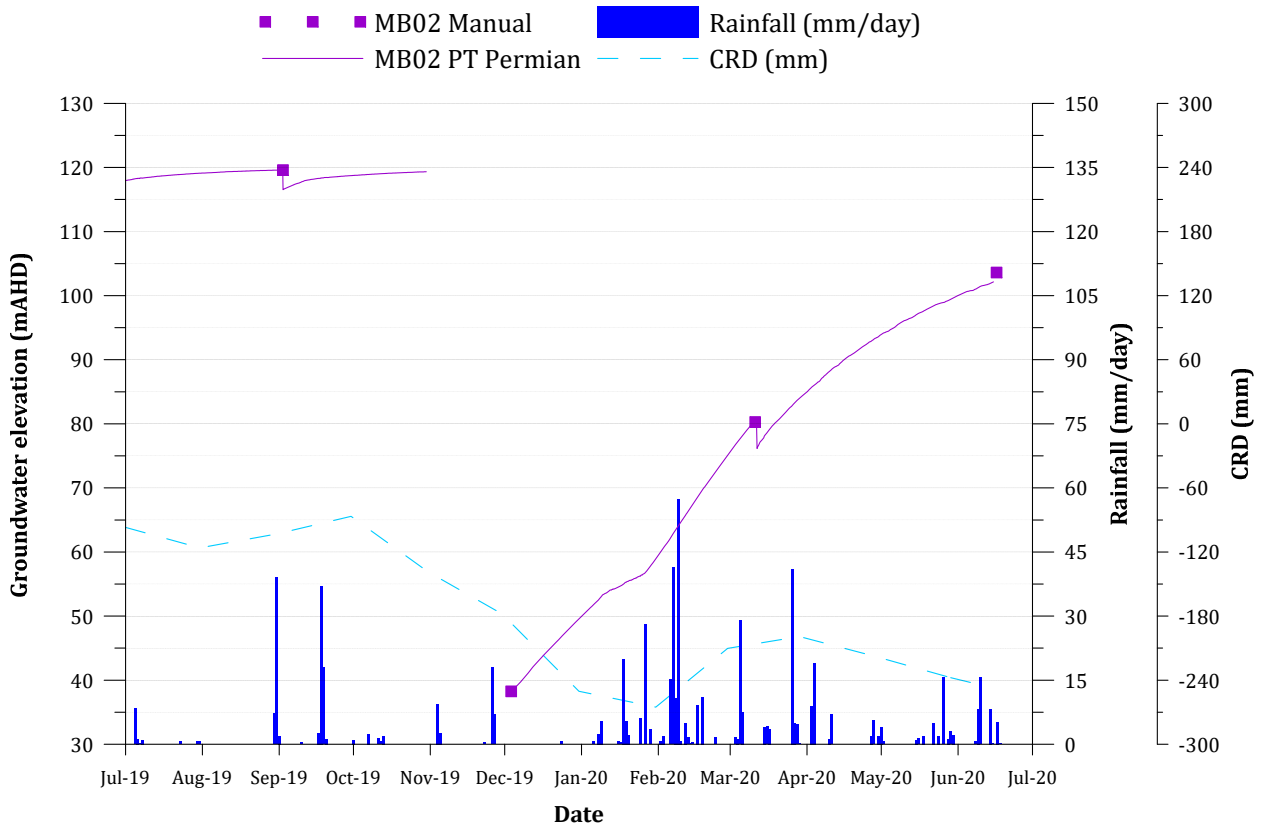


FIGURE 1-4 **STAGE 3 MB02 SANDSTONE AQUIFER GROUNDWATER LEVEL HYDROGRAPH**

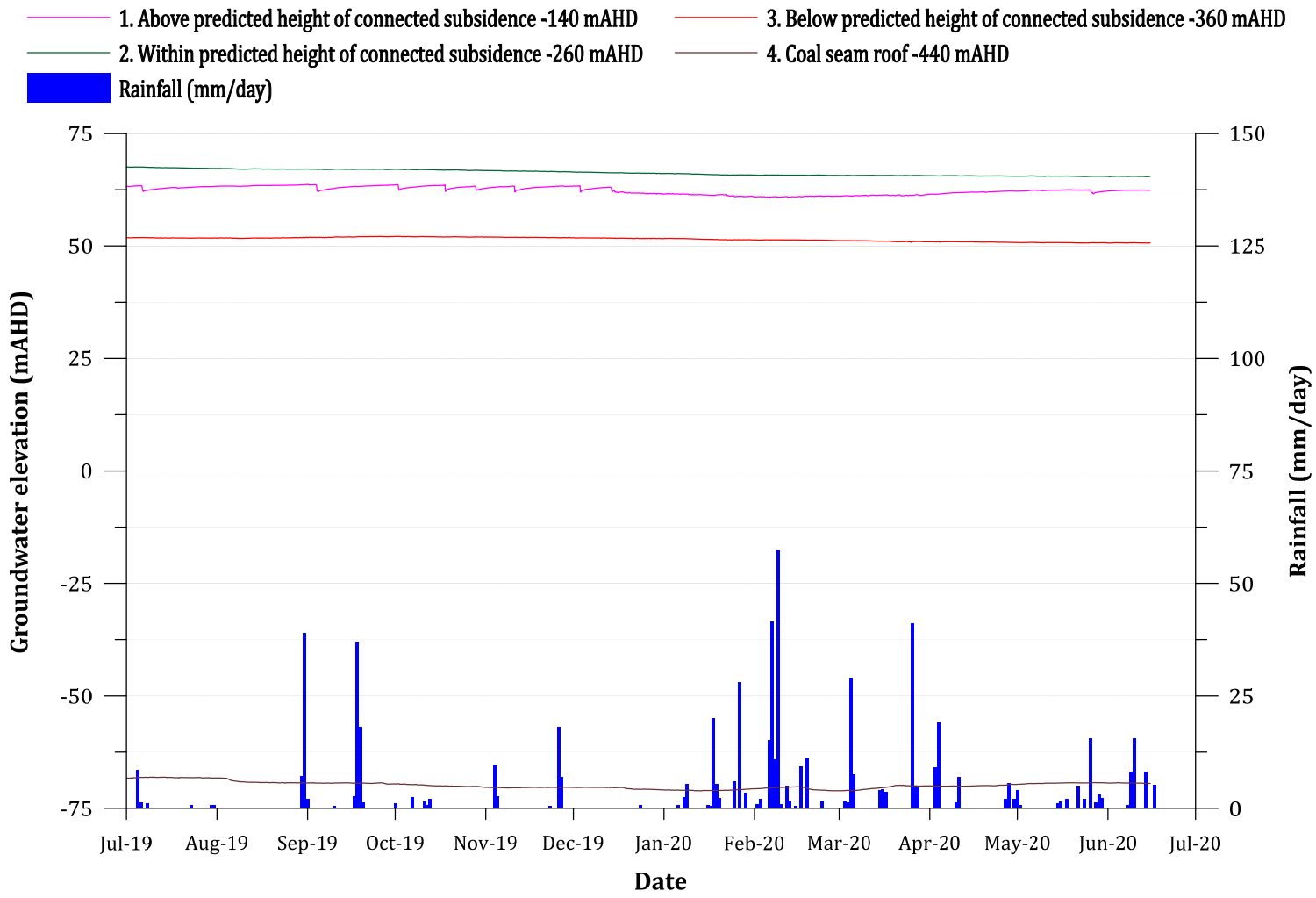


FIGURE 1-5 EX01H PIEZOMETRIC HEAD MEASUREMENTS: SENSORS NO.1 TO NO.4

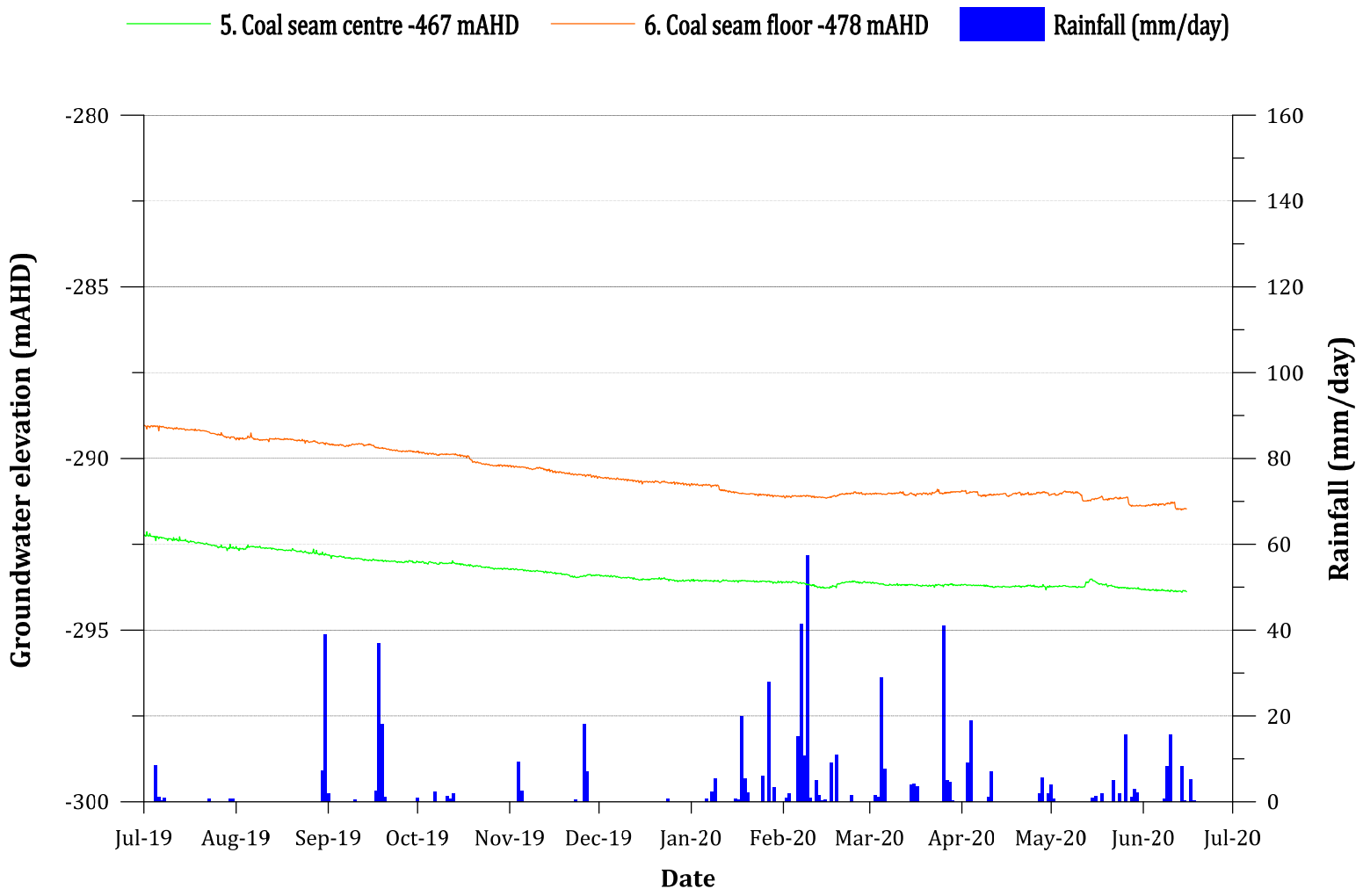


FIGURE 1-6 EX01H PIEZOMETRIC HEAD MEASUREMENTS: SENSORS NO.5 AND NO.6

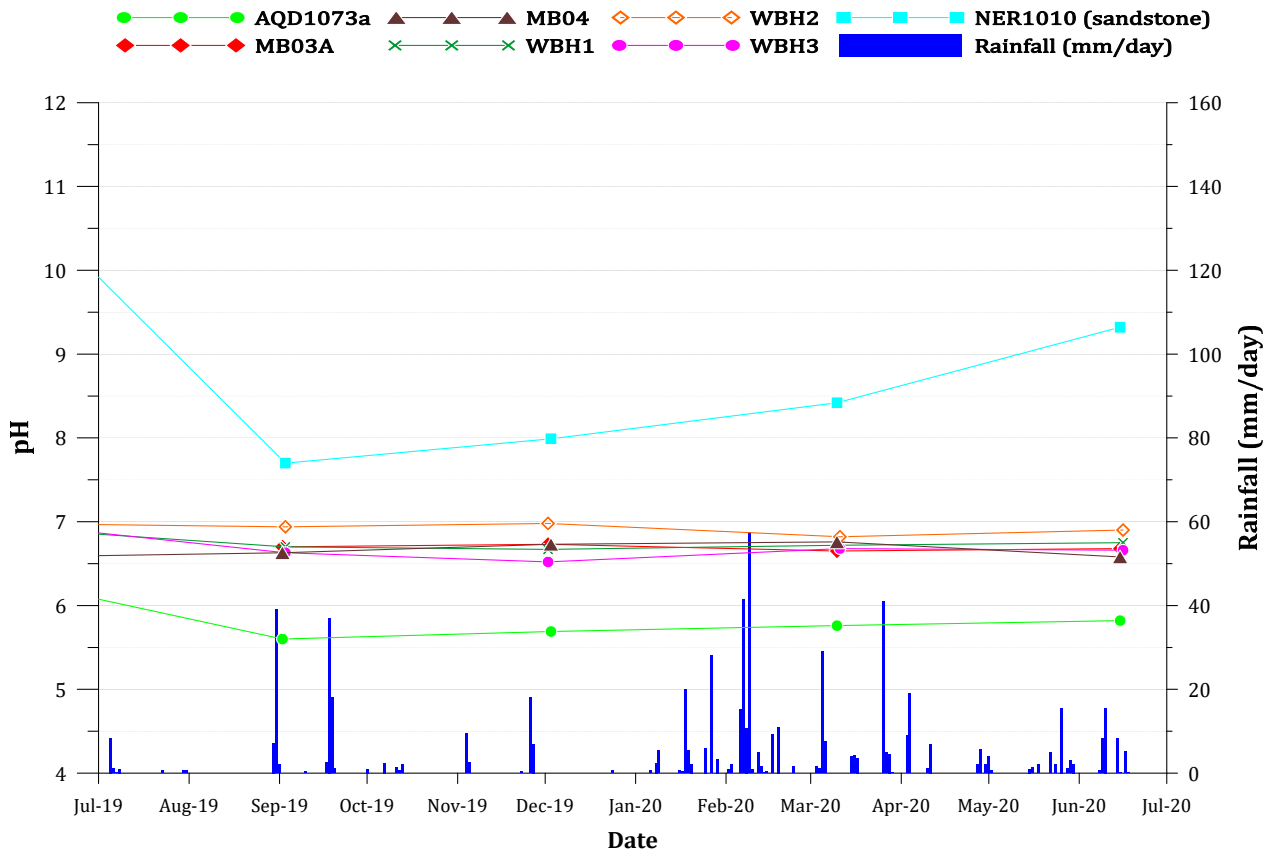


FIGURE 1-7 STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND SANDSTONE AQUIFER PH TRENDS

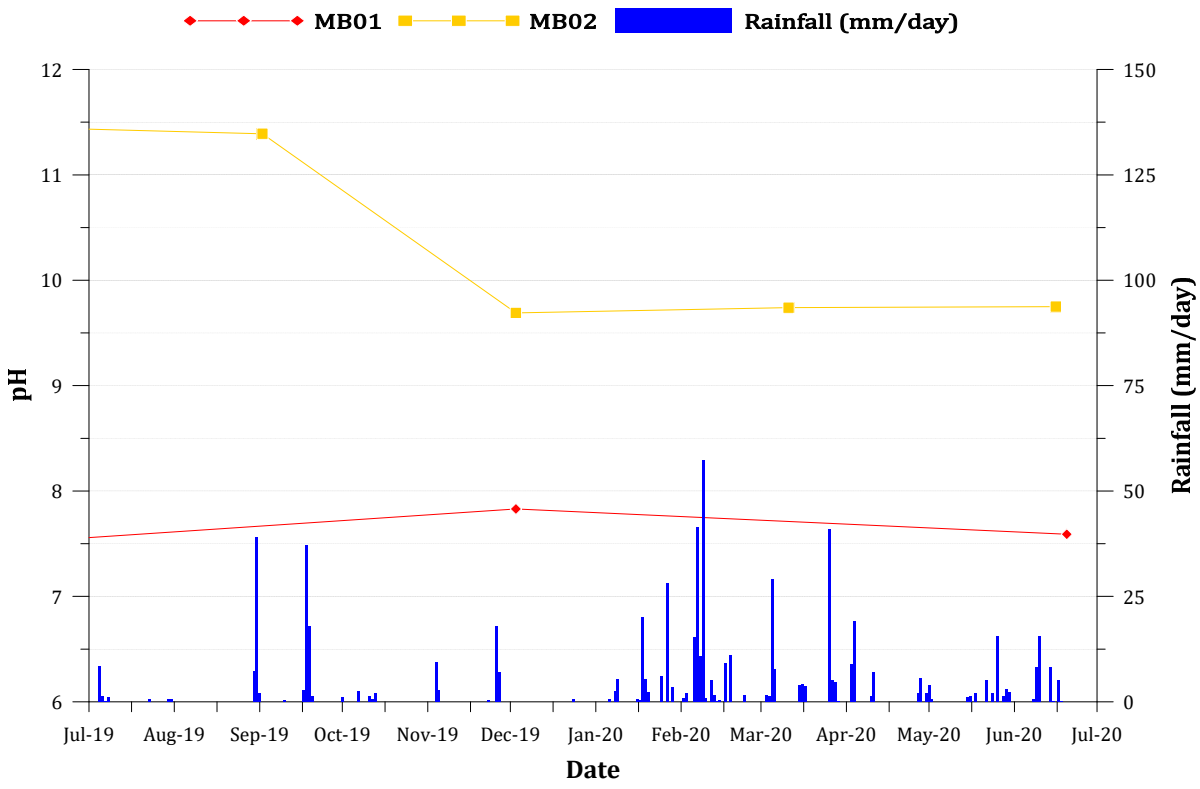


FIGURE 1-8 STAGE 3 SANDSTONE AQUIFER PH TRENDS

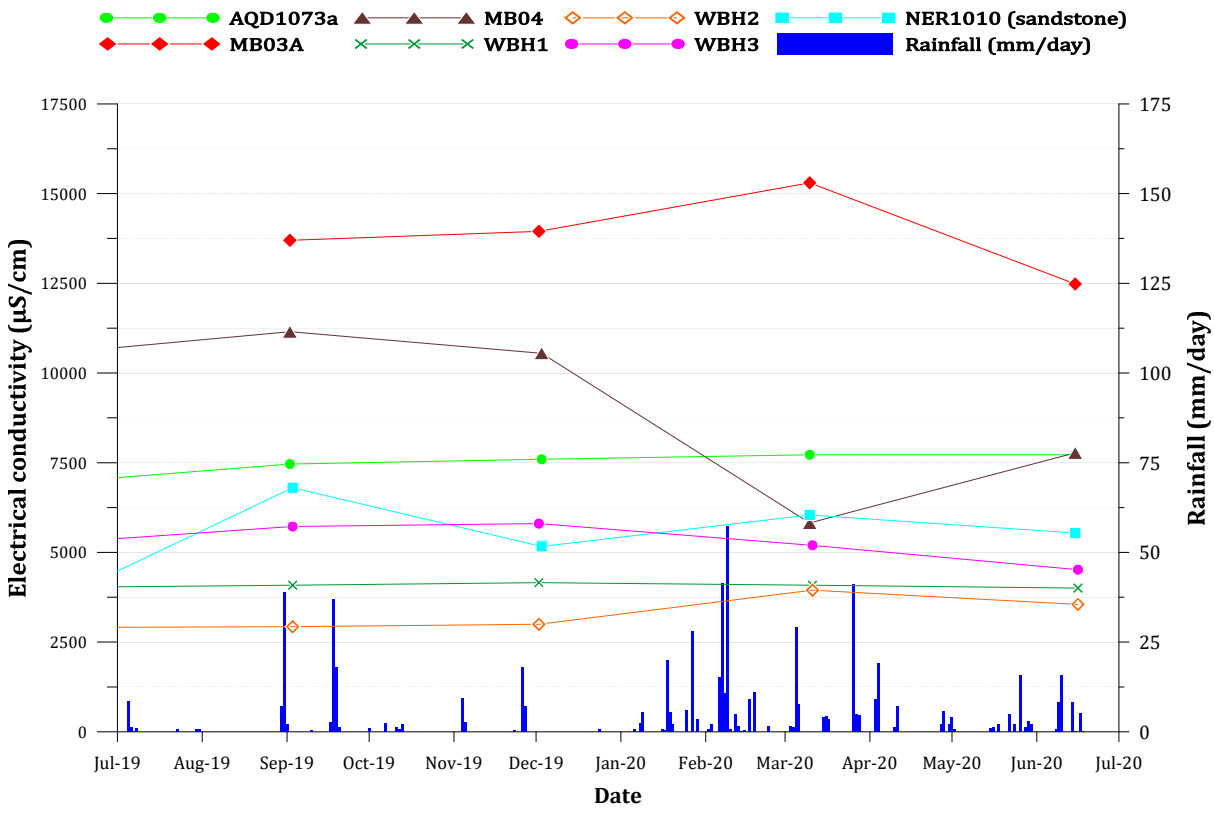


FIGURE 1-9 STAGE 2 AND BELLBIRD SOUTH ALLUVIUM AND SANDSTONE AQUIFER EC TRENDS

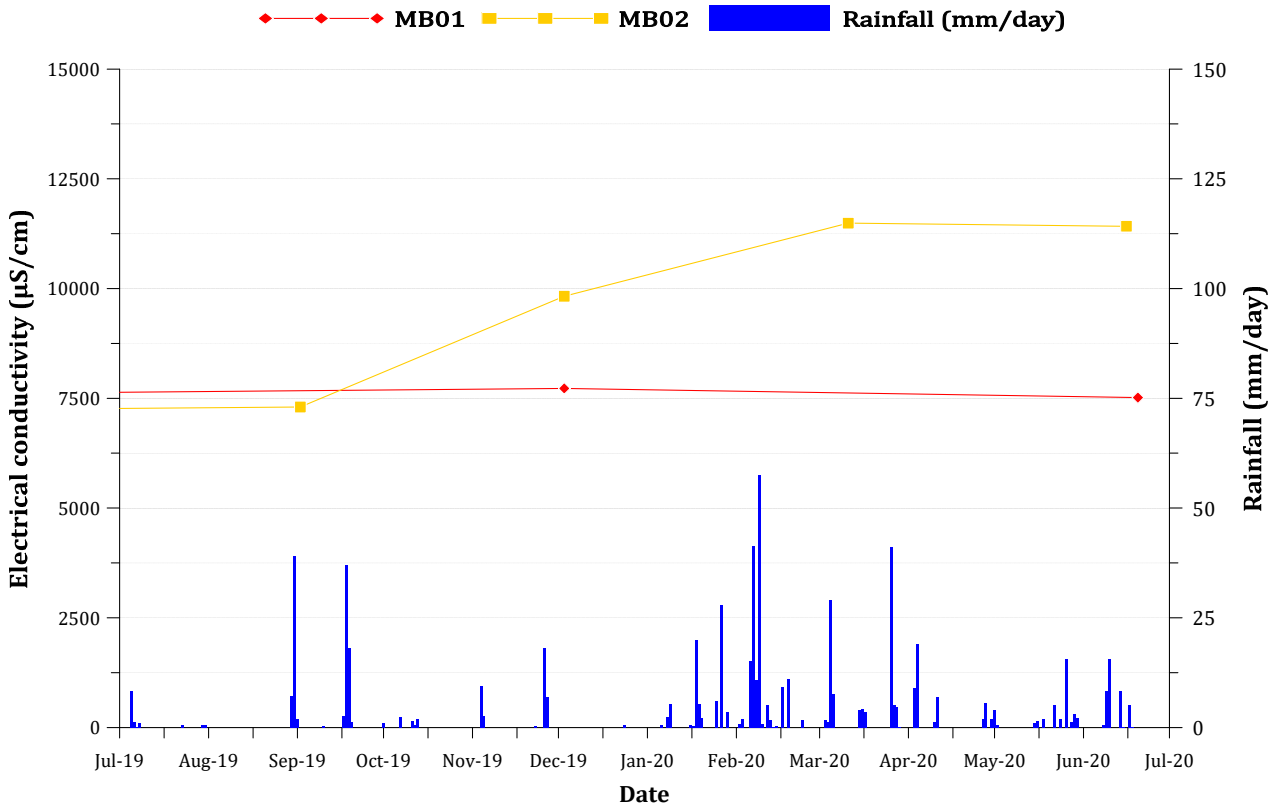
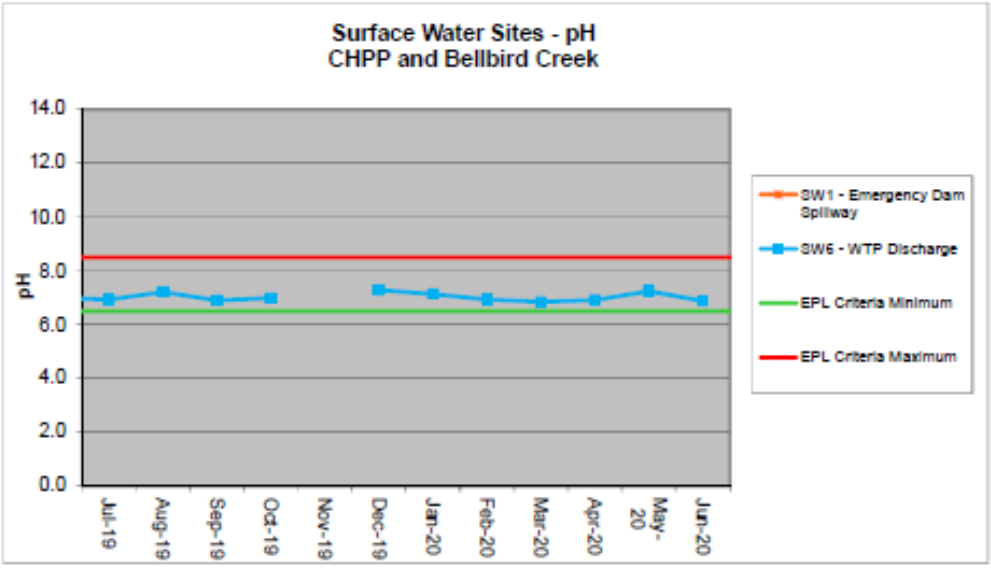
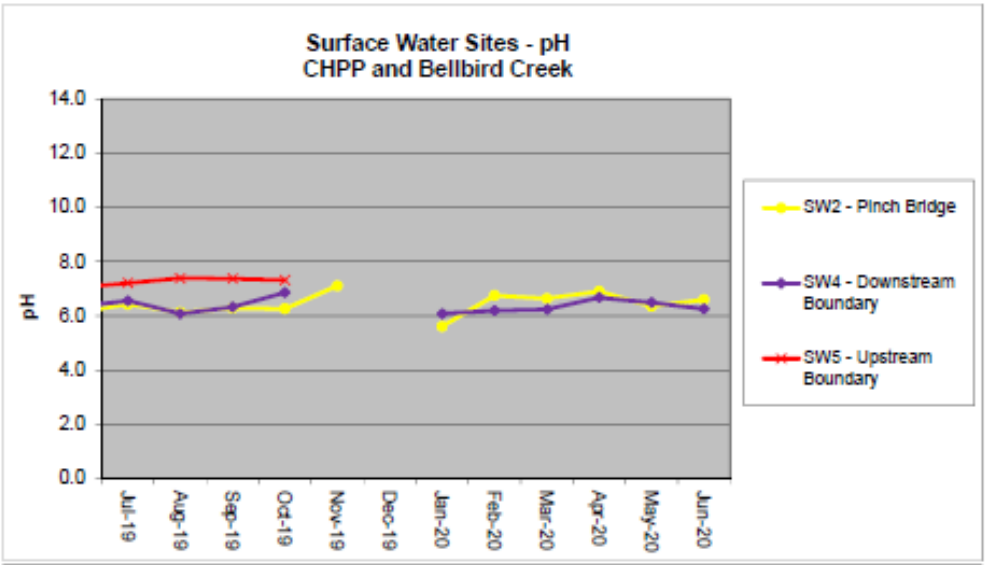
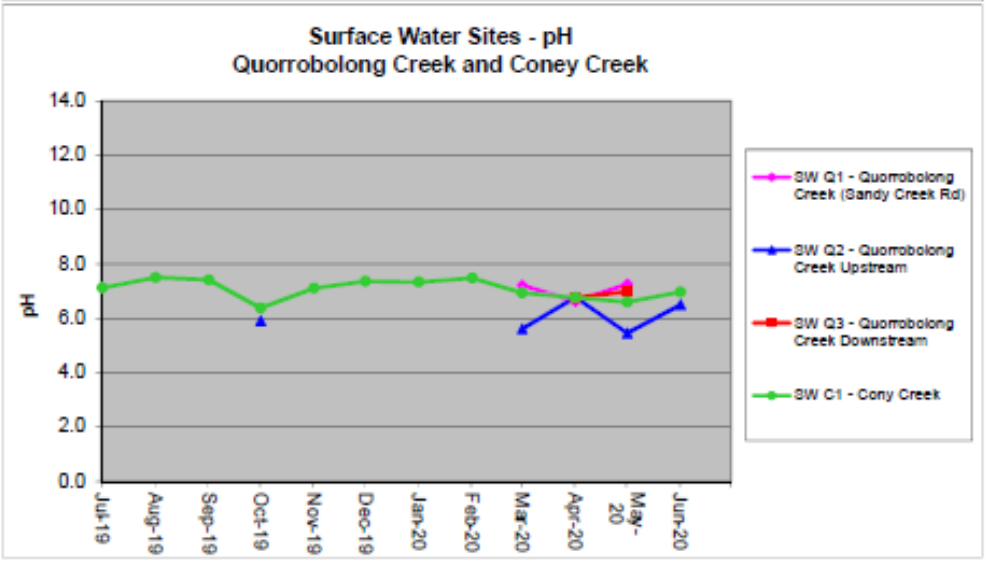


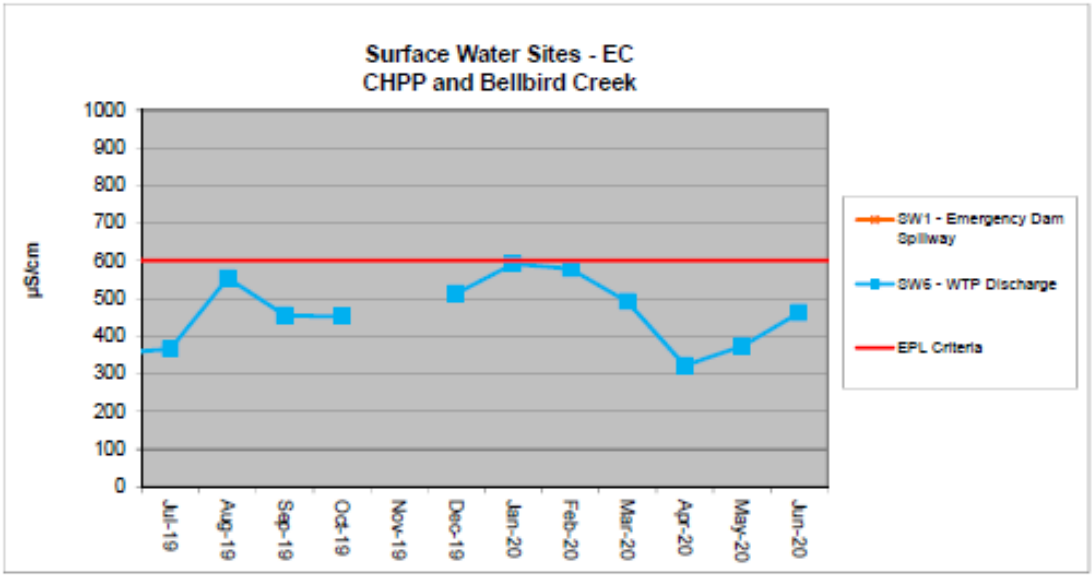
FIGURE 1-10 STAGE 3 SANDSTONE AQUIFER EC TRENDS

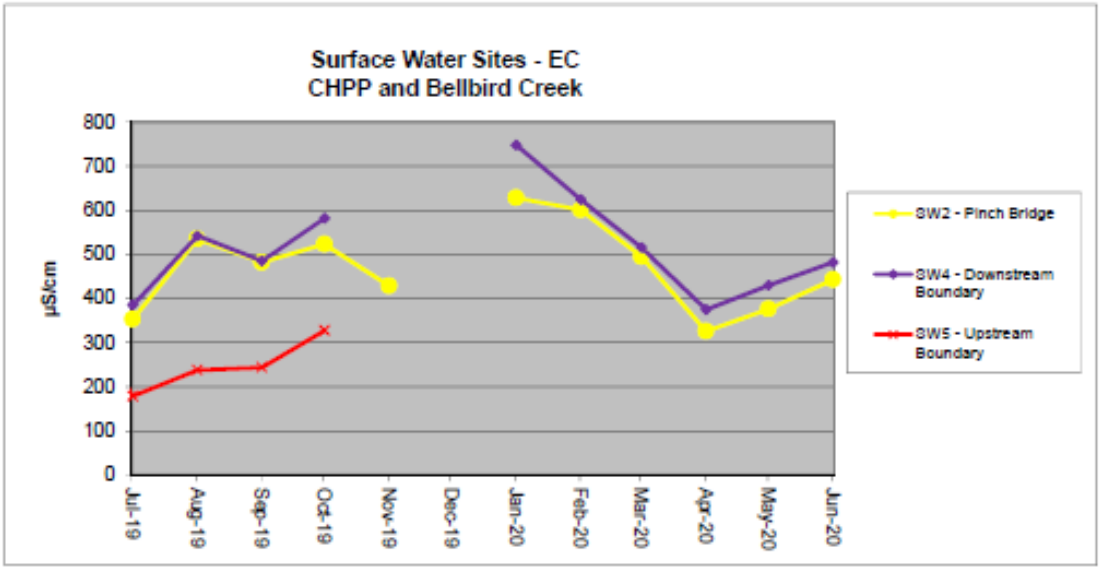
Appendix B. Surface Water Monitoring

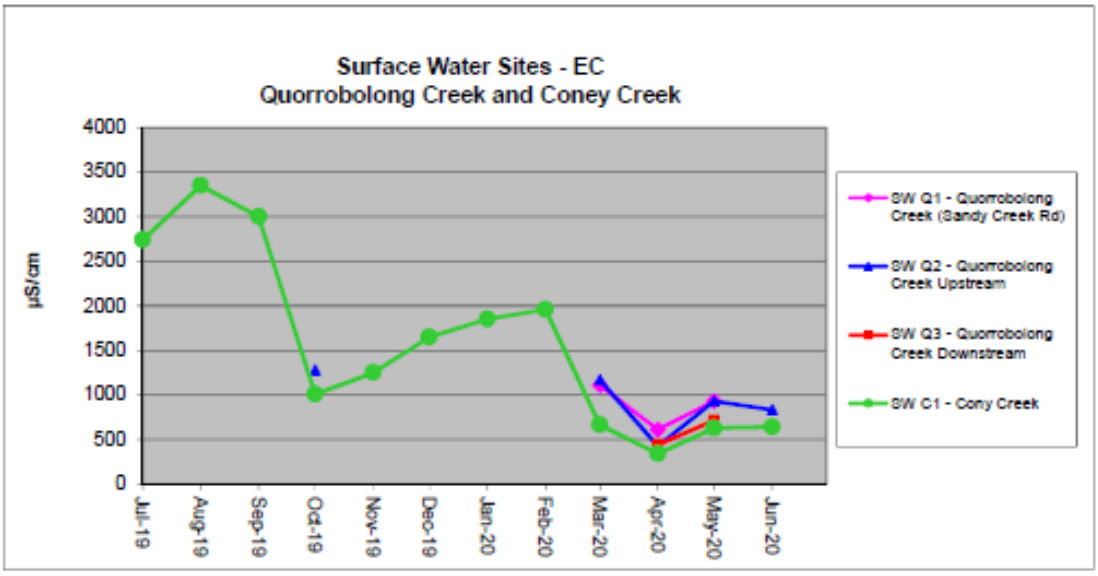

Surface Water Sites - pH
CHPP and Bellbird Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria Minimum
EPL Criteria Maximum

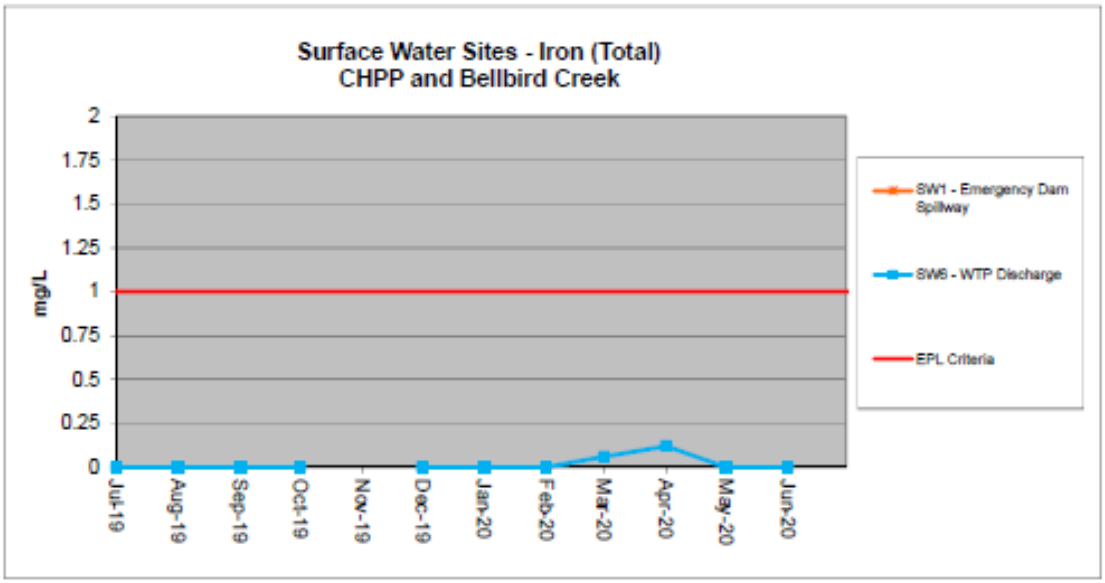

Surface Water Sites - pH
CHPP and Bellbird Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

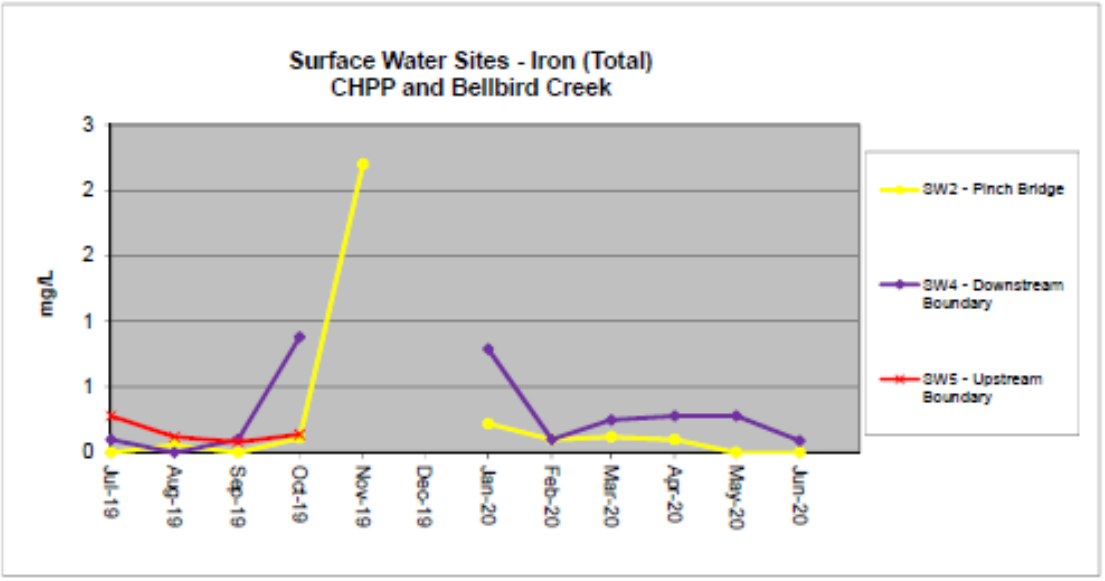

Surface Water Sites - pH
Quorrobolong Creek and Coney Creek
pH
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

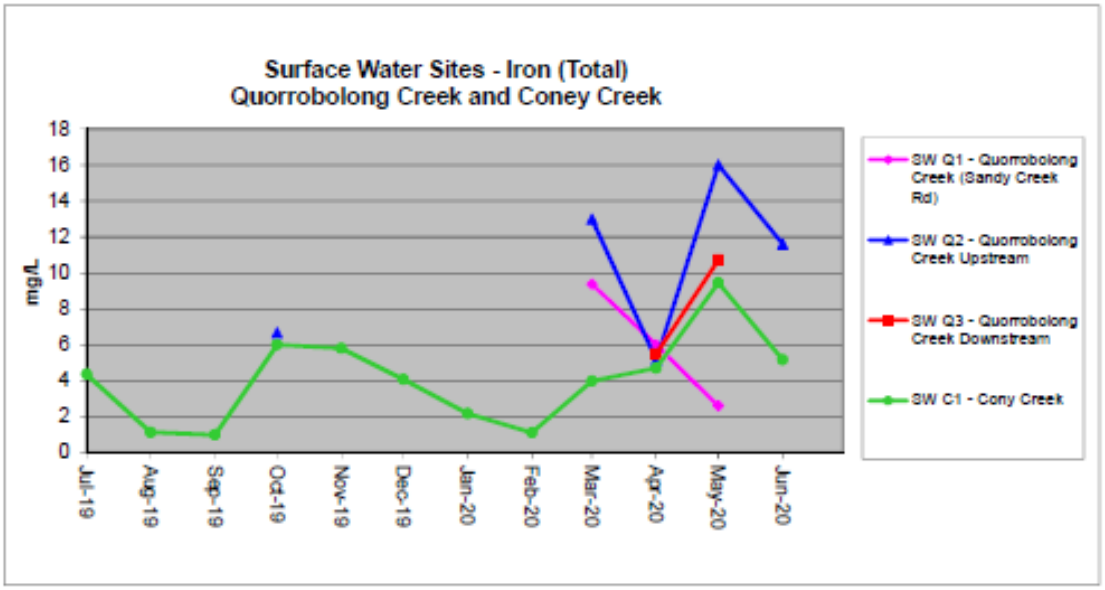

Surface Water Sites - EC
CHPP and Bellbird Creek
uS/cm
1000
900
800
700
600
500
400
300
200
100
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria

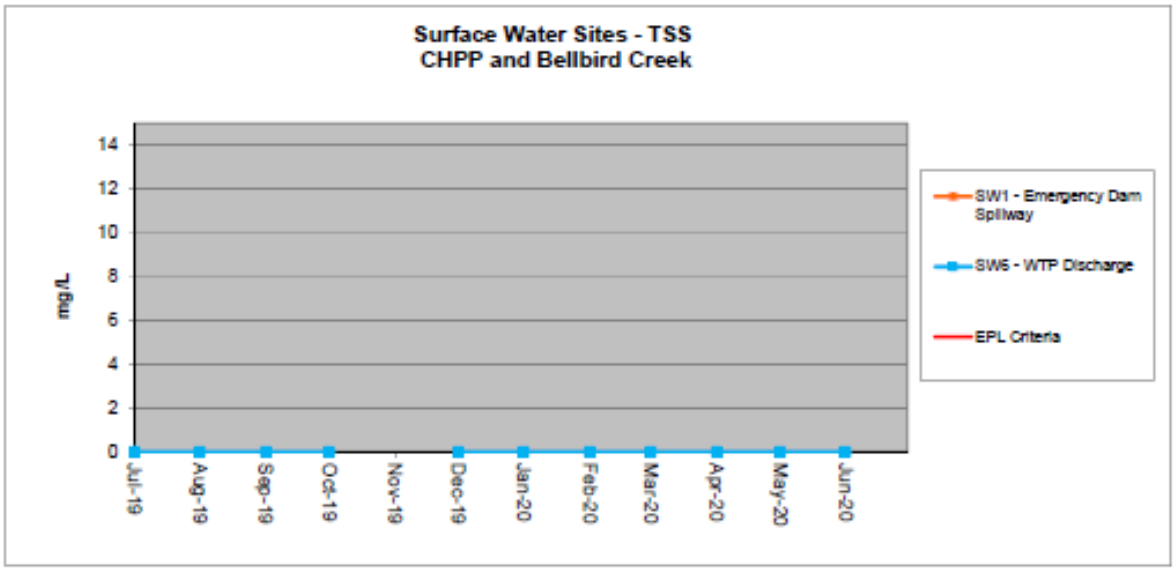

Surface Water Sites - EC
CHPP and Bellbird Creek
uS/cm
800
700
600
500
400
300
200
100
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary

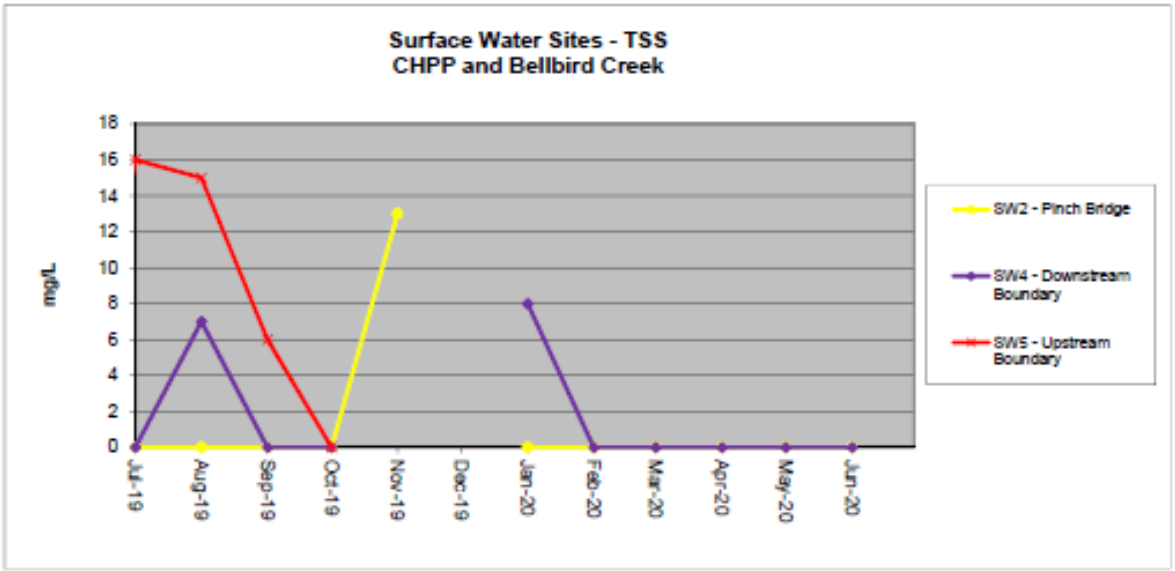

Surface Water Sites - EC
Quorrobolong Creek and Coney Creek
uS/cm
4000
3500
3000
2500
2000
1500
1000
500
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

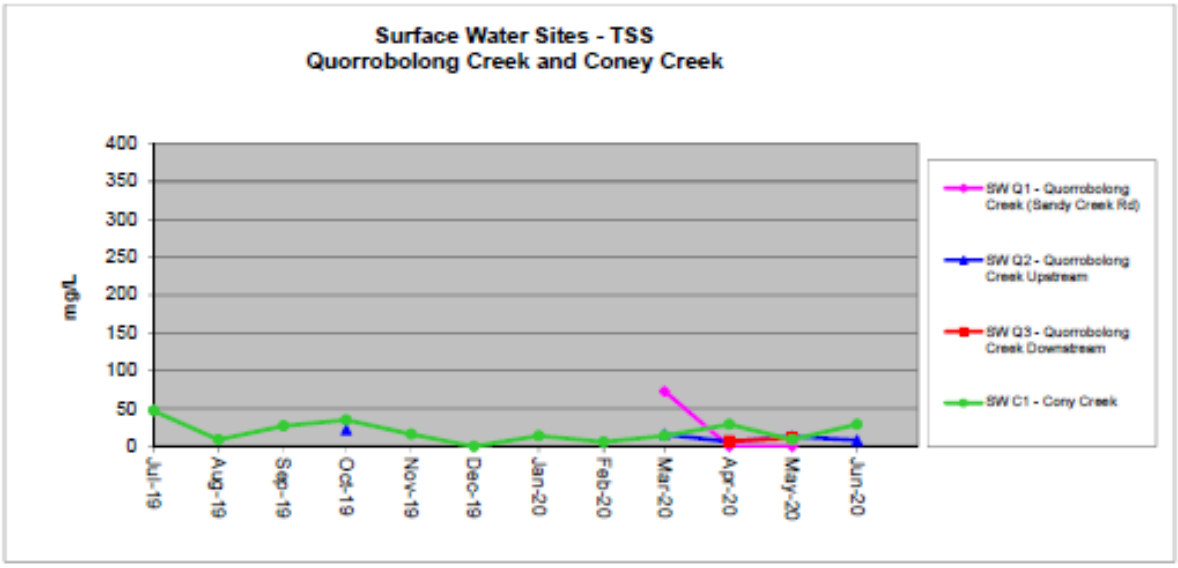

Surface Water Sites - Iron (Total)
CHPP and Bellbird Creek
mg/L
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria


Surface Water Sites - Iron (Total)
CHPP and Bellbird Creek
mg/L
3
2
2
1
1
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW2 - Pinch Bridge
SW4 - Downstream Boundary
SW5 - Upstream Boundary


Surface Water Sites - Iron (Total)
Quorrobolong Creek and Coney Creek
mg/L
18
16
14
12
10
8
6
4
2
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek


Surface Water Sites - TSS
CHPP and Bellbird Creek
mg/L
14
12
10
8
6
4
2
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW1 - Emergency Dam Spillway
SW6 - WTP Discharge
EPL Criteria


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


Surface Water Sites - TSS
Quorrobolong Creek and Coney Creek
mg/L
400
350
300
250
200
150
100
50
0
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
SW Q1 - Quorrobolong Creek (Sandy Creek Rd)
SW Q2 - Quorrobolong Creek Upstream
SW Q3 - Quorrobolong Creek Downstream
SW C1 - Cony Creek

Ms Julie McNaughton
Environment & Community Coordinator
Austar Coal Mine Pty Ltd

By Email ONLY: julie.mcnaughton@yancoal.com.au
CC: carly.mccormack@yancoal.com.au

25/11/2020

Dear Ms McNaughton

Austar Coal Mine (DA 29/95 and MP08_0111)
Annual Review 2019/2020

Reference is made to the Annual Review for the period 1 July 2019 to 30 June 2020, submitted to the Department of Planning, Industry and Environment (the Department) on 30 September as required under Schedule 5 condition 5 of DA 29/95, as modified and Schedule 7 condition 3 of MP08_0111, as modified.

The Department has reviewed the Annual Review and considers it to satisfy the reporting requirements of app29/95, as modified, MP08_0111, as modified and the Department's *Annual Review Guideline* (October 2015).

Please note that the Department's acceptance of this Annual Review is not endorsement of the compliance status of the project.

Please make publicly available a copy of the 2019/2020 Annual Review on the company website.

Should you need to discuss the above, please contact Ann Hagerthy, Senior Compliance Officer, on 02 6575 3407 or email compliance@planning.nsw.gov.au

Yours sincerely

Heidi Watters
Team Leader Northern
Compliance

As nominee of the Planning Secretary