YANCOAL
兖煤澳大利亚有限公司

AUSTAR COAL MINE
PART OF THE YANCOAL AUSTRALIA GROUP

Annual Environmental Management Report

July 2015 – June 2016

Name of operation	Austar Coal Mine
Name of operator	Yancoal Mining Services Pty Ltd
Development consent / project approval #	Refer Table 1.2
Name of holder of development consent / project approval	Austar Coal Mine Pty Ltd
Mining lease #	Refer to Table 1.4
Name of holder of mining lease	Austar Coal Mine Pty Ltd
Water licence #	Refer Table 1.5
Name of holder of water licence	Austar Coal Mine Pty Ltd
MOP start date	**MOP 1**: May 2008, **MOP 2:** June 2016
MOP end date	**MOP 1**: Nov 2016, **MOP 2:** Nov 2022
AEMR / Annual Review start date	1 July 2015
AEMR / Annual Review end date	30 June 2016

I, Gary Mulhearn, certify that this audit report is a true and accurate record of the compliance status of Austar Coal Mine for the period 1 July 2015 to 30 June 2016 and that I am authorised to make this statement on behalf of Austar Coal Mine Pty Ltd.

Note.

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

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

Name of authorised reporting officer	Gary Mulhearn
Title of authorised reporting officer	Environment and Community Manager
Signature of authorised reporting officer	
Date	30 September 2016

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1 INTRODUCTION

1.1 Scope

This Annual Environmental Management Report (AEMR) covers the twelve month reporting period from 1 July 2015 to 30 June 2016. Austar Coal Mine Pty Limited (Austar) is required to prepare and submit an AEMR in accordance with the Department of Industry, Resources and Energy Division's *Environmental Guidelines for Industry – The Annual Environmental Management Report Version 3, January 2006*. The preparation of this AEMR, also satisfies the Annual Reporting and Annual Review 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.

Table 1-1 displays each annual reporting requirement of both DA 29/95 and PA 08_0111 and where these requirements are addressed within the AEMR.

The purpose of the AEMR is to provide a summary of mining and coal handling activities, and environmental and community performance for Austar undertaken during the reporting period. This report outlines:

- details of mining and coal handling activities;
- environmental monitoring activities and results;
- compliance with statutory provisions;
- community relations;
- rehabilitation; and
- proposed mining activities for next reporting period.

1.2 Background

Austar is an aggregate of the former Pelton, Ellalong, Cessnock No.1 (Kalingo) Colliery and Bellbird South Collieries. Austar is owned by Yancoal Australia Limited (Yancoal). Austar is located on Middle Road, Paxton, NSW (**Figure 1.1** and **Plan 1A**).

Underground mining commenced in 1916 at Pelton Colliery and continued until 1992. Kalingo Colliery began as an underground mine in 1921 and ceased operations in 1961. In the late 1960's the Kalingo Colliery was amalgamated into the Pelton Colliery. Longwall production commenced at the Pelton Colliery in 1983 and continued until the mine, then known as Ellalong Colliery, was closed in May 1998 by Oakbridge. Southland Coal then acquired the assets of Ellalong and Pelton Collieries and amalgamated those with Bellbird South, which was also owned by Southland Coal.

Southland Coal developed a longwall operation that mined the substantial Bellbird South coal reserves utilising the existing Ellalong facilities and infrastructure.

In December 2003, spontaneous combustion in longwall panel SL4 resulted in Southland Coal ceasing mining activities. The site of the underground fire was sealed and the mine was placed on a 'care and maintenance' program for 18 months. Yancoal purchased the mine in December 2004 and changed the name to Austar Coal Mine.

Yancoal introduced an enhanced form of the conventional retreat longwall system to the Australian Coal Mining Industry at the Austar Coal Mine in 2006 called Longwall Top Coal Caving (LTCC). To allow for the introduction of LTCC to Austar Stage 1 panels A1 and A2 in the Bellbird South area, a modification to DA 29/95 under section 96(2) of the *Environmental Planning and Assessment Act 1979* was sought in 2006. The Minister for Planning approved the modification which permitted the extraction of up to 6.5 metres of coal in panels A1 and A2. In 2008, consent was granted for extraction in panels A3, A4 and A5 under a second modification, and for slightly longer and wider panels in A4 and A5 under a subsequent modification. In December 2010 approval was granted for extraction of additional longwall panel A5a in the Stage 2 area, and a modification to lengthen panel A5a was granted on 27 April 2012.

Approval for Stage 3 operations (PA 08_0111) was granted on 6 September 2009 by the Minister for Planning. A minor administrative modification was granted on 4 May 2010, and a modification to allow reorientation of Stage 3 longwall panels was granted by the Minister for Planning and Infrastructure on 13 March 2012. A further modification to allow extension of longwall panels A7 to A10 to the west by between 100m and 300m was granted under delegated authority of the Minister for Planning and Infrastructure on 17 December 2013.

The Stage 3 Project (as modified) involves mining of known coal resources within areas of Consolidated Mining Lease 2 (CML2) and Mining Leases ML1661 and ML1666.

The Stage 3 Project (as modified) consists of:

- Extension of underground mining from Stage 1 and Stage 2 Bellbird South operations into the area described as Stage 3 of the Austar Mine. Coal will be extracted from the Greta Coal Seam at depths of 450 to 740 metres using Longwall Top Coal Caving (LTCC) methods. A total of approximately 45.3 million tonnes (Mt) of coal will be produced from longwall panels A7 to A19 over a 21 year mine life. This will involve extraction of up to 3.6 Mt of Run of Mine (ROM) coal per year.
- Construction and operation of a new Surface Infrastructure Site off Quorrobolong Road south of Kitchener. This site will include an access road, upcast and downcast ventilation shafts, main ventilation fan, bathhouse, workshop, electricity substation and distribution line, service boreholes, offices and store. The Surface Infrastructure Site will be used to provide ventilation to the mine and to provide access to the Stage 3 underground workings for men and materials. No coal will be brought to the surface at this site.
- Continued use of Austar's existing water management, coal transport systems, coal preparation plant and rejects emplacement areas.

Mining in the second Stage 3 panel (Longwall A8) commenced on 16 June 2014 and was completed on 24 June 2015. Austar made a business decision to relocate development operations to the Bellbird South and Ellalong Colliery areas in 2015. However, the Stage 3 Project remains central to the long term future of Austar Coal Mine and the aim is to return to mining in the Stage 3 area in the medium term, with mining in this area approved until 2030.

Mining within the Bellbird South and Ellalong Colliery recommenced in June 2015 with development of first workings of existing approved coal reserves to allow future extraction of longwall panels LWB1 to LWB3 (refer to **Figure 1.1** and **Plan 1C**.). A modification to DA 29/95 extending the area and life of the consent and permitting transfer and processing of coal from panels LWB1 to LWB3 was approved under delegation of the Minister for Planning on 29 January 2016. The modified consent contemporised subsidence management conditions requiring an approved Extraction Plan to be in place prior to longwall extraction of panels LWB1 to LWB3.

The approved Mining Operations Plan (MOP) in place at the start of this AEMR period, covered the period June 2015 to November 2015. During the AEMR period Austar prepared a new MOP for the period November 2015 to November 2022, which was endorsed by DRE on 27 November 2015. A further new MOP was submitted in June 2016, in response to the modification approval to DA29/95, which covers the period June 2016 to June 2023. The new MOP identifies that mining will continue within existing approved coal reserves of the Bellbird South and Ellalong Colliery areas to allow future extraction of longwall panels prior to returning to the Stage 3 area. Within the Bellbird South and Ellalong Colliery areas:

- Mining leases are currently held (CML2 and CCL728);
- Development first workings are permissible under existing consent (DA29/95 and DA74/75/79);
- An Extraction Plan was prepared during the AEMR period for longwall panels LWB1 to LWB3; and
- A further modification application to DA29/95 will be prepared for panels LWB4 to LWB7 during the next reporting period to extend the extraction plan requirements to those panels.

The location of approved operations is shown in **Figure 1.1** and **Plan 1C**.

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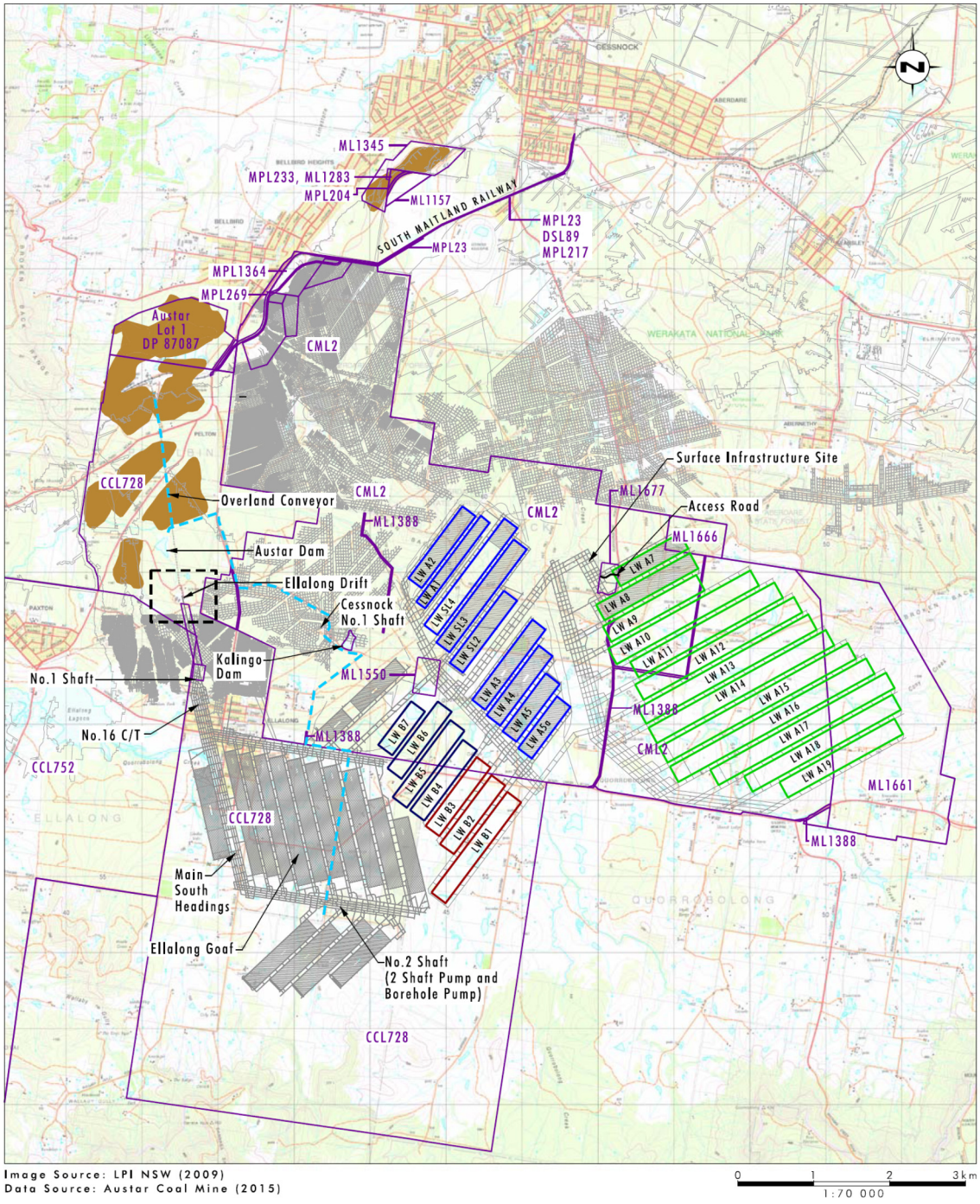


FIGURE 1.1 LOCALITY PLAN AND APPROVED MINING OPERATIONS

TABLE 1-1 ANNUAL REPORTING REQUIREMENTS

DA No. 29/95	Section of the AEMR
Schedule 5	
Annual Reporting 5. By the end of September each year, unless the Secretary agrees otherwise, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:	This AEMR
(a) describe the development (including any rehabilitation) that was carried out in the previous year to 30 June, and the development that is proposed to be carried out over the current year to 30 June;	Section 2 & 5
(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous year to 30 June, which includes a comparison of these results against the: • relevant statutory requirements, limits or performance measures/criteria; • monitoring results of previous years; and • relevant predictions in the EIS and EA (MOD 5) and EA (MOD 6);	Sections 3 & 4
(c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;	Section 3
(d) identify any trends in the monitoring data over the life of the development;	Section 3
(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	Section 3
(f) describe what measures will be implemented over the next year to improve the environmental performance of the development.	Section 6
PA 08_0111	**Section of the AEMR**
Schedule 7	
Annual Review 3. Each year, the Proponent shall review the environmental performance of the mine complex to the satisfaction of the Director-General. This review must:	This AEMR
(a) describe the works that were carried out in the past year, and the works that are proposed to be carried out over the next year;	Sections 2, 5 & 6
(b) include a comprehensive review of the monitoring results and complaints records of the mine complex over the past year, which includes a comparison of these results against the • the relevant statutory requirements, limits or performance measures/criteria; • the monitoring results of previous years; and • the relevant predictions in the EA and Extraction Plan;	Sections 3 & 4
(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;	Section 3
(d) identify any trends in the monitoring data over the life of the mine complex;	Section 3
(e) identify any discrepancies between the predicted and actual impacts of the mine complex, and analyse the potential cause of any significant discrepancies; and	Section 3
(f) describe what measure will be implemented over the next year to improve the environmental performance of the mine complex.	Section 6

1.3 Consents, Leases and Licences

1.3.1 Development Approvals and Consents Held by Austar Coal Mine

A summary of development approvals and consents held by Austar is outlined in **Table 1-2**.

TABLE 1-2 DEVELOPMENT APPROVALS AND CONSENTS

Consent Description	Date	Approval Authority	Approved Development
DA 74/75/79	4 December 1975	Cessnock City Council (CCC)	Development Consent for a coal mine at Ellalong. • 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 of the Pelton CHPP for the washing and handling of coal. • Water management systems. • Upgrade of the Pelton rail loading facility and railway spur. • Reject emplacement underground, company owned land, open cut areas adjoining Pelton and other abandoned mine sites.
DA 118/680/93	8 October 1980	CCC	Downcast Ventilation Shaft and Man Access Shaft, Bathhouse and Offices at Ellalong Colliery.
DA 118/691/181	26 Nov 1992	CCC	Pelton Open Cut Coal Mine. • Approval of an open cut coal mine adjoining Pelton Colliery up to 300,000 t of coal and underground mining of approximately 27,000 t of coal from a section of prior workings south of the proposed open cut.
DA 118/691/181 (modification)	11 January 1993	CCC	Pelton Open Cut Coal Mine – Modification. • Extension of open cut mining area. • Infrastructure and water management modifications.

Consent Description	Date	Approval Authority	Approved Development
DA 118/691/229	7 Jan 1993	CCC	Pelton Coal Handling Preparation Plant – Raw Coal Handling Facility, Washed Coal Facility and Upgrading 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	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 June 1994	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 July 1994	CCC	Relocatable Office and Temporary Bathhouse at Pelton Colliery.
DA 118/695/22	12 July 1995	CCC	Establishment of Overburden Stockpile at Pelton Colliery. • Establishment of an overburden stockpile for the Pelton Open Cut Operations.
DA 118/695/81	12 July 1995	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	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	CCC	Compressor and Pump Enclosure Buildings at Ellalong Colliery.
DA 118/695/18	21 Feb 1995	CCC	Re-locatable Office at Pelton Colliery.

Consent Description	Date	Approval Authority	Approved Development
DA 29/95	14 Feb 1996	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 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.
DA 29/95 (modifications)	27 Sep 2006 (MOD 1) 8 Jun 2008 (MOD 2) 28 May 2009 (MOD 3) 7 Dec 2010 (MOD 4) 27 April 2012 (MOD 5) 29 Jan 2016 (MOD 6)	Minister for Planning (or delegate)	Extension of Underground Mining Activities into Bellbird South (Ellalong Colliery) – Modifications. • Use of longwall top coal caving (LTCC) mining methods in longwall panels (A1 to A5). • 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 m^3 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) using LTCC • Extension of LTCC Longwall Panel A5a

Consent Description	Date	Approval Authority	Approved Development
			• Extension to Bellbird South development consent area to include Longwall Panels LWB1 to LWB3 • Extension of consented activities to 14 Feb 2022.
Project Approval 08_0111	6 Sep 2009	Minister For Planning	Stage 3 Expansion Project - extension to longwall mining to an area east of existing operations. Key features: • Longwall production from the Greta coal seam from panels A6 to A17 using longwall Top Coal Caving (LTCC) technology • 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 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 (MOD 3)	Delegate for Minister for Planning Delegate for Minister for Planning	• Minor change to wording regarding subsidence impact performance measures to built features in Table 1 of approval. The key performance indicator 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 longwalls A7 to A10 to the west by approximately 100m and 300m

Consent Description	Date	Approval Authority	Approved Development
DA 8/2012/503/1	19 Dec 2012	CCC	• Extension of car parking area associated with Austar Coal Mine

1.3.2 Subsidence Management Plan / Extraction Plan

Austar holds an approved Subsidence Management Plan (SMP) for longwall panels A3 to A5a in Stage 2 and a combined SMP / Extraction Plan for longwall panels A7 to A10 in Stage 3. The combined SMP / Extraction Plan was prepared to satisfy both the conditions of the Mining Leases in relation to SMP, and also the conditions of PA08_0111 in relation to the Extraction Plan.

The SMP approval for the Stage 2 LWA5a extension was granted on 7 May 2012 by the Department of Industry – Division of Resources and Energy (DI-DRE). Conditions of approval were the same as those issued for LW A5a. The SMP includes the monitoring and management strategies for environmental impacts associated with subsidence from the extraction of longwall A5a.

The combined SMP / Extraction Plan for Stage 3 longwalls A7 to A10 was granted Extraction Plan approval by the Department of Planning and Environment (DPE) on 30 May 2013, and was granted SMP approval on 3 June 2013 by DI-DRE. The SMP / Extraction Plan includes the monitoring and management of environmental impacts associated with subsidence from the extraction of longwalls A7 to A10.

The Stage 3 first workings were varied to retract the commencing end of LWA8 to LWA9 with approval of the DPE in November 2013 and December 2013 in response to further geological information on the location of a dyke structure.

A variation to the Extraction Plan / SMP for longwalls A7 to A10 to address the extension of LWA7 to LWA10 to the west by approximately 100m to 300m and the retraction of LWA8 commencing end was approved by DPE on 6 January 2014, and was granted SMP approval on 7 January 2014 by DI-DRE. A variation to the SMP was approved by DI-DRE on 19 February 2014 to reflect the change to first workings by retracting the commencing end of LWA9, short of the dyke structure, this will be followed by a variation to the Extraction Plan prior to extraction of longwall A9.

An Extraction Plan for LWB1 to LWB3 was submitted during the AEMR period in consultation with the relevant government agencies, and was pending approval prior the end of the AEMR period.

A summary of Extraction Plan / SMP approvals for Bellbird South (Stage 2, LWB1-LWB3) and Stage 3 mining areas held by Austar is outlined in **Table 1-3**.

TABLE 1-3 SUBSIDENCE MANAGEMENT PLAN / EXTRACTION PLAN APPROVALS

Consent Description	Date	Approval Authority	Approval Summary
SMP Approval 06/7775	30 Jan 2009	DI-DRE	Subsidence Management Plan approval for Austar Colliery Longwall A3 only
SMP Approval 08/2956	24 Dec 2009	DI-DRE	Subsidence Management Plan approval for Austar Colliery Longwalls A4-A5
SMP Approval 10/22	27 April 2011	DI-DRE	Subsidence Management Plan approval for Austar Colliery Longwall A5a
SMP Approval 10/22	7 May 2012	DI-DRE	Subsidence Management Plan approval for Austar Colliery Longwall A5a extension. Conditions of approval are the same as those issued for Longwall A5a.
Extraction Plan Approval	30 May 2013	DPE	Extraction Plan approval for Austar Coal Mine Longwalls A7 to A10
SMP Approval 13/1876	3 June 2013	DI-DRE	Subsidence Management Plan approval for Austar Coal Mine Longwalls A7 to A10.
Extraction Plan Approval	6 January 2014	DPE	Extraction Plan approval for Austar Coal Mine Longwalls A7 to A10 to correspond to PA08_0111 MOD3 and retraction to LWA8 commencing end
SMP Variation Approval 13/1876	7 January 2014	DI-DRE	Subsidence Management Plan approval for Austar Coal Mine Longwalls A7 to A10 to correspond to PA08_0111 MOD and retraction to LWA8 commencing end
SMP Variation Approval 13/1876	19 February 2014	DI-DRE	Subsidence Management Plan approval for retraction to LWA9 commencing end
Extraction Plan LWB1 to LWB3	Application submitted	DPE	Extraction Plan for Bellbird South Longwalls B1 to B3 was pending approval at end of AEMR period.

1.3.3 Mining Leases

Details of the relevant mining leases are summarized in **Table 1-4**.

TABLE 1-4 MINING LEASES

Mining Title (Act)	Date Granted	Expiry Date	Area (Ha)	Surface	Depth Restriction
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 (subsurface)	7.62 to 15.24 metres
Mining Purposes Lease No. 23 (1906)	17/05/1909	17/05/2030	2.421	Yes	Surface to 15.24 metres

Mining Title (Act)	Date Granted	Expiry Date	Area (Ha)	Surface	Depth Restriction
Mining Purposes Lease No. 204 (1906)	03/02/1916	03/02/2018	1.2	Yes	Surface to 15.24 metres
Mining Purposes Lease No. 217 (1906)	12/04/1916	12/04/2018	0.6298	Yes	Surface to 15.24 metres
Mining Purposes Lease No. 233 (1906)	01/08/1916	01/08/2016	1.973	Yes	Surface to 7.62 metres
Mining Purposes Lease No. 269 (1906)	07/12/1917	07/12/2018	2.79	Yes	Surface to 6.1 metres below the level of the rails when laid
Mining Purposes Lease No. 1364 (1906)	28/10/1968	28/10/2029	0.4527	Yes	Surface to 15.24 metres
Consolidated Coal Lease No. 728 (1973)	10/10/1989	30/12/2023	3296.8	Various	Various
Consolidated Coal Lease No. 752 (1973)	23/05/1990	30/12/2023	3802	No (subsurface)	Various
Consolidated Mining Lease No. 2 (1992)	24/03/1993	15/05/2025	3388	Various	Various
Mining Lease No. 1345 (1992)	23/03/1995	30/12/2023	41.895	Yes	Surface to 900 metres
Mining Lease No. 1388 (1992)	02/04/1996	02/04/2017	15.12	No (subsurface)	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 (subsurface)	20 to 900 metres
Mining Lease No. 1666 (1992)	25/01/2012	25/01/2033	34.13	No (subsurface)	30.48 to 900 metres
Mining Lease No. 1677 (1992)	23/08/2012	23/08/2033	9.16	Yes	Surface to 30.48 metres

1.3.4 Environment Protection Licence

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

1.3.5 Water Licences

Austar currently holds water licences for a number of monitoring and dewatering bores across the operation. Austar's current water licences issued under Part 5 of the *Water Act 1912* are provided in **Table 1-5**. (Note from 1 July 2016 Austar's dewatering bore licences [BL20171481, BL203349 and BL203350] will be regulated under the *Water Management Act 2000* and will be replaced by a Water Access Licence in due course).

TABLE 1-5 WATER LICENCES

Licence Held	Licence Number	Validity of Licence	Purpose of Licence	Extraction Limit
Bore Licence Certificate	20BL171481	17 Aug 2012 – 16 Aug 2017	Dewatering (groundwater) (No 2 Shaft Borehole Pump)	20BL171481, 20BL173349 and 20BL173350 have a combined extraction limit of 770ML in any 12 month period commencing 1 July.
Bore Licence Certificate	20BL173349	01 Nov 2012 – 31 Oct 2017	Mining (16CT pump station)	
Bore Licence Certificate	20BL173350	01 Nov 2012 – 31 Oct 2017	Dewatering (groundwater) (No 2 Shaft Pump)	
Bore Licence Certificate	20BL171361	17 May 2007 - Perpetuity	Monitoring Bore (AQD1077)	N/A
Bore Licence Certificate	20BL172524	20 Jul 2010 - Perpetuity	Monitoring Bore (NER1010)	N/A
Bore Licence Certificate	20BL172852	7 Jun 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
Bore Licence Certificate	20BL173891	19 Mar 2015 - Perpetuity	Monitoring Bore (MB02)	N/A

1.3.6 Mining Operations Plan (MOP)

In accordance with the Mining Act 1992, Austar conduct operations in accordance with a Mining Operations Plan (MOP). An amendment to the Mining Operations Plan 2008-2015 was approved on 29 May 2015 with an approved MOP period June 2015 to November 2015. The approval of this amendment allowed a transition between the previous EDG03 MOP Guidelines and the new ESG3 MOP Guidelines (September 2013), and inclusion of further details on mining in the Bellbird South area.

During the AEMR period Austar prepared a new MOP for the period November 2015 to November 2022, which was endorsed by DRE on 27 November 2015. The approved MOP covers underground mining, coal handling and other associated activities. All mining activities at Austar were carried out generally in accordance with the approved MOP during the reporting period.

A new MOP was submitted in June 2016, in response to the modification approval to DA29/95 in January 2016. The new MOP covers the period June 2016 to June 2023. The new MOP identifies that mining will continue within existing approved coal reserves of the Bellbird South and Ellalong Colliery areas to allow future extraction of longwall panels prior to returning to the Stage 3 area. The new MOP was under consideration of DRE at the end of the AEMR period.

1.3.7 Environmental Management Plans

In accordance with DA No.29/95 and PA08_0111, Austar have developed and implemented a range of environmental management plans. **Table 1-6** outlines the environmental management plans currently required by each relevant development consent, the determining authority and their approval status.

TABLE 1-6 ENVIRONMENTAL MANAGEMENT PLANS

Plan	DA Requirement	Approval Authority	Approval Date
Environmental Management Strategy, May 2013	DA29/95 – Schedule 5 Condition 1 PA08_0111 - Schedule 7 Condition 1	DPE	2 October 2013
Environmental Monitoring Program, May 2013	DA29/95 – Schedule 5 Condition 2 PA08_0111 - Schedule 7 Condition 1	DPE	2 October 2013
Shaft Construction Environmental Management Plan, June 2012	PA08_0111 – Schedule 4 Condition 1, 2, 8	DPE	15 June 2012
Landscape Management Plan – Kitchener SIS, June 2013	PA08_0111 – Schedule 6 Condition 4	DPE	22 July 2013
Site Water Management Plan, April 2013	DA29/95 – Schedule 3 Condition 6-11 PA08_0111 – Schedule 4 Condition 9	DPE	17 May 2013
Noise and Vibration Management Plan, July 2013	DA29/95 – Schedule 3 Condition 13-16 PA08_0111 – Schedule 4 Condition 2-3	DPE	2 August 2013
Air Quality and Greenhouse Gas Management Plan, June 2013	DA29/95 – Schedule 3 Condition 17-20 PA08_0111 – Schedule 4 Condition 6-7	DPE	26 June 2013
Aboriginal Cultural Heritage Management Plan, May 2013 & Addendum October 2013.	PA08_0111 – Schedule 3 Condition 4 and Schedule 4 Condition 10	DPE	30 May 2013 & 6 January 2014
Historic Heritage Management Plan, January 2014	PA08_0111 – Schedule 4 Condition 11	DPE	19 February 2014
Surface Infrastructure Site Traffic Management Plan, December 2009	PA08_0111 – Schedule 4 Condition 1 Statement of Commitments 1.12.1	Cessnock City Council	22 December 2009
Austar Coal Mine Longwalls A7 to A10 Extraction Plan, December 2013	PA08_0111 – Schedule 3 Condition 4-5	DPE	6 January 2014

Environmental management plans are available from the Austar website (**www.austarcoalmine.com.au**).

1.4 Mine Contacts

Table 1-7 outlines the contact details for site personnel responsible for mining, coal preparation, rehabilitation, environmental and community liaison at Austar.

TABLE 1-7 SITE PERSONNEL

Position	Name	Company	Contact Number
Mine Operations Manager	Brian Wesley	Austar Coal Mine	(02) 4993 7356
CHPP Manager	Paul Davis	Austar Coal Mine	(02) 4993 7501
Environment & Community Manager	Gary Mulhearn	Austar Coal Mine	(02) 4993 7334
Environment & Community Coordinator	Josh Chadwick	Austar Coal Mine	(02) 4993 7363

1.5 Actions Required at Previous AEMR Review

DPE noted receipt of the 2014-2015 AEMR after it's submission. No further formal response was received from DPE that required actions.

DI-DRE reviewed the 2014-2015 AEMR and conducted an inspection on 15 March 2016. No formal response was provided after the inspection. At the close out meeting at the end of the inspection several issues were identified where improvements could be made, this information is presented in **Table 1-8**.

TABLE 1-8 ISSUES/ACTIONS FROM DI-DRE SITE INSPECTION

Item	Issue / Action	Addressed
Pit Top Area		
Issue 1	Oil staining was observed on the outside wall of the bund of the diesel service bay. This appeared to be due to the fitment of sheeting at top of the bund wall.	Austar identified that laserlite sheeting fitted at top of the concrete bund allowed washdown water within the bunded area to splash onto the sheeting, then run to the top, then down the outside of the bund wall. This was addressed by fitting an additional laserlite sheet on the inside of the bund wall so that washdown water splashed into the bund area.
Issue 2	Oil filled gearbox was observed to be leaking onto an earthen floor under cover in a laydown area. Potential for contamination.	A bund was installed on an adjacent concrete floored covered area. It is intended that oil filled equipment in the laydown area be stored in concrete bund area to minimise risk of contamination from oil filled equipment.

Item	Issue / Action	Addressed
Kitchener Surface Infrastructure Site (SIS)		
Issue 3	Clean water diversion drain was observed to be affected by scour due to deterioration of geofabric lining with potential to generate sediment from the drain.	Austar has sought proposals to maintain the clean water diversion drain during the AEMR period. This works will be completed during the 2016-2017 period.
Issue 4	Some weeds were observed at Kitchener SIS in some areas.	Weed maintenance activities were undertaken by hand on embankments during the AEMR period. Further weed management activities are ongoing as required.
Pelton CHPP		
Issue 5	Bioremediation area – investigate pathway for correct disposal.	Soil currently remains in the Bioremediation area. Disposal path will be discussed with regulators prior to moving.
Issue 6	Used polypipe and fittings were observed to be stored in the East Pit. Audit and dispose of items not required.	Polypipe in the east pit has been recovered and used during the AEMR period as a recycling method.

2 Operations During The Reporting Period

2.1 Exploration

Two exploration drilling boreholes and one seismic survey was completed during the 2015-2016 reporting period within Exploration Licence EL6598 (Refer to **Plan 3A**). In each case the relevant exploration activity approval was sought and granted from DI-DRE prior to commencement. The exploration boreholes were fully grouted and the sites rehabilitated at completion of drilling activities.

During the 2016-2017 reporting period it is planned to undertake further exploration boreholes and seismic line survey.

2.2 Land Preparation

No land preparation was required during the 2015-2016 reporting period.

2.3 Construction

There were no construction activities carried out at Austar during the 2015-2016 reporting period.

2.4 Mining

2.4.1 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

Stage 3 Operations
Mining in the second Stage 3 panel (Longwall A8) was completed 24 June 2015, immediately prior to the reporting period. No mining was completed in the Stage 3 area during the reporting period.

Bellbird South Area
Development mining operations were undertaken in the Bellbird South area to support future longwall mining in this area during the 2015-2016 reporting period. At the end of the reporting period, the longwall was being installed at the commencing end of longwall B2, however, no longwall mining was undertaken in the AEMR period. Longwall extraction of longwall B2 is proposed to commence in the 2016-2017 reporting period.

Management of the other key mine hazards of ventilation, spontaneous combustion and water have been effective in that no major incidents have occurred underground during the 2015-2016 reporting period.

Mining undertaken in the 2015-2016 reporting period, and planned for the next reporting period is presented in **Plan 3A**.

2.4.2 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 2-1 provides a summary of coal production and waste generation for the 2015-2016 reporting period.

TABLE 2-1 PRODUCTION AND WASTE SUMMARY

	Cumulative Production			
	Unit	2014-2015 Reporting Period	2015-2016 Reporting Period	2016-2017 Reporting Period (Prediction)
Topsoil stripped	T	0	0	0
Topsoil used/spread	T	3,407	0	0
Processing waste				
Fine Tailings	m^3	354,600	83,300	300,000
Coarse Reject	T	188,197	7,130	25,800
ROM Coal Mined				
- **Development**	T	31,100	272,019	180,012
- **Longwall**	T	2,066,095	0	1,803,613
Total ROM	T	2,097,195	272,019	1,983,625
Product Coal	T	1,681,841	258,236	1,785,263

The provisional mine production in the AEMR for the 2015-2016 reporting period estimated approximately 0.22 Mt ROM coal mined and approximately 0.20 Mt product coal produced based on purely development mining operations. Coal production at Austar during the reporting period was slightly higher than predicted due to good development mining progress. Total ROM mined in the 2015-2016 reporting period was within approved production limits of PA 08_0111. Forecast production in the 2016-2017 period will be from longwall panels in the Bellbird South mining area.

2.5 Mineral Processing

All ROM coal from the underground is transferred by conveyors via the Ellalong Drift to a 2000 tonne bin at Pit Top, where an overland conveyor system with a nominal capacity of 750 tonnes per hour conveyors the coal to the Pelton CHPP raw coal stockpile. The majority of product coal processed at the CHPP is railed to the Port of Newcastle via the Austar Rail Line, the South Maitland Railway and the Main Northern Rail Line.

The CHPP is a heavy medium (HM) plant. There are three circuits that treat different fractions:

- No.1 HM circuit treats the -10mm x 1mm coal;
- No.2 HM circuit treats the - 40mm x 10mm coal; and
- Fines circuit treats the -1mm fraction (spirals and Classifying cyclones).

Coal enters the plant passing over a set of sizing screens.

The +40mm material reports to the plant MMD sizer, where it is sized to -38mm. The -38mm +0mm material then reports to the No.2 heavy medium circuit. The -10 x 1mm material is fed over the desliming screens and to the No.1 heavy medium circuit. The -1mm fraction is fed to the fines circuit.

2.6 Waste (Coal Reject) Management

2.6.1 Chemical/Physical Characteristics of Reject

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 to leave the site with emplacement areas designed to drain to old mine workings.

2.6.2 Coarse Reject Material

In accordance with the MOP, coarse reject emplacement was undertaken at the following sites during the 2015-2016 reporting period.

Aberdare Extended Open Cut Void (Aberdare Extended)
The Aberdare Extended Open Cut area is the primary reject emplacement area utilised by Austar during the approved MOP term. Rejects are hauled by truck along a private haul road from the CHPP to the emplacement area.

It is planned that following the emplacement of rejects, the area will be rehabilitated to a final landform that has been agreed with the private landowner of the property. The area will be progressively rehabilitated during the MOP term. Once Aberdare Extended Emplacement Area has reached its maximum capacity, the voids on the CHPP site will become the primary Austar coal reject emplacement areas.

The Aberdare Extended Emplacement Area is situated in close proximity to neighbouring residences, as near as 40 metres, with a significant number of residences within 300 metres of the emplacement area. A consultation program was implemented prior to resuming use in 2009, and an update on progress and consultation was undertaken prior to recommencing night emplacement in June 2013.

East Open Cut Void (East Open Cut)
The East Open Cut is a small void on the CHPP site covering an area of approximately 15 hectares. Previously the remaining void has been used as an emergency emplacement area when dumping at

the Aberdare Extended area was unavailable due to heavy rain. Since the mine recommenced in June 2005, coarse reject has been emplaced in the East Open Cut void.

It is intended that in the future until the Aberdare Extended reject emplacement area is complete, the East Open Cut reject emplacement area will be primarily utilised at times when the Aberdare Extended Emplacement Area is not available. Once the Aberdare Extended emplacement area has reached its maximum capacity, the East Open Cut will become the primary emplacement area for Austar.

West Open Cut Emplacement Area (West Open Cut)

The West Open Cut area has been utilised as a clean material overburden emplacement area during previous open cut operations at the site. This area provides a source of inert capping material, which will be utilised as part of the rehabilitation of reject emplacement areas. After removal of the clean overburden for capping purposes at Aberdare Extended and East Open Cut emplacement areas, it is planned to use the resultant void at the West Open Cut for ongoing reject emplacement.

2.6.3 Tailings Disposal

The fine rejects, known as tailings, flow from the CHPP and are discharged into the old Pelton underground mine workings. The return water from these tailings gravitates through the old mine workings and is recovered by dewatering pumps back into Austar's contaminated water management system for treatment and reused in the CHPP or discharged off-site under Austar's EPL license. Additional tailings boreholes are proposed to be installed in 2016-2017 and subsequent reporting periods in accordance with the Mining Operations Plan. The proposed tailings boreholes are shown on **Plan 3D**.

2.7 Waste Management

Waste management at Austar is undertaken using licensed waste contractors (Transpacific Industries, Sell & Parker, JR Richards and Close the Loop®) to collect and dispose of waste from the Austar site on a regular basis. Austar will continue to work with external waste contractors and mine site personnel to implement a total waste management system.

There was a shift from Transpacific Industries Group to JR Richards in November of 2015 so categories reported are a combination of both waste management reports. These reports summarise the amount of waste produced at Austar across the different waste streams (see **Table 2-2**). The waste reports also allow Austar to determine whether contamination between waste streams has occurred on a month by month basis when reported. Any issues and further information regarding cross contamination of the various waste streams can be delivered to employees and contractors through tool box talks and inductions.

Scrap metal and printer cartridges are recycled separately.

TABLE 2-2 WASTE MANAGEMENT DATA FOR THE 2015-2016 REPORTING PERIOD (TONNES)

	Paper & Cardboard	General Waste	Oily Filters	Oily Water	Waste Oil	Fluorescent Tubes	Timber	Medical & Sanitary	Oily Rags	Mixed Solid Waste
TOTAL	6.27	130.8	0.31	24.18	15.20	0.02	12.4	0.19	0.16	252.29

Sell & Parker collected scrap metal recycling at Austar Coal Mine until March when JR Richards took over. Metals are sorted into categories and measured by weight recovered. Metals collected in the 2015-2016 reporting period are documented in **Table 2-3**.

TABLE 2-3 SCRAP METAL DATA FOR THE 2015-2016 REPORTING PERIOD

Metal	Total Weight (Tonnes)
Black Iron (Sell and Parker)	60.22
Mixed Scrap (Sell and Parker)	3.32
No Value (Sell and Parker)	2.22
Ni Hard (Sell and Parker)	2.00
Scrap Steel (JR Richards)	82.34
TOTAL	**150.1**

Close the Loop® collect and recycle printer cartridges from site. Cartridges collected in the 2015-2016 reporting period are documented in **Table 2-4**.

TABLE 2-4 PRINTER CARTRIDGES COLLECTED FOR THE 2015-2016 REPORTING PERIOD

Printer Cartridges	Total Weight (Kilograms)
Cartridge	20.10
Other	30.18
Total Diverted from landfill	**50.28**

2.7.1 Hydrocarbon Management

All necessary measures are taken to ensure that operations at the colliery are conducted in a responsible manner, minimising the risk of pollution to the environment. Hydrocarbon management systems are designed and installed in accordance with Australian Standards and EPA guidelines.

The CHPP hydrocarbon management systems include a covered oil store on concreted flooring, covered and bunded empty oil drum store, heavy vehicle lubrication service area and an oil evacuation system.

Austar operates a hydrocarbon remediation area at the CHPP to manage hydrocarbon contaminated material retrieved from the site. As shown in **Figure 2.1** the area is signposted and has three bunded cells for segregation of materials of different ages. The bunded area was constructed on a disused

laydown area and is within the sites dirty water catchment. The 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.

FIGURE 2.1 HYDROCARBON REMEDIATION AREA

At the Austar Pit Top site, the hydrocarbon management system includes a covered oil store, an oily water treatment system for the washdown bay and surface runoff, and a covered empty drum draining rack before drums are placed in recycling bins. Longwall fluid (solcenic) is stored in an above ground bunded storage area at the No. 3 shaft infrastructure site.

There is one 55,000L and one 15,000L above ground bulk diesel storage tank at the CHPP and one 58,000L above ground bulk diesel storage tank at the Pit Top. All bulk diesel storage tanks are bunded. Rain water caught on the floor of the bunds drains to a sump which can be emptied by pumps when required. Water pumped from the bund at the Pit Top bulk diesel storage bund enters the washdown pit which in turn flows into the oil water separator.

All hydrocarbon storage areas are equipped with mobile spillage kits.

2.8 ROM and Product Stockpiles

The raw or ROM coal stockpile has a live capacity of 50,000 tonnes, and an overall capacity of 500,000 tonnes. The washed product coal stockpile has a capacity of approximately 350,000 tonnes. All coal stored in excess of the live storage capacity of the system is handled using tracked bulldozers.

2.9 Water Management

2.9.1 Overview

Austar operate under an approved Site Water Management Plan (SWMP). The current approved version of the SWMP incorporating the requirements of the Stage 3 project was prepared in accordance with Condition 9 of Schedule 4 of PA08_0111 and approved by the Director General of the DPE on 17 May 2013.

The factors that influence the site water balance at Austar are complex and variable. There are a number of geographically separated interrelated systems that are managed as a whole to ensure that

the operational needs of the mine are addressed whilst also meeting Environment Protection Licence (EPL) requirements.

There are many large water storage areas, both on the surface and underground, that act as buffers such that individual systems can operate independently of each other.

The water management system at Austar comprises of three (3) major components or systems:

- Underground Mine Water Management System;
- Pelton CHPP Site Water Management System; and,
- Surface Water Storage and Management System.

Water treatment onsite includes pH adjustment, flocculation and settlement of suspended sediments in addition to a reverse osmosis water treatment plant.

With the use of the reverse osmosis water treatment plant, the site operates almost independently of the town potable supply and only discharges treated water to Bellbird Creek in accordance with EPL416 conditions.

2.9.2 Surface Water

Austar's surface water management system has been designed to match the capacity of the underground dewatering systems with additional provision to store and handle surface runoff during heavy rain events.

The main surface water storage facilities are located at the CHPP, Kalingo Dam, Austar Dam and the Kitchener Surface Infrastructure Site. The water storages at Austar are summarised in **Table 2-5**.

TABLE 2-5 STORED WATER

	Volume held		
	Start of reporting period (1 July 2015)	At end of reporting period (30 June 2016)	Storage capacity
Clean water			
Doyle Street Dam	4 ML	5 ML	5 ML
Dirty water			
Precipitate Dam	8 ML	8	8 ML
Process Water Dam	54.6 ML	54.6 ML	70 ML
Number 7 Dam	82 ML	84 ML	100 ML
Water Pollution Control Ponds	0 ML	0	8 ML
Storm Water Retention Dam	0 ML	0	10 ML
Water Pollution Control Dam	2.8 ML	4 ML	40 ML
Emergency Overflow Dam	0 ML	0	40 ML
Kalingo Dam	92.4 ML	94.6 ML	110 ML
Austar Dam	25.6 ML	25.6 ML	35 ML
Kitchener SIS Water Storage Dams	1 ML	1 ML	5 ML
Kitchener SIS Eastern Sediment Basins	0 ML	0	1.6 ML
Controlled discharge water			
SW6 Discharge to Bellbird Creek	0 ML	1 ML	1 ML Tank
Contaminated water			
Not applicable (identified in Dirty water)			

CHPP Water Management System

The CHPP water management system includes a number of surface storage dams. The system has been developed over time and is designed to limit the need for off-site discharges to Bellbird Creek (other than at the treated water discharge point licenced by EPL 416) whilst also maximising the potential for water reuse on-site.

Kalingo Dam

Kalingo Dam has a capacity of approximately 110ML and receives water from old underground workings via No. 2 shaft dewatering pumps via a buried 450mm HDPE pipeline. Kalingo Dam is used as a staging and water storage facility. This dam assists in the removal of iron and manganese via oxidation.

Austar Dam

Austar Dam has a capacity of approximately 35ML and receives water from Kalingo Dam via a buried 315mm HDPE pipeline. It also receives water from an underground pumping station (16 cut through Main South) via a rising main along the drift and surface runoff from the Austar mine pit top.

Kitchener Surface Infrastructure Site

The eastern sediment basin at the Kitchener SIS has a capacity of approximately 1.6ML and receives runoff water from the disturbed areas on the eastern part of the SIS. The water storage dams have a capacity of approximately 5ML and accept water from the western disturbed part of the site. The eastern sediment basin sends water to the water storage dams (or discharges off-site in a greater than design rainfall event), which in turn can pump water to Kalingo Dam.

2.9.3 Underground Mine Water Management

The mine has a complex groundwater management system that is heavily influenced by inflow from surrounding historic mine workings. This system is discussed in detail in the following sections.

Inflow Sources

Inflow water sources into the mine workings can be described as:

- Fairly static natural strata inflow of groundwater;
- Water piped underground used for mining and ancillary underground operations (such as dust control). A large proportion of this water is returned to the surface in the ROM coal;
- Water from high rainfall periods that enter old shallow mine workings via surface cracks etc;
- Coal washery reject water pumped underground into the old shallow mine workings;
- Water from dirty surface water management systems from mining operations, the pit top, and CHPP pumped underground into the old shallow workings; and
- Brine from the Reverse Osmosis water treatment plants pumped underground into the old shallow mine workings.

All major inflow sources have been identified and systems put in place to measure the cumulative volumes. Measurements are generally recorded on a monthly basis and results logged in a database that allows analysis of long term trends and inflows. Water levels are also monitored for the old workings of the neighbouring Bellbird, Kalingo and Aberdare Central Collieries.

Underground Water Storages

The main underground water storages include the following:

- East Pelton;
- West Pelton;
- Ellalong (2 East Panel, Longwalls 1-12);
- Ellalong Longwall 13;
- SL2 Panel; and
- Bellbird/ Aberdare Central.

For more detail, refer to the approved SWMP, available on the Austar website www.austarcoalmine.com.au.

Underground Pumping

There are two (2) underground pumping systems that deliver mine water to the surface water management system, they include:

16 Cut Through (East Pelton and West Pelton)

The 16 c/t Main South Pump Station has been designed and installed to pump mine strata water inflow from the old Pelton (East and West) Mine workings. The main tank has two pumps to pump the water to the surface to Austar Dam via a rising main installed in the drift.

Number 2 Shaft (Ellalong)

The old Ellalong Colliery workings (Longwalls 1 to 12) within Austar mine are utilised as the main underground water storage reservoir for the mine. A large diameter, multistage bore hole pump and additional pumping system installed directly within the Number 2 shaft site pumps water from these underground workings to Kalingo Dam via a vertical rising main and connecting polyethylene pipe line. Mine water may be diverted from this pipeline to Bellbird Colliery.

Groundwater Interception

Austar maintains a comprehensive water inflow database which allows assessments to be made regarding the origin of inflow sources. The recirculation of stored waters, which reside in the up dip old mine workings and percolate through the coal barriers at a relatively constant rate, can be separated from the inflows resulting from the interception of natural groundwater bearing zones due to mining. These natural groundwater bearing zones will typically comprise water held within the Greta seam depressurising into the mine as new workings enter virgin domains and similarly as a result of goaf formation above the longwall panels within the lower sections of the Branxton Formation.

Bore Licence Certificates 20BL171481, 20BL173349 and 20BL173350 have a combined extraction limit of 770ML (approximately 2.1 ML/day) in any 12 month period commencing 1 July.

The amount of groundwater intercepted from monthly flow rates and volumes for the annual licence period are provided in **Table 2-6**.

TABLE 2-6 INCIDENTAL GROUNDWATER INTERCEPTION AT AUSTAR

Month	Groundwater Interception (ML/day)	Monthly Groundwater Interception (ML)
July 2015	0.75	23.32
August 2015	0.33	10.23
September 2015	0.35	10.50
October 2015	0.96	29.88
November 2015	1.00	30.00
December 2015	0.81	25.11
January 2016	0.80	24.80
February 2016	0.80	23.20
March 2016	1.06	32.86
April 2016	0.43	12.90
May 2016	1.41	43.71
June 2016	0.44	13.64
TOTAL		**280.15**

The total incidental groundwater interception of 280.15 ML for the reporting period is within the licensed groundwater interception of 770 ML in any 12 month period. The total incidental groundwater intercepted is slightly less than in the 357 ML recorded for the 2014-2015 reporting period.

Groundwater interception rates will continue to be reviewed as mining progresses. A 2007 study by Connell Wagner determined the most important natural groundwater resource in the Newcastle / Cessnock area is found in the alluvial sediments. These aquifers are not predicted to be intercepted by Austar mining due to the depth of cover above the Greta Coal Seam. Groundwater monitoring within the alluvial aquifer supports this prediction with no depressurisation identified by monitoring in the Stage 2 area (**Section 3.6**). An additional alluvial aquifer monitoring bore is proposed in the LWB1-LWB3 mining area to monitor the alluvial aquifer during extraction of the Bellbird South longwall panels. Mining in the Stage 3 area to the end of the AEMR period has not yet reached alluvial areas.

2.9.4 Monitoring System

The site has a centralised monitoring and communication system (CITECT) that is managed 24 hours a day by the Control Room Operator. The system enables remote control of the major components and

communications across the entire mine site. The real time monitoring system includes a wide range of parameters including water pressure, flow rates and storage dam levels.

In addition, a range of water quality and flow data is collected underground. The following component areas are monitored regularly:

- Water pumped underground by events or processes controlled at the CHPP;
- Inflow from inseam drilled boreholes;
- Flow from stored water bodies;
- Water piped underground and used for mining operations; and
- Water intercepted underground and pumped out of the mine.

2.9.5 CHPP Water Management System

Monitoring System

All mine water pumped from underground inflow sources and the surface mine water dams (Austar Dam / Kalingo Dam) is pumped to the Process Water Dam at the CHPP after passing through the lime treatment plant and precipitate dam.

Depending on dam levels, flow rate and demand within the system, water is managed via the:

- Reverse osmosis (RO) water treatment system;
- Coal washing and handling system; and
- Stormwater runoff and management system.

Dirty water from the three systems is discharged back into the old underground mine workings where settling of sediment occurs prior to the water being collected and pumped to the surface again.

Clean permeate from the treatment plant is used as the water supply for underground mining operations and in the coal preparation plant. Excess treated water that is not utilised on site is discharged into Bellbird Creek in accordance with the conditions of EPL 416. The CHPP site, including water management infrastructure, is inspected daily by CHPP personnel.

Water Treatment System – Reverse Osmosis (RO)

Mine water collected from underground workings is passed through a lime softening process neutralising pH causing the precipitation of iron and other metals prior to treatment at the Water Treatment Plant (WTP). Limited oxidation occurs in Austar and Kalingo dams preceding this. The water then enters into the precipitation dam where the precipitated iron and other metals settle out with the assistance of a flocculation aid. Water then flows to the Process Water Dam from where it is pumped to the WTP.

The WTP contains three reverse osmosis (RO) units and can treat up to 6.2 ML/day in total of mine water with three units running in parallel at >50% recovery. The current configuration is two units in parallel (primary stage) with the third unit, a secondary recovery brine treatment stage, for additional clean water recovery from the brine of the primary units.

Water pumped from the process dam undergoes primary filtration, secondary filtration through multi-media filters and final tertiary filtration through cartridge/bag filters. Filtered water is then pumped through the RO Trains for permeate (clean water) production. The reject or brine (approximately <50% of feed water to the WTP plant) is returned underground via the Bellbird boreholes. The clean permeate is used in the CHPP or underground mine with any excess discharged to Bellbird Creek in accordance with EPL requirements.

Coal Handling Preparation Plant (CHPP)

The Austar CHPP is a heavy medium cyclone and spirals plant that operates at nominal capacity of 750 tph.

The CHPP requires an average 2.0 ML/day of water to operate. This water may be a blend of process dam water and permeate from the RO plant. Approximately 1.0 ML/day of fine tailings (approximately 30-45% solids) is returned underground to the abandoned Pelton underground workings.

Storm Water Run-Off and Management System

Stormwater management at the CHPP aims to contain all runoff in surface dams up to their capacity with excess dirty water runoff piped into the former Bellbird Colliery workings via a borehole. All dirty water runoff from the CHPP surface is contained within the dirty water management system, with the final destination in normal operation being the Water Pollution Control Dam in the eastern part of the CHPP site. Other areas of the CHPP site are used to act as on site retention structures to control stormwater flow to the Water Pollution Control Dam in large storm events.

Water levels in the Water Pollution Control Dam are monitored and pump status to the Bellbird Colliery borehole checked regularly. In the event of a major storm exceeding the Water Pollution Control Dam capacity, the overflow is directed to the Emergency Overflow Dam. A pump in the Emergency Overflow Dam can return storm water to the dirty water system to minimise the risk of off-site discharge at the licensed outlet (weir) of the Emergency Overflow Dam.

2.10 Hazardous and Explosive Materials Management

An explosive magazine storage facility is located at the Austar Pit Top. Two relocatable type magazines are installed in a bunded area. The magazines were prepared in accordance with AS 2187.1 – 1998, behind an earth embankment that is approximately 10 m high. The magazine stores have been located to provide appropriate separation distances from other buildings and facilities on the site, with appropriate security in place.

In addition, the following dangerous goods depots are located on site:

- Packaged oil store (20,000 L), in accordance with AS 1940 - 1993;

- Flammables cabinet (<100 litres); and
- Compressed gas store (<7 Size G Cylinders) containing no more than 4x E oxygen and 2x E acetylene plus nitrogen and argon in store.

2.11 Other Infrastructure Management

Other infrastructure associated with Austar Coal Mine includes the following:

- Austar Pit Top Facilities (mine drift, mine dewatering, workshop, equipment storage, services, coal clearance, and offices);
- Pelton CHPP (coal handling, water treatment, and coal transport);
- Aberdare Extended Emplacement Area (coarse reject emplacement);
- No. 1 Shaft (second egress man winder);
- No. 2 Shaft (mine dewatering);
- No. 3 and No.4 Shaft service facilities (ventilation fans, underground services);
- Kalingo Pit Top (including Kalingo Dam); and
- Kitchener Surface Infrastructure Site (ventilation shaft No. 5 and No. 6, ventilation fans, services borehole/drophole).

The above mentioned areas are part of the monthly environmental inspection at Austar.

2.12 Product Coal Transport

The existing approved coal transport system has continued to be utilised to transport product from the site. During the reporting period 470,366 t of product coal from Austar was transported 65 km by rail to Port Waratah Coal Services (PWCS) and Newcastle Coal Infrastructure Group (NCIG) ship coal loading facilities for sale on the export market.

During the 2015-2016 AEMR reporting period, 10,702.68 t of product coal was transported by road haulage. The product coal was transported by road to Port Waratah Coal Services (PWCS) ship coal loading facilities. PA08_0111 states that Austar may transport up to 60,000 t of coal by road in any calendar year. During the entire 2015 calendar year, 10,076 t of coal was hauled by road which complied with PA08_0111's road haulage limit. At the end of the AEMR period, in the 2016 calendar year 10,702.68 t of coal has been hauled by road.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 Environmental Management

Austar operates in accordance with the approved Environmental Management Strategy (EMS). The EMS is a requirement of Condition 1, Schedule 7 of PA08_0111 and Condition 1, Schedule 5 of DA29/95. **Figure 3.1** outlines the relationship between the EMS and the other management plans and monitoring programs. The objectives of the EMS include:

- provide an overall framework for environmental management;
- identify key environmental aspects to be addressed in the strategy and supporting plans and procedures;
- establish procedures for reviewing progress and implementing corrective actions; and
- provide a framework for review and continual improvement.

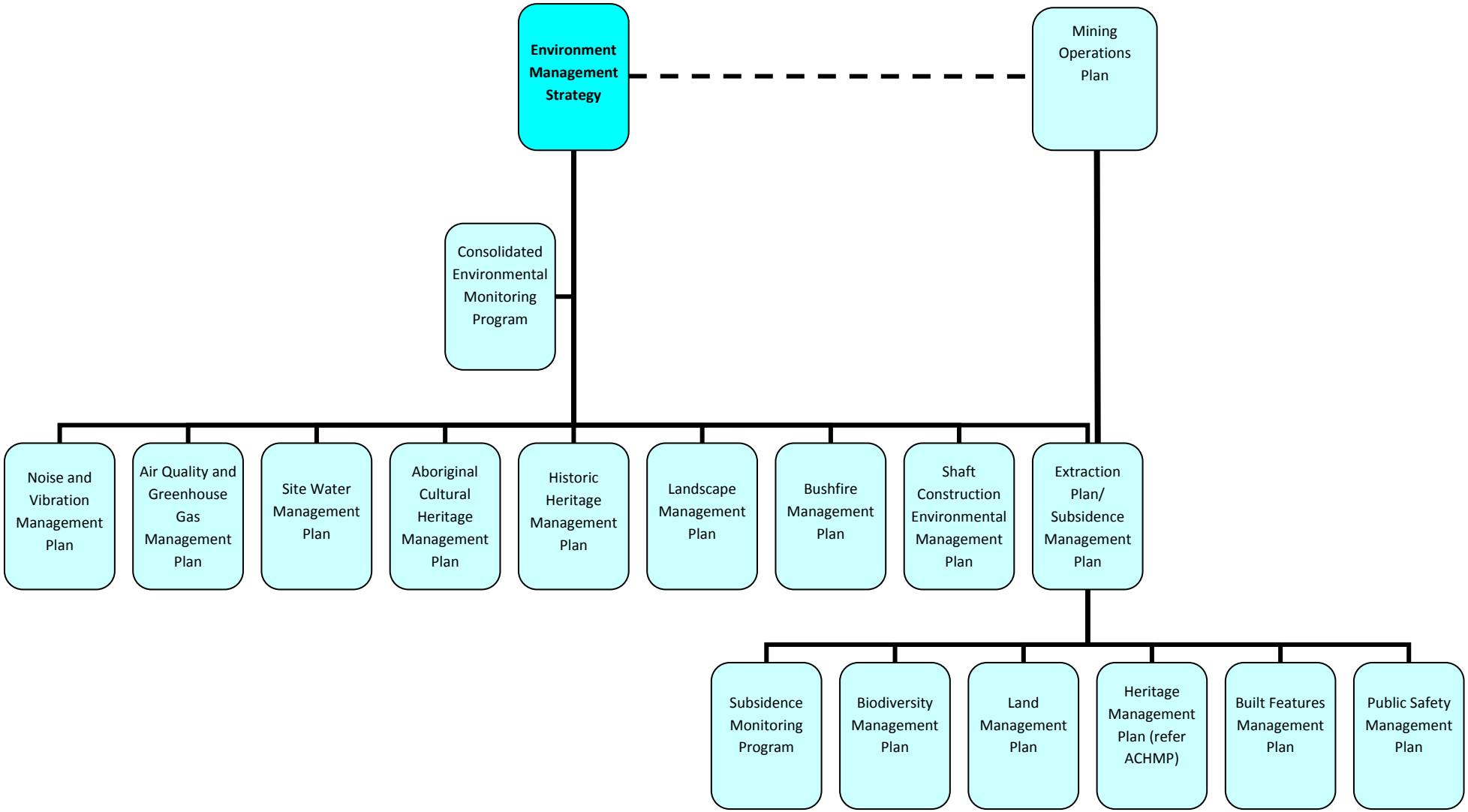


FIGURE 3.1 EMS FRAMEWORK & OTHER MANAGEMENT PLANS

Environmental monitoring at Austar is undertaken in accordance with requirements of the various individual management plans, the monitoring details of which are consolidated into the Environmental Monitoring Program (EMP) for ease of reference. The EMP monitoring details are summarised in **Table 3-1**.

TABLE 3-1 ENVIRONMENTAL MONITORING FOR 2015-2016 REPORTING PERIOD

Element	Frequency	Method
Air Quality	Monthly 6 daily Continuous	8 x static dust gauges (1 x temporary static dust gauge) 3 x high volume air sampler (HVAS) 1 x continuous dust monitor (TEOM)
Noise	Quarterly	Attended monitoring at 9 locations, 3 nights per quarter (CHPP, KIA and SIS)
Water – Surface	Monthly	Sampling at 5 locations as per EPL 416 and 4 locations per SWMP
Water – Ground	Quarterly	Sampling at range of locations in accordance with SWMP
Vibration	Continuous	Triaxial geophone at 2 locations
Subsidence	Intervals dependent on mining per the monitoring program	Field survey per Subsidence Monitoring Program
Meteorology	15 minute	Weather station at CHPP
Ecology	Bi-annual	Spring / Autumn survey over Stage 2 and 3 mining area
General Environmental Conditions	Monthly	Visual inspection of key facilities
Community	Checked daily during business hours	24 hour community complaint/enquiry line

Environmental monitoring is an integral part of the overall EMS. The measurement and evaluation of monitoring data allows for the assessment of performance against quantitative and qualitative standards and assists in the identification of any non-conformances or areas that may require additional attention. The location of Austar's surface water, groundwater, air quality, noise and vibration monitoring sites are shown on **Plan 2**.

3.2 Meteorological Data

In accordance with DA29/95, PA 08_0111 and EPL 416, Austar operate and maintain a meteorological station located at the CHPP (**Plan 2**). The following section summarises the meteorological data for the 2015-2016 reporting period.

3.2.1 Rainfall

The total monthly rainfall (mm) and number of rain days during the reporting period is shown in **Table 3-2** and **Figure 3.2**. A total rainfall of 558.2mm was recorded during the 2015-2016 reporting period. This represents a decrease of 256.6mm from the 2014-2015 total of 814.8mm. Additionally, it is

184.2mm below the annual mean rainfall for the Cessnock region of 742.4mm (Bureau of Meteorology Cessnock Airport AWS 1968 - 2016).

Please note that data wasn't recorded in September due to a problem with the rainfall monitor at Austar Coal. The data from Bureau of Meteorology Cessnock Airport AWS was used for the September period.

TABLE 3-2 RECORDED RAINFALL 2015-2016

Total Monthly Rainfall (mm)												
Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Total**
12.4	17	29.2	28.6	61	88	190.4	25.4	12.4	9.2	9.4	75.2	**558.2**
Number of Rain Days (>0.2mm)												
16	5	10	15	14	13	17	11	11	13	4	11	**140**

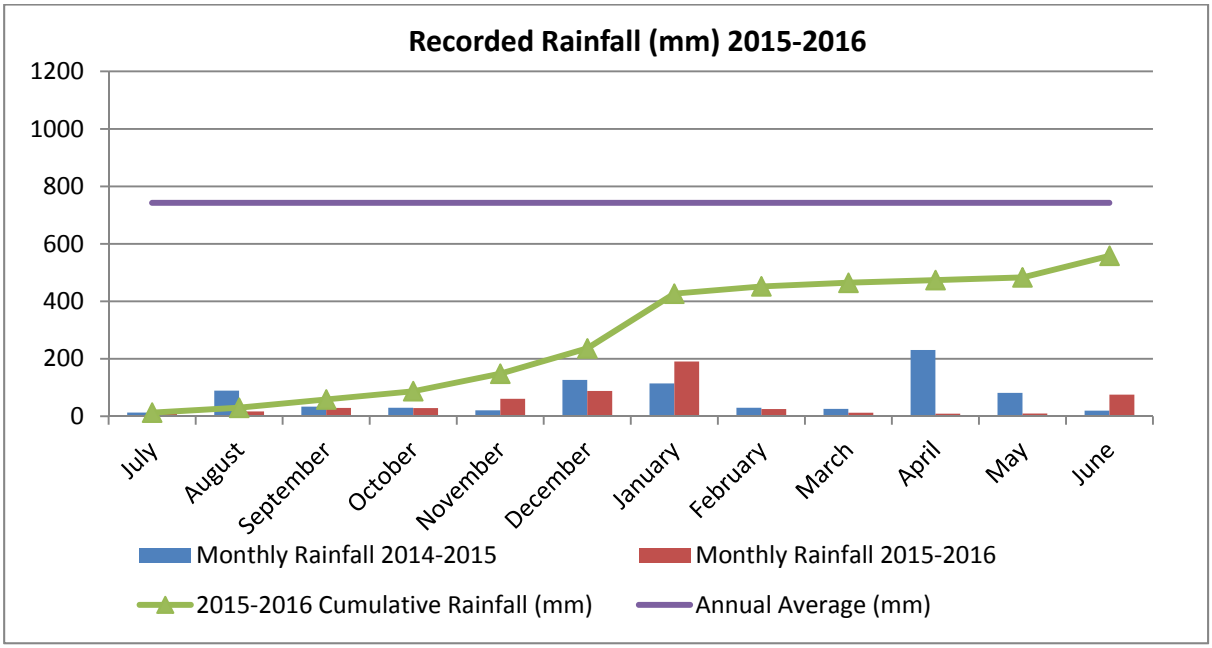


FIGURE 3.2 RECORDED RAINFALL AT AUSTAR METEOROLOGICAL STATION (MM) 2015-2016

3.2.2 Temperature

Monthly maximum and minimum temperatures recorded during the reporting period are shown in **Table 3-3**. Please note that data wasn't recorded in September 2015 due to a problem with the weather monitor at Austar Coal. The data from Bureau of Meteorology Cessnock Airport AWS was used for the September 2015 period.

TABLE 3-3 MONTHLY MINIMUM AND MAXIMUM TEMPERATURES 2015-2016

Minimum and Maximum Monthly Temperatures (°C)												
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**
Min	0.1	0.9	1.7	9.1	10.8	10.2	13.7	13.9	12.7	9.4	0.6	-0.4
Max	19.1	25.8	27.5	36.3	39.6	37.1	38.3	38.6	33.8	33.5	27.4	20

3.2.3 Wind Speed

The recorded wind speed and direction data is summarised in **Table 3-4**. The annual wind rose for the reporting period is displayed in **Figure 3.3**.

TABLE 3-4 MEAN MONTHLY WIND SPEED 2015-2016

Month	Mean Wind Speed (m/s)	Mean Maximum Wind Speed (m/s)	Dominant Wind Direction
July 2015	1.0	8.1	S
August 2015	0.9	7.9	SW
September 2015	1.3	7.5	S
October 2015	0.9	7.8	S
November 2015	0.9	7.5	E
December 2015	1.0	7.9	E
January 2016	1	7.6	SW
February 2016	0.9	7.1	S
March 2016	0.8	6.6	SW
April 2016	0.7	6.2	S
May 2016	0.7	7.3	S
June 2016	1.1	8.3	NNW

Note: The data for September was incomplete due to monitor failure during that period. The Mean Maximum Wind Speed is calculated form this incomplete data. Data from a separate wind monitor onsite was used for calculating the Mean Wind Speed and Dominant Wind Direction.

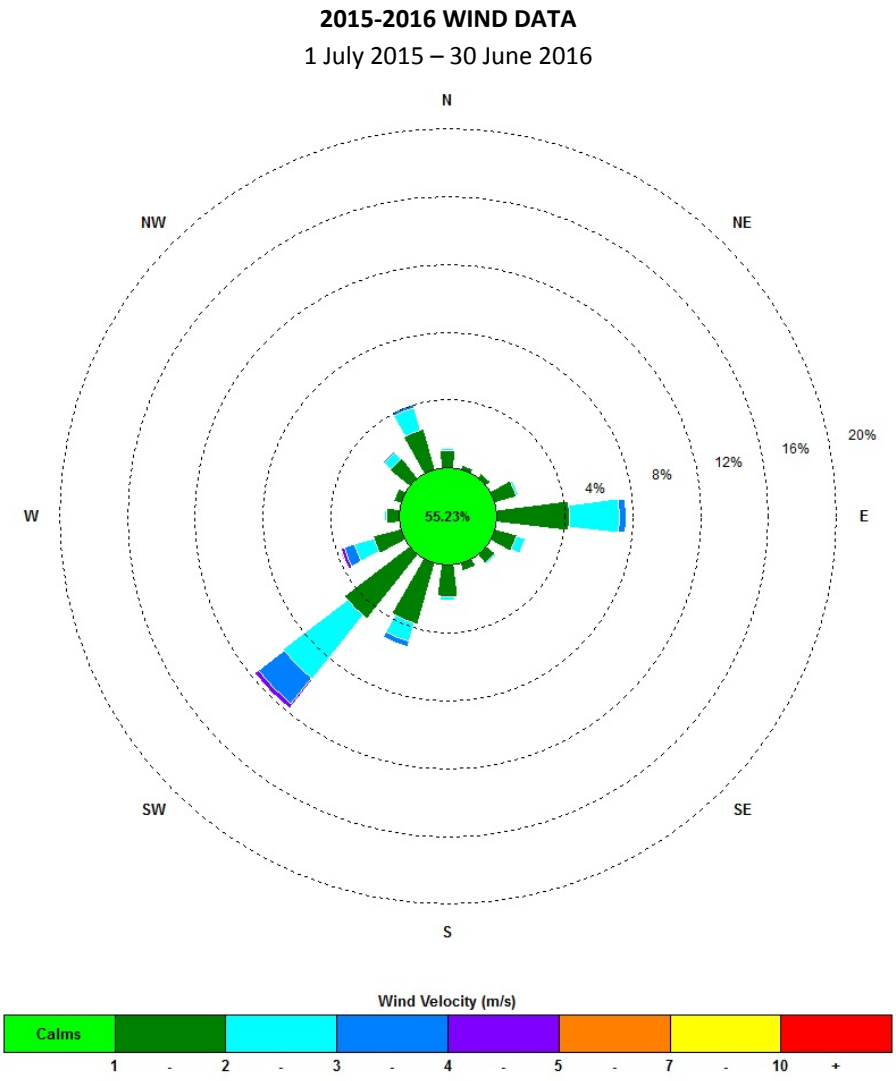


FIGURE 3.3 MONTHLY AVERAGE WIND ROSE 2015-2016

3.3 Air Pollution

3.3.1 Environmental Management

Austar has prepared an Air Quality and Greenhouse Gas Management Plan for the Mine Complex as required by PA08_0111 Schedule 4 Conditions 6 and 7. This Plan was approved by DPE on 26 June 2013.

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

The AQM&MP was implemented by Austar and utilises eight (8) dust depositional gauges, three (3) high volume air samplers (HVAS) and one (1) continuous dust monitor (TEOM). The HVAS and TEOM measure for particulate matter less than 10 micrometres (<=10µm), or more commonly referred to as PM_{10}. The location of Austar's air quality monitoring equipment is listed in **Table 3-5**, and shown on **Plan 2**.

TABLE 3-5 LOCATION OR AIR QUALITY MONITORING POINTS

Site	Location Description
Dust Gauge D1	Pyne Way, Mount View
Dust Gauge D2	Ellalong Road, Pelton Village
Dust Gauge D2A	Ellalong Road, Pelton Village
Dust Gauge D3	Bimbadeen Road, Mount View
Dust Gauge D4	Ellalong Village
Dust Gauge D5	Kalingo Infrastructure Area (Upcast Shaft 3)
TEOM D6	Bimbadeen Road, Mount View
Dust Gauge D7	Pelton Fire Trail, Quorrobolong
Dust Gauge D8	Coney Creek Lane, Quorrobolong
Dust Gauge D9	Kitchener Village
HVAS 1 (PM_{10})	Pyne Way, Mount View
HVAS 2 (PM_{10})	Ellalong Road, Pelton Village
HVAS 3 (PM_{10})	Coney Creek Lane, Quorrobolong

The air quality criteria for deposited dust, particulate matter <10µm (PM_{10}) and total suspended particulates (TSP) are provided in **Table 3-6**.

TABLE 3-6 AIR QUALITY CRITERIA FOR PARTICULATE MATTER

Description	Pollutant	Criterion	Averaging Period
Long Term Impact Assessment Criteria for Particulate Matter	Total Suspended Particulate (TSP) matter	90 µg/m^3	Annual
	Particulate Matter < 10µm (PM_{10})	30 µg/m^3	Annual
Short Term Impact Assessment Criterion for Particulate Matter	Particulate Matter < 10µm (PM_{10})	50 µg/m^3	24 hour
Long Term Impact Assessment Criteria for Deposited Dust	Depositional Dust	2 g/m^2/month (maximum increase in deposited dust level)	Annual
		4 g/m^2/month (maximum total deposited dust level)	Annual

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.*

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

3.3.2 Environmental Performance

In accordance with the AQM&MP, eight (8) dust depositional gauges, three (3) high volume air samplers (HVAS) and one (1) continuous dust monitor (TEOM) were operated by Austar during the reporting period. 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. A compilation of dust deposition results and PM_{10} monitoring data for the reporting period is provided in **Appendix A**.

Dust Deposition

Table 3-7 provides a summary of Austar's annual average for insoluble solids during the reporting period and the previous reporting period.

Depositional dust results during the reporting period were below the annual average criteria of 4g/m^2/month for insoluble solids, despite some individual month results being higher than the annual average criteria at some gauges. Overall dust results were generally similar to the 2014-2015 reporting year.

Dust results for the reporting period are consistent with dust results stated in the 1995 Environmental Impact Statement (EIS) for extension of underground mining operations at Pelton/Ellalong Colliery. 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.

TABLE 3-7 DUST GAUGES ANNUAL AVERAGE

No	Location	Annual Average Insoluble Solids (g/m^2/month) 2014/2015	Annual Average Insoluble Solids (g/m^2/month) 2015/2016
D1	Pyne Way, Mount View	1.0	0.9
D2	Ellalong Road, Pelton Village	1.5	1.4
D3	Bimbadeen Road, Mount View	1.2	0.9
D4	Ellalong Village	2.4	2.7
D5	Kalingo Infrastructure Area (Upcast Shaft 3)	2.3	3.3
D7	Pelton Fire Trail, Quorrobolong	0.7	0.9
D8	Coney Creek Lane, Quorrobolong	0.8	0.6
D9	Kitchener Village	0.9	0.9

Overall, a total of 20 monthly dust deposition gauges were contaminated with bird droppings/ insects, these results were left out of the annual average calculation.

Assessment criterion of a maximum increase of $2g/m^2$/month annual average for deposited dust was undertaken by comparing annual average deposited dust results for 2015-2016 to those from the previous reporting period. All gauges had a difference in annual averages of less than $2g/m^2$/month when compared with dust results from the 2014-2015 reporting period.

PM_{10} (Fine Dust)

The annual average PM_{10} results for the reporting period are provided in **Table 3-8**.

TABLE 3-8 PM_{10} HVAS RESULTS

No	Location	Annual Average PM_{10} ($\mu g/m^3$) 2014-2015	Annual Average PM_{10} ($\mu g/m^3$) 2015-2016
HVAS1	Pyne Way, Mount View	11.1	11.0
HVAS2	Ellalong Road, Pelton Village	11.9	12.5
HVAS3	Coney Creek Lane, Quorrobolong	10.8	9.6

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} results for the reporting period are well below the annual average criterion of 30 $\mu g/m^3$ at HVAS1, HVAS2 and HVAS3. Results have remained similar to the previous reporting period of 2014-2015 for HVAS1, HVAS2 and HVAS3.

The measured 24 hour PM_{10} did not exceeded the 24 hour maximum criteria of $50\mu g/m^3$ during any monitoring events during the 2015-2016 reporting period.

Total Suspended Particulates

The annual average TSP results for the reporting period are provided in **Table 3-9**.

TABLE 3-9 TSP HVAS RESULTS

No	Location	Annual Average TSP (µg/m^3) 2014/2015	Annual Average TSP (µg/m^3) 2015/2016
HVAS1	Pyne Way, Mount View	27.8	27.5
HVAS2	Ellalong Road, Pelton Village	29.8	31.3
HVAS3	Coney Creek Lane, Quorrobolong	27.0	24.1

The current project average for calculated Total Suspended Particulates (TSP) is well below the annual average criterion of 90ug/m^3. The TSP is calculated by multiplying the PM_{10} result by 2.5 in accordance with the method outlined in the Air Quality & Greenhouse Gas Management Plan.

PM_{10} (Fine Dust) Continuous Dust Monitoring

A Tapered Element Oscillating Microbalance analyser (TEOM) which measures PM10 on a real-time continuous basis is present at location D6 to the northeast of the CHPP. 24 hour average results for the reporting period and graphical representation of the running and cumulative average of PM10 results are provided in **Appendix A**. The annual average from the 2015-2016 reporting period was 9.5µg/m^3 for PM10. The TEOM commenced operation on 24 March 2015, and the annual average from the 2014-2015 reporting period, which recorded from 24 March 2015 to 30 June 2015 was 6.3µg/m^3 for PM10.

3.4 Erosion and Sediment

3.4.1 Environmental Management

In accordance with PA08_0111 Schedule 4 Condition 9, Austar prepared a Site Water Management Plan (SWMP) for the mine complex which includes an erosion and sediment control plan. The SWMP was approved by the Director-General of DPE on 17 May 2013.

In accordance with the SWMP, a range of erosion and sediment control measures have been implemented across the mining complex with the aim of preventing soil erosion and the entry of sediments into surrounding water bodies. Monthly environmental inspections are undertaken to inspect the sediment control structures for capacity, structural integrity and effectiveness. A summary of Austar's sediment and erosion control measures is outlined below. The performance of these measures is discussed in **Section 3.4.2** of the AEMR.

The Landscape Management Plan for Kitchener SIS documents management strategies for the Kitchener SIS in the short, medium and long term and was approved by DPE on 22 July 2013. Stabilisation works have been monitored at the SIS during the 2015-2016 reporting period with ground cover establishment.

The Landscape Management Plan and SWMP indicates that the erosion and sediment controls documented in the Shaft Construction Environmental Management Plan (SCEMP) will continue to be

implemented until the site is stabilised. Section 6 of the SCEMP details the erosion and sediment control strategy for the SIS during construction, which were implemented in accordance with the intent of this plan during the 2015-2016 reporting period.

Drainage Channels

Drains have generally been constructed with either a parabolic or trapezoidal cross section rather than a V-shape which can be easily eroded. Where possible, channels have been constructed with an adjacent earth bank. All channels are periodically inspected (at least every three months or after rain) to repair damage caused by scour, sediment deposition, channel obstruction and loss of vegetative cover.

Sediment Basins

Several small sediment basins have been constructed within the dirty water system. These are in addition to the main pollution control structures. The sediment control basins have been designed and located to contain dirty water from disturbed areas on site. The primary purpose of these basins is to contain sediment from normal rainfall events as well as reduce flow velocity during high rainfall events.

These structures are regularly maintained and cleaned out once capacity has reduced by over 10%. The structures are inspected after major rainfall events and any defects identified are corrected.

Within the footprint of the SIS disturbed area there are two designed sediment basins for surface water runoff management. These sediment basins are designed for a specific design rainfall event, and are managed using pumping to minimise overflow occurrences during greater than design rainfall. The sediment basins are inspected regularly by the Environment and Community Coordinator.

Sediment Fences

The use of sediment fences and hay bales provides interim protection from sediment runoff at Austar. Regular inspection of sediment fences and hay bales is undertaken at Austar following significant rainfall events.

3.4.2 Environmental Performance

During the 2015-2016 reporting period there was one reportable incident at the Kitchener SIS that involved water overflowing from sediment basins (the eastern sediment basin and lower water storage dam) after a rainfall event that exceeded the rainfall design capacity of the site. The sediment basin design size is based on a catchment area of 3.7 Ha (being the cleared area on the eastern side) and Type D soils for a 90th percentile five day rainfall depth of 42.8mm. The sediment dam has a volume of approximately 1.6ML. Details of the overflow is are as follows:

- 6/1/2016 – The incident involved the sediment basins at the SIS discharging over their lowest point into Black Creek, due to a greater than design rainfall event. A total of 103mm fell over the period 3 to 6 January 2016. The approved 90th percentile, 5 day rainfall design is 42.8mm.

The following actions were taken in response to this incident:

- Overflow was immediately reported to the EPA Environment Line and the Pollution Incident Response Management Plan was triggered;
- The EPA was provided with a written incident report;
- Pumping of water from the eastern sediment basin to the water storage dams occurred as soon as possible after the rainfall event ceased to reduce accumulated stormwater in readiness for future rainfall events; and
- Pumping of water from the water storage dams to Kalingo Dam occurred as soon as possible after the rainfall event ceased, to reduce accumulated stormwater in readiness for future rainfall events.

Details of this incident are also included in **Appendix G**.

3.5 Surface Water

3.5.1 Environmental Management

In accordance with PA08_0111 Schedule 4 Condition 9, Austar prepared a Site Water Management Plan (SWMP) for the mine complex which includes a surface water monitoring program. The SWMP was approved by the Director-General of DPE on 17 May 2013.

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:

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

In addition, grab samples are taken opportunistically from other points around the mine when required (e.g. sediment dams and mine water storage dams). The surface water monitoring locations are presented in **Table 3-10** and shown on **Plan 2**.

TABLE 3-10 SURFACE WATER MONITORING LOCATIONS

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 2,000 KL/day as annual average
Creeks – Stage 2 UG Mining Area	• **SWQ1** – Quorrobolong Creek Sandy Creek Road • **SWQ2** – Quorrobolong Creek Upstream of Stage 2 Area • **SWQ3** – Quorrobolong Creek Downstream of Stage 2 Area • **SWC1** – Cony Creek	EC pH Fe TSS	N/A N/A N/A N/A

3.5.2 Environmental Performance

Surface water quality data is presented in **Appendix B**. 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 Stage 2 and Stage 3 areas.

There was no discharge event from SW1 during the reporting period. At the permeate EPL discharge point SW6, water quality results for pH and EC were within EPL limits.

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

- the pH measured at individual sites remained relatively constant ranging between pH 6.60 (SW2) and 7.40 (SW4 & SW5) which was similar to the 2014-2015 range of pH 6.50 to 7.60;

- Surface water EC ranged between 120µS/cm (SW2) and 12,000µS/cm (SW5) which was similar to the 2014-2015 range of 220µS/cm (SW2) to 14,100µS/cm (SW5);
- TSS recorded a maximum of 61mg/L (SW5) with a minimum TSS of <1mg/L (SW2, SW4 & SW5) for the reporting period, the maximum TSS was significantly lower than the 2014-2015 range of <1mg/L (SW2 & SW4) to 442mg/L (SW4); and,
- Fe (Iron) recorded a minimum of <0.05mg/L (SW2) and a maximum of 18.2mg/L (SW5) for the reporting period, similar to the 2014-2015 range <0.05mg/L (SW2) of 19.5mg/L (SW4).

Results from SW5 (upstream of CHPP influence) for TSS were similar to those from the 2014-2015 reporting period but the maximum Fe read went from 9.44mg/L in 2014-15 to 18.2mg/L in 2015-16 reporting period. This is thought to be, most likely due to the ephemeral nature of the stream in this location with both sets of results remaining variable. SW5 samples were collected from small pools in the creek bed on numerous occasions throughout the reporting period.

Natural fluctuations in water quality in Quorrobolong and Cony Creeks were observed, with sample points displaying similar trends when compared to the previous reporting period. No environmental impacts upon surface waters from mining can be interpreted.

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

- The pH measured at individual sites ranged between pH 6.60 (SWQ3) and pH 7.80 (SWC1 & SWQ1), which was virtually the same as the 2014-2015 range of pH 6.60 to 7.85;
- EC ranged between 186µS/cm (SW Q2) and 3,810µS/cm (SW Q2), which was slightly higher than the 2014-2015 range of 112 to 3,020 µS/cm;
- TSS recorded a maximum of 599mg/L (SWC1) with a minimum TSS of <1mg/L (SWQ2, SWQ3 & SWC1) for the reporting period, the maximum TSS was higher when compared to the 2014-2015 range of <1 to 210mg/L; and,
- Fe (Iron) recorded a minimum of 0.44mg/L (SWQ1) and a maximum of 21.70mg/L (SWC1) for the reporting period, which slightly elevated compared to the 2014-2015 range of 0.39 to 15.30mg/L.

3.6 Ground Water

3.6.1 Environmental Management

In accordance with PA08_0111 Schedule 4 Condition 9, Austar prepared a Site Water Management Plan (SWMP) for the mine complex which includes a groundwater monitoring program. The SWMP was approved by the Director-General of DPE on 17 May 2013.

An environmental monitoring specialist is engaged by Austar to undertake quarterly groundwater monitoring and analysis in accordance with the SWMP, utilising seven (7) piezometers (MB01, MB02, AQD1073a, NER1010, WBH1, WBH2 and WBH3) to assess impacts on groundwater levels in the Stage 2 and Stage 3 areas. A new alluvial monitoring bore (MB03) is proposed to be installed in the LWB1-

B3 mining area in the 2016-2017 reporting period. The locations of these monitoring sites are presented in **Plan 2**.

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

There have been no known incidences of groundwater pollution as a result of Austar operations to date.

Groundwater resources in the vicinity of Austar operations include:

- Shallow alluvial aquifers associated with Bellbird Creek downstream of the CHPP. These groundwater resources are very limited in extent. The potential for Austar mining operations to cause pollution of this groundwater resource is very low and is mitigated by the surface water management controls that are in place at the CHPP and the leachate controls at the East and West Open Cut emplacement areas;

- Shallow alluvial aquifers associated with the Black Creek system. These groundwater resources are also very limited in extent. The potential for Austar mining operations to cause pollution of this groundwater resource is very low and is mitigated by leachate controls at the Aberdare Extended emplacement area and the surface water management controls that are proposed for the final landform at the CHPP. The Kitchener Surface Infrastructure Site off Quorrobolong Road also drains to the Black Creek system. The potential for groundwater pollution to result from operations at the Kitchener Surface Infrastructure Site is limited to spills and surface runoff and is mitigated by the surface water management system that is implemented at the site;

- Shallow alluvial aquifers associated with the Quorrobolong Creek system and its tributaries in the vicinity of Bellbird South and Stage 3 underground mining areas. Analysis indicates that underground mining operations will have negligible to low potential to impact on these shallow alluvial resources and negligible potential to result in pollution of this groundwater resource;

- Non-alluvial hard rock aquifers comprising principally of the coal seams and to a lesser extent, fractured zones within the upper parts of the Branxton Formation. Monitoring indicates that there are very limited groundwater reserves in the fractured rock aquifer and that what groundwater there is, exhibits high salinity. Mining operations have negligible potential to result in pollution of these resources; and

- Water stored within previous underground coal mine voids. Monitoring indicates that there are extensive volumes of this mine water associated with the coal seams and abandoned underground workings with the mine water exhibiting low pH, high iron concentrations, high manganese concentrations and high salinity. The mine contributes to the ongoing management of this groundwater and through the control of groundwater levels in the abandoned underground workings, minimises the potential for this poor quality groundwater

to discharge into surrounding surface waters. Reverse osmosis brine derived from the treatment of the mine water pumped from the underground workings and tailings are discharged underground into abandoned workings. This process effectively returns the existing contaminates from the coal seams and underground mine water to the abandoned underground workings. As a result operations at Austar mine have low potential to pollute these groundwater reserves.

3.6.2 Environmental Performance

A groundwater specialist was engaged to undertake quarterly groundwater depth monitoring in the Quorrobolong Creek alluvial aquifer (AQD1073a), in the non-alluvial hard rock aquifer (NER1010, MB01 and MB02), and in alluvial groundwater monitoring wells (WBH1, WBH2 and WBH3).

Appendix C illustrates the groundwater monitoring results at Austar during the reporting period. The graphs compare groundwater depth and rainfall, and pH and conductivity.

- All Stage 2 and Stage 3 monitoring bore groundwater levels responded to rainfall events in January 2016 and between June to September 2016. A general decline in groundwater levels occurred throughout late July 2015 to December 2015, and from late January 2016 to July 2016 correlating with below average rainfall in these months. Groundwater levels increased throughout July to September from increased rainfall/recharge, correlating with above average rainfall.

- Stage 2 NER1010 monitoring bore screened within a non-alluvial hard rock aquifer responded to rainfall events, although an overall declining trend in groundwater levels is observed throughout the reporting period within this bore after levels increased after a large rainfall event in the previous reporting period (on 20 to 22 April 2015 there was 231mm of rainfall).

- Overall, the groundwater levels within alluvial monitoring wells AQD1073a, WBH1, WBH2 and WBH3 have remained fairly high and at a similar level to each other. There were significant increases in the groundwater level at all alluvial aquifers as a result of the major rainfall event that occurred in the previous reporting period (on 20 to 22 April 2015 there was 231mm of rainfall). Groundwater levels slowly decreased to historical levels following this event during the 2015-2016 reporting period.

- Monitoring of groundwater level in MB01 commenced on 6 February 2015 and is located over longwall A9 adjacent to the already extracted longwall A8. The groundwater level remained steady during the monitored period.

- Monitoring of groundwater level in MB02 commenced in May 2015 and has been monitored manually during the reporting period. This monitoring bore is located over longwall A11 in the Stage 3 area, some distance away from active mining in the reporting period. The groundwater level showed a gradually increasing trend during the reporting period.

- Groundwater quality (pH and conductivity) display an observable difference between the December 2015 and June 2016 monitoring events. This may be explained by a change in

groundwater monitoring contractor and sampling methods between these events, and is considered unrelated to any potential mining impacts.

There has been no observable depressurisation of either the alluvial or fractured rock aquifers due to longwall extraction in the Stage 2 or Stage 3 mining area. Water quality data within the monitoring bores has revealed no obvious trends in relation to mining.

3.7 Contaminated Land

3.7.1 Environmental Management and Performance

A Phase 1 contamination assessment of the potential for contamination on was undertaken during the AEMR period, and further contamination assessments may be periodically undertaken through the life of the operation and immediately prior to site decommissioning. The report was prepared to draft stage at the end of the 2015-2016 AEMR period and will be finalised in the next AEMR period.

It is intended that areas on site that may be identified from the Phase 1 assessment as posing low to moderate risk of resulting in contamination, it is planned that further investigations will be postponed until the decommissioning phase or at the time of demolition/decommissioning of particular infrastructure. Alternatively, where there is a high risk of contamination that may lead to environmental harm, a Phase 2 – Detailed Investigation (e.g. Soil sampling and analysis) will be undertaken to verify the type, extent and level of contamination that may exist.

In the event that the results of the detailed investigation suggest that the site poses unacceptable risks to human health or the environment then a remedial action plan (Phase 3) will be prepared and implemented. This will be followed by Phase 4 – Site Validation and Reporting to demonstrate that the site clean-up complies with the relevant EPA guidelines.

During the operational phase of the site, contamination resulting from environmental incidents (e.g. Spills) and areas of high risk associated with hydrocarbon storage infrastructure will be cleaned up and appropriately managed (e.g. Remediated or disposed off site by an authorised waste contractor) as soon as possible after they occur. Further details on hydrocarbon contamination are provided in **Section 3.18**.

3.8 Threatened Flora and Fauna

3.8.1 Environmental Management

In accordance with DA No.29/95 Schedule 3 Condition 23, Austar have implemented an ecological monitoring program of riparian vegetation over Stage 2 Longwall Panels A3 to A5a, with particular reference to the River Flat Eucalypt Forest EEC. The Stage 2 monitoring program commenced with baseline surveys in 2008 and now has seven years of data prior to and following the commencement of mining which commenced in LWA3 in February 2009.

In accordance with PA08_0111 Schedule 4 Condition 9, Austar have implemented an ecological monitoring program as part of the Stage 3 Biodiversity Management Plan for Longwall panels A7 to

A10. Baseline surveys were carried out in Spring 2012 and Autumn 2013. Routine surveys were conducted during this reporting period in Spring 2015 and Autumn 2016.

There are no rare or threatened flora or fauna known to occur within colliery holding land that requires active management. Austar land ownership is approximately 2,600 hectares of land which is predominantly vegetated, where threatened flora and fauna are known to occur in the area. As such, any land disturbance that is required for the on-going operation is only carried out following the appropriate assessments.

Stage 2

Baseline ecological monitoring was undertaken for the Stage 2 mining area during autumn and spring 2008, and autumn and spring 2009. The 2009 Ecological Monitoring Report for Stage 2 Longwalls documented the baseline results from monitoring sites in the Stage 2 Mine Area. The results included a description of the vegetation structure, floristics and condition in such a way that comparisons with post-mining data can be readily made to determine any possible impacts of the longwall mining. Photo monitoring further supplements this data, providing a visual reference of the baseline condition of the vegetation and creeklines.

During the baseline survey all monitoring sites were found to be in varying states of disturbance, particularly due to past clearing and grazing practices and subsequent heavy weed invasion. Because the longwall mining had not commenced in this area at the time of the baseline surveys, the report indicated that no observed disturbance-related matters were a result of subsidence.

Stage 3

Baseline surveys ahead of mining longwalls A7 and A8 were undertaken in Spring 2012 and Autumn 2013. A monitoring location above each longwall and two additional monitoring locations outside the affected subsidence zone were surveyed. Baseline monitoring of each of these sites indicated that vegetation is stable, in good health and consistent with that of Lower Hunter Spotted Gum Ironbark Forest EEC.

3.8.2 Environmental Performance

Ecological monitoring during the 2015-2016 reporting period was undertaken by qualified ecologists during Spring 2015 and Autumn 2016 in accordance with Austar's Stage 2 Ecological Monitoring Program and Stage 3 Biodiversity Management Plan. The Study Area for the ecological monitoring is shown in **Figure 3.4** for Stage 2 and **Figure 3.5** for Stage 3.

Ecological monitoring concluded the following for the Stage 2 and Stage 3 areas:

- Longwall mining has now passed under monitoring Sites 3, 4, 6, 7, 12 and 13. Ongoing monitoring of these sites will consequently be tracking potential impacts resulting from longwall mining;
- None of the Stage 2 or Stage 3 sites currently appear to be experiencing impacts as a result of longwall mining (in particular surface cracking, subsidence, or resulting fluctuations to species numbers);

- Prior to the autumn 2016 monitoring event, Sites 7, 8, 11 and 14 were subject to a controlled burn event that removed much of the groundcover vegetation. Based on the precedent set by reference Site 10 (which was previously subject to bushfire), this vegetation should recover over time, with evidence of new shoots already apparent during the autumn 2016 monitoring. These sites will provide an opportunity to monitor native vegetation recovery as a response to bushfire.
- No obvious increase in rates of erosion or bank instability has been recorded at any of the Stage 2 sites monitored, or elsewhere in the Stage 2 Study Area;
- No obvious increase in dieback has been recorded at any of the Stage 2 sites monitored;
- Good levels of regeneration of canopy species were observed along the length of the Stage 2 monitoring sites and are considered likely to be a result of stock exclusion from the riparian zone;
- The photo monitoring indicates there have been no obvious visual changes to the health of Stage 2 or Stage 3 vegetation (with the exception of the controlled burn event mentioned above) since baseline photos were taken;
- The biggest threat to the ecological integrity of the Stage 2 sites continues to be weed infestation wandering Jew (*Tradescantia fluminensis*); however less blackberry (*Rubus fruticosus sp. agg*) appears to be present throughout Stage 2 than has been observed in previous years; and
- To date, there is no evidence of any impacts on ecological features as a result of longwall mining.

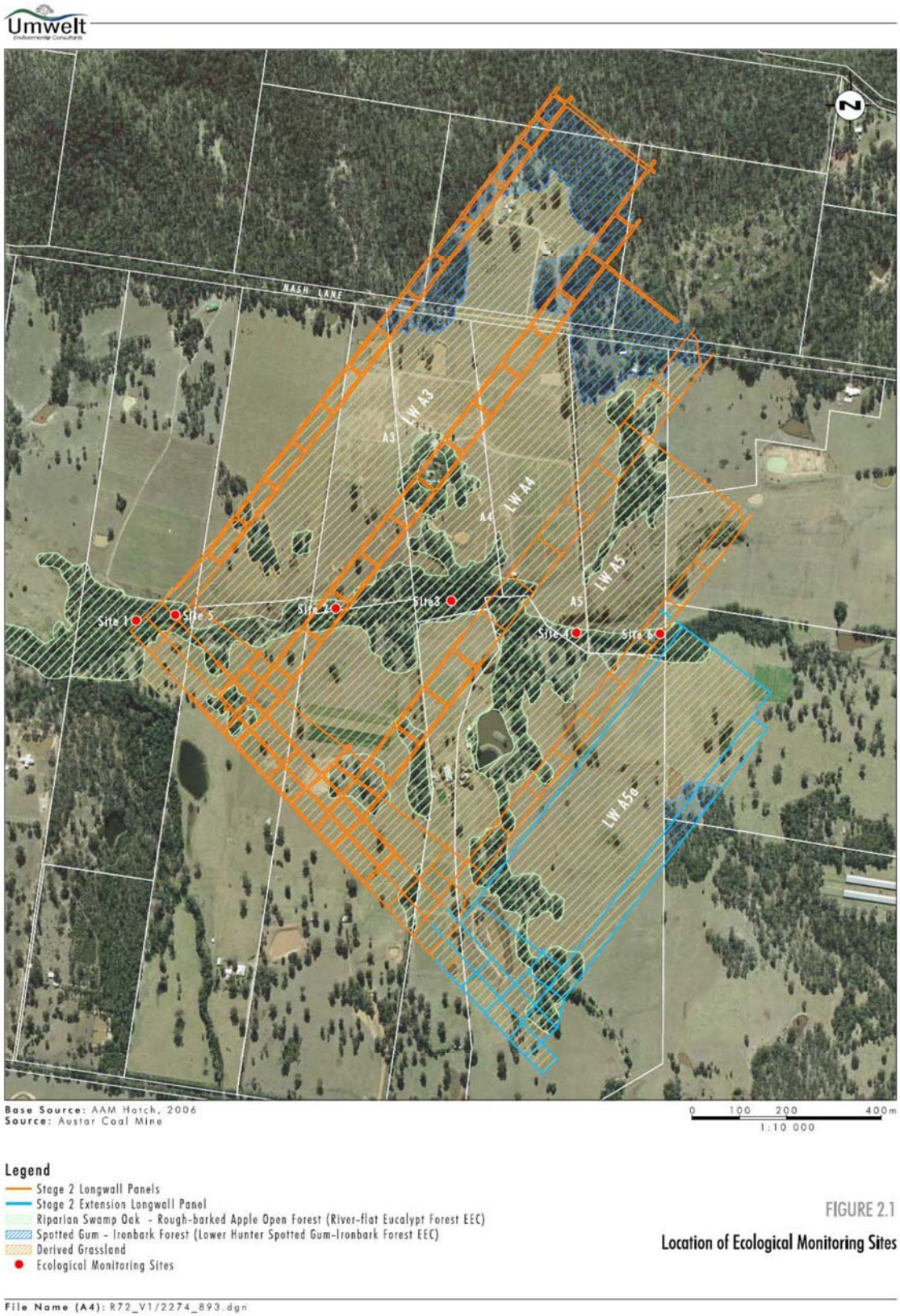


FIGURE 3.4 LOCATION OF STAGE 2 ECOLOGICAL MONITORING SITES

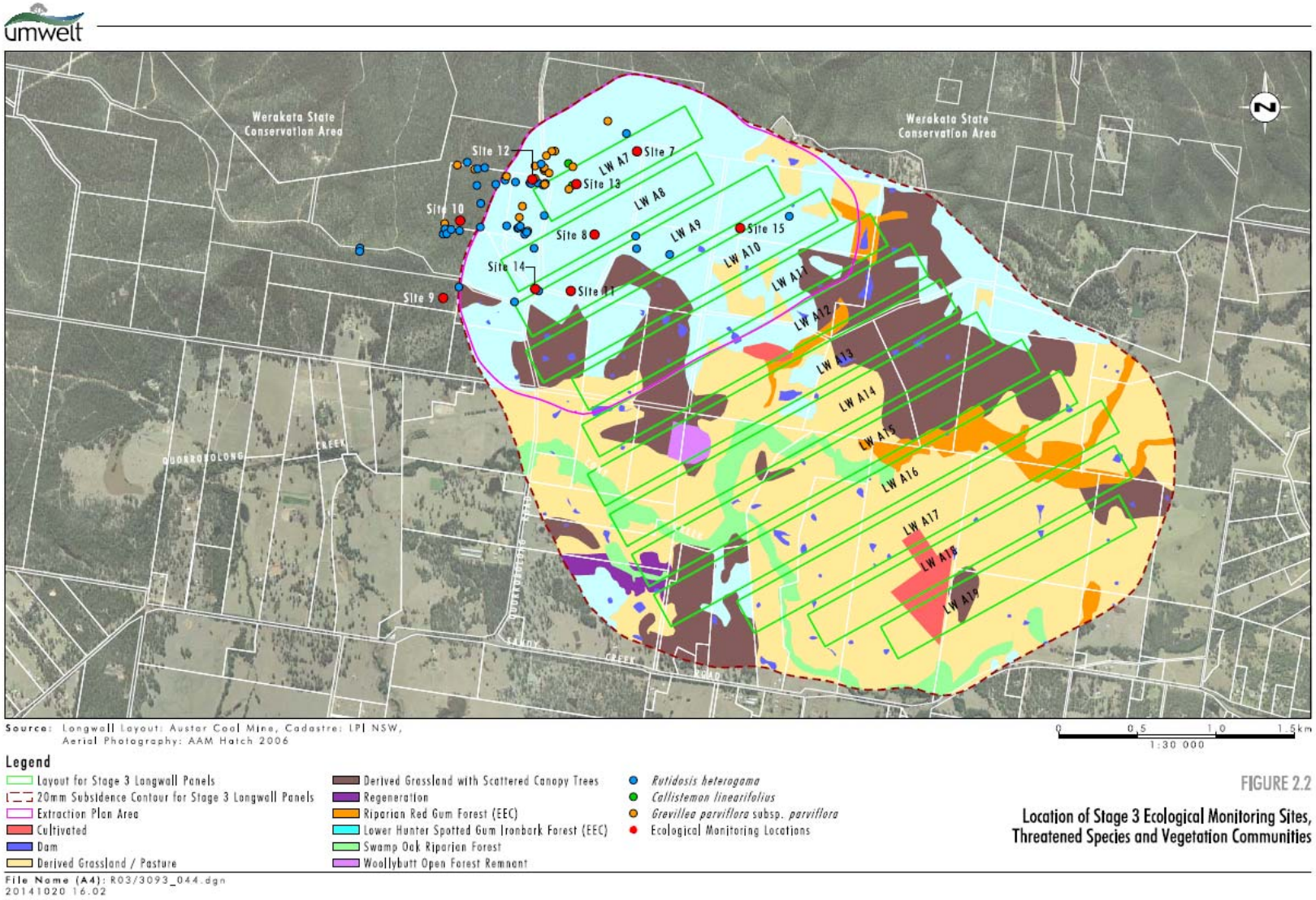


FIGURE 3.5 LOCATION OF STAGE 3 ECOLOGICAL MONITORING SITES

3.9 Weed and Feral Animal Management and Control

3.9.1 Environmental Management and Performance

Weeds Management

Mechanical and hand weed maintenance works were undertaken at the Kitchener Surface Infrastructure Site in areas undergoing stabilisation during the 2015-2016 reporting period.

Feral Animal Management

Little evidence of feral animal issues were identified during the reporting period. Feral animals will be controlled should the need arise.

3.10 Vibration and Blasting

3.10.1 Environmental Management

The mining complex Noise and Vibration Management Plan (NVMP) prepared in accordance with Schedule 4 Condition 3 of PA08_0111, was approved by the Director General DPE on 2 August 2013 and includes vibration considerations in relation to mining operations undertaken within the Stage 3 area.

Longwall mining did not take place during the reporting period but roadway development was continuous throughout. Austar have continued to implement the approved Noise and Vibration Monitoring Program (NVMP) with vibration monitors located at 159 Coney Creek Lane, Quorrobolong (V8), and at 345 Quorrobolong Road, Quorrobolong (V7).

The NVMP refers to a DECC guideline - *Assessing Vibration: a Technical Guideline* (DECC, February 2006) which provides 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.

No surface blasting activities were undertaken at Austar Coal Mine during the 2015-2016 reporting period.

3.10.2 Environmental Performance

Vibration monitoring in the mining area was undertaken during the 2015-2016 reporting period. In accordance with the NVMP, the monitors are set to trigger and record an event when vibration is greater than 1mm/second. Vibration monitoring results are presented in **Appendix D**.

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

above the longwall mining area. There was no longwall operations during the 2015-2016 reporting period, and subsequently, there were only 12 vibration events recorded during the reporting period. This is a significant reduction compared to the 2014-15 reporting period where 243 events were recorded and Longwall A8 was being extracted.

The maximum recorded event for the current reporting period was 3.17mm/s with the majority of events significantly less than this. Vibrations of this magnitude, whilst known to be noticeable for humans, are well below the lowest vibration level where a minimal risk of cosmetic damage may occur (15 mm/s). No vibration events during the reporting period exceeded DECC vibration criteria.

3.11 Noise

3.11.1 Environmental Management

The mining complex Noise and Vibration Management Plan (NVMP) prepared in accordance with Schedule 4 Condition 3 of PA08_0111, was approved by the Director General DPE on 2 August 2013. Monitoring during the 2015-2016 period was in accordance with the NVMP.

Periodic noise monitoring is conducted on a quarterly basis in accordance with NVMP by an independent noise consultant. Nine (9) key monitoring locations representative of the surrounding receivers 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 3-11** and presented in **Plan 2**.

TABLE 3-11 NOISE IMPACT ASSESSMENT CRITERIA AND GOALS

Receiver	Location	Receiver Description	Criteria/Goal
Nearest Potentially Affected Receivers to CHPP			
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
C4	84 Bimbadeen Road, Mt View	North of CHPP	L_{A90} 37 dB*
C5	43 Doyle Street, Mt View	North East of CHPP	L_{A90} 37 dB*
Nearest Potentially Affected Receivers to Kitchener Surface Infrastructure Site			
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			
K4	Nash Lane, Quorrobolong	East of Kalingo Infrastructure Area	L_{Aeq} 35 dB

Note: No criteria exist in licence or development consents for C4 and C5. The NVMP has adopted the criteria from C3 in the absence of specific criteria.

3.11.2 Environmental Performance

Activities from Austar complied with the relevant noise limits during at all monitoring locations during the 2015-2016 reporting period. There were reduced operations at the CHPP site with only development mining operations producing coal during the reporting period, however, the Kitchener Surface Infrastructure Site and the Kalingo Infrastructure Area were operating normally.

A summary of results from attended monitoring undertaken during the 2015-2016 reporting period is provided in **Table 3-12, Table 3-13** and **Table 3-14**.

TABLE 3-12 AUSTAR CHPP PERIODIC ATTENDED NOISE MONITORING RESULTS 2015-2016

Quarter	Period	Austar CHPP Only $L_{A90, 15\ min}$ (dB)				
		C1	C2	C3	C4	C5
	Noise Criteria	40	43	37	37	37
3 2015	Night	22	29	IA	NM	30
		IA	29	IA	IA	25
		IA	IA	IA	IA	NM
4 2015	Night	IA	IA	IA	NM	NM
		<25	IA	IA	IA	IA
		NM	IA	IA	IA	IA
1 2016	Night	NM	IA	IA	IA	IA
		<25	25	<25	<20	<25
		<25	<25	IA	IA	NM
2 2016	Night	NM	30	<25	<30	<25
		36	<30	<30	NM	<30
		30	31	IA	IA	30

Note: These are results for Austar CHPP in the absence of all other noise sources;
Bolded results indicate exceedance of criteria.
IA denotes inaudible. NM denotes not measurable.

TABLE 3-13 AUSTAR SIS ATTENDED NOISE MONITORING RESULTS 2015-2016

Quarter	Period	Austar SIS Only $L_{Aeq, 15\ min}$ (dB)		
		K1	K2	K3
	Noise Criteria	35	35	35
3 2015	Night	<22	IA	<20
		30	29	<25
		IA	IA	IA
4 2015	Night	IA	IA	IA
		<25	IA	IA
		IA	IA	IA

Quarter	Period	Austar SIS Only $L_{Aeq, 15\ min}$ (dB)		
		K1	K2	K3
	Noise Criteria	35	35	35
1 2016	Night	IA	IA	IA
		<25	<20	IA
		<20	IA	IA
2 2016	Night	26	<20	<20
		27	IA	IA
		27	IA	IA

Note: These are results for Austar SIS in the absence of all other noise sources;
Bolded results indicate exceedance of criteria.
IA denotes inaudible. NM denotes not measurable. NA denotes no access to monitoring point.

TABLE 3-14 AUSTAR KIA ATTENDED NOISE MONITORING RESULTS 2015-2016

Quarter	Period	Austar KIA Only $L_{Aeq, 15\ min}$ (dB)
		K4
	Noise Criteria	35
3 2015	Night	22
		30
		IA
4 2015	Night	20
		25
		IA
1 2016	Night	IA
		<20
		IA
2 2016	Night	<30
		<25
		28

Note: These are results for Austar KIA in the absence of all other noise sources;
Bolded results indicate exceedance of criteria.
IA denotes inaudible. NM denotes not measurable.

CHPP Noise Pollution Reduction Program

Austar has been undertaking a voluntary noise pollution reduction program (PRP) in consultation with the EPA over several years. The PRP commenced with a noise impact assessment titled *Austar Coal CHPP Assessment of Noise Impacts* (Global Acoustics, September 2008). The assessment was prepared in accordance with Section 10 of the Industrial Noise Policy (INP, DECC 2000), which provides guidance on the application of the INP to existing premises, such as the Austar Coal CHPP.

The EPA issued a notice of variation to Environment Protection Licence No. 416 on 10 February 2014. The Notice acknowledged completion of various noise control projects, and the provision of status reports. Condition U1 of the varied EPL requires a Premises Noise Assessment (PNA) to be conducted in accordance with the INP by 31 August 2014. The assessment of noise levels in the PNA was intended to establish noise levels that can be included as conditions in the EPL.

The assessment included:

1. Project Specific Noise Levels (PSNLs) for the nearest noise sensitive receptors;

2. Predicted or measured noise levels at these noise sensitive receptors due to all activities and operations carried out at the premises;

3. Proposed noise limits for the premises (criteria) derived with regard to the PSNLs and predicted noise level contributions that can be placed on the licence; and

4. Details of methods to determine compliance with noise limits.

Austar completed the PNA for the operations and activities carried out at Austar's licenced premises in accordance with the requirements of condition U1 in August 2014.

After completion of the comprehensive PNA, Austar recognise that existing predicted noise levels are significantly greater than any derived contemporary PSNL prepared in accordance with the INP for several operational areas where no current noise limits exist, or where an older style noise limit (L_{A90}) exists. Austar recognises the processes identified in Section 10 of the INP for existing premises where this situation occurs.

Austar also recognises the extensive history that mining operations at the premises have been conducted, with mining having commenced at Pelton Colliery in 1916, and the more significant current infrastructure of the Austar Mine Complex (Pit Top, Pelton CHPP, Aberdare Extended Emplacement Area) having been in operation in some instances since the 1960s or 1970s. Despite the proximity to Austar's infrastructure and noise generating activities to noise sensitive receivers, Austar receive very few community noise complaints. With over 50 years of operation for some areas, Austar's mining operations may be considered a feature of the acoustic environment of the area. With mining operations returning to normal levels in the 2016-2017 reporting period, Austar will progress the PRP in consultation with the EPA during subsequent reporting periods.

3.12 Visual and Lighting Management

3.12.1 Environmental Management and Performance

All of the infrastructure areas within Austar are well screened, mostly by native vegetation which limits the views to operational areas from public viewpoints. Austar operates 24 hours per day, seven days per week. For safety and security reasons, this requires Austar to have certain operational areas under lighting during non-daylight hours. While fugitive light may be seen from some public areas, lights are positioned to minimise extraneous light off site.

The principles followed for the use of lights are as follows:

- Main flood lights are directed away from the nearest residences;
- Portable lights used are also directed away from residences;
- Flood lights attached to towers are adjustable to enable fine tuning; and
- If necessary, the location of portable lights are varied to ensure that extraneous light catchment is minimised.

Austar did not receive any community complaints during the reporting period in relation to lighting and visual aesthetics.

3.13 Aboriginal Heritage

3.13.1 Environmental Management and Performance

Previous archaeological research has identified 36 Aboriginal archaeological sites in the vicinity of the Bellbird South (Stage 2 and LWB1-LWB3) and Stage 3 mining areas. In addition the location of registered sites within the wider area is known from AHIMS search data.

The majority of known sites over the mining area listed have been assessed to be of low scientific significance, being small artefact scatters or isolated finds found in open (and frequently disturbed) contexts. Site types that are rarer or sites that have research potential and are of higher scientific significance, include a grinding groove site recorded as ACM6 which is considered to be of low to moderate scientific significance, and three artefact scatters and isolated finds (ACM9, ACM10 and ACM14) also assessed as having low to moderate archaeological significance. Aboriginal stakeholders involved in previous investigations of the area have identified that all archaeological sites are of cultural significance, but that grinding groove sites and larger artefact scatters are of particular significance.

Austar has prepared an Aboriginal Cultural Heritage Management Plan which aims to define Aboriginal cultural heritage management and mitigation strategies for the Austar Mine Complex including: responsibilities of all parties; on-going Registered Aboriginal Party consultation; compliance with current legislative requirements; and timeframes for required heritage works. During the 2015-2016 reporting period the ACHMP was updated to include the Bellbird South LWB1-LWB3 area, to be distributed for consultation to Registered Aboriginal Parties and OEH during the next reporting period.

Archaeological inspections during the reporting period included due diligence inspections prior to the commencement of proposed tailings borehole operations. There were no Aboriginal archaeological material was identified during the due diligence inspections.

3.14 Historic Heritage

3.14.1 Environmental Management and Performance

The Stage 3 Project Historic Heritage Management (HHMP) prepared in accordance with Schedule 4 Condition 3 of PA08_0111, was first approved by the Director General DPE on 19 April 2013, and an update was approved by DPE on 19 February 2014. The HHMP outlines management strategies for historic heritage items within the Stage 3 mining area, and other listed heritage sites in the Austar mine complex.

Historic Heritage assessments of the Bellbird, Pelton and Cessnock No.1 (Kalingo) Collieries were completed by Umwelt in November 2008 as part of rehabilitation proposals for the site in the current MOP. The heritage assessment outlines management strategies for assessed extant structures and foundations within these collieries, including items that require no further management. A structural engineer's report on the condition of existing structures was also completed in August 2008.

The DI-DRE has indicated previously that many of the structures from these collieries present a significant safety liability and they would like to see progress to rehabilitation of these structures. It is intended that structures and foundations will continue to progress towards demolition, with reference to recommendations of the Historical Heritage assessments, to satisfy commitments of the current MOP.

Austar will continue progressing Heritage issues in relation to rehabilitation commitments with Council prior to rehabilitation works occurring.

3.15 Spontaneous Combustion

3.15.1 Environmental Management and Performance

The Greta Seam has a long history of susceptibility to spontaneous combustion. The most recent evidence of this is the fire in the Southland Mine in December 2003. Austar have implemented the Spontaneous Combustion Hazard Management Plan (SCHMP) at the mine to control spontaneous combustion risks. This SCHMP utilises enhanced gas monitoring and management through use of:

- A tube bundle system and gas monitoring analyses;
- An on-site gas chromatograph for gas analysis;
- Air free gas analysis techniques;
- Training of mine officials;
- Nitrogen rich, pressurised balance chambers that help to seal goaved voids;
- Installation of a nitrogen inertisation plant; and

- An infrared camera for scanning of hot areas on coal pillars and stockpiles.

There was no evidence of spontaneous combustion occurring underground during the 2015-2016 reporting period.

Coarse reject piles at the Aberdare Coarse Reject Emplacement area experienced heating and emitted odours for a brief period in February 2016, before they were pushed over with a dozer and compacted. This was the cause of community complaint at that time (Refer to Appendix ____). The area was attended to by pushing the coarse reject piles into thin layers and wetting down until no remnant heat remained. No further complaint was received after the area was suitably treated.

3.16 Bushfire

3.16.1 Environmental Management and Performance

Austar owns significant areas of land surrounding the pit top and coal handling and preparation plant. These properties are covered predominantly by native woodland and forests, with occasional grassland paddocks. These areas are considered valuable in providing a buffer zone to reduce the impact of operations on nearby private residences, however, do require active management to minimise the risk of bushfires originating, or spreading through Austar property.

A Bushfire Management Plan (BFMP) was developed in September 2002 to ensure the land owned by the mine is managed in a way that minimises the risk of bushfire and to reduce the risk of fire originating on Austar owned land and spreading to adjacent properties. Austar is currently reviewing the BFMP.

During the reporting period a number of activities were undertaken to reduce the risk of bushfire including vegetation slashing and maintenance within asset protection zones.

3.17 Mine Subsidence

3.17.1 Environmental Management

In accordance with PA08_0111 Schedule 3 Condition 4, and DA29/95 Schedule 3 Condition 3A, Austar are required to prepare and implement an Extraction Plan prior to the commencement of any second workings in the Stage 3 area or the Bellbird South LWB1-B3 area.

Austar prepared the Longwalls A7-A10 Extraction Plan to satisfy the requirement for both the Extraction Plan and the Subsidence Management Plan, of which the Extraction Plan was most recently approved in January – February 2014 to reflect changes to the mine plan approved by modification to PA08_0111 approved on 17 December 2013 (PA08_0111 MOD3).

Austar prepared an Extraction Plan for Longwall Panels B1 to B3 in May 2016. Approval of the Extraction Plan was pending at the end of the AEMR period.

Subsidence monitoring for Stage 3 at Austar during the reporting period was completed in accordance with the subsidence monitoring strategy which forms part of the Extraction Plan/Subsidence Management Plan. Monitoring is conducted in affected areas pre and post mining on a monthly and then a quarterly basis until secondary extraction is complete in that panel.

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. For Stage 3 the Extraction Plan relies on a set of individual management plans which are intended to address impacts to particular environmental or built features within the Extraction Plan area.

3.17.2 Environmental Performance

Austar had completed extraction of Longwall A8 on 24 June 2015, after commencing A8 in June 2014. An End of Panel report for Longwall A8 was prepared in accordance with Condition 18 of the SMP Approval for Longwall A8 and was included as an appendix in the 2014-2015 AEMR, so is not included again in the 2015-2016 AEMR.

Subsidence monitoring has been undertaken in accordance with the Subsidence Monitoring Program. Summary results are displayed in **Table 3-15** and compared against maximum predicted subsidence derived from the subsidence predictions from MSEC Report MSEC650 (2013) which supported a modification to the Longwall A8 geometry (shortened start position and lengthened finish position) and associated Extraction Plan/SMP Revision 3.

TABLE 3-15 ACTUAL VS MAXIMUM PREDICTED SUBSIDENCE PARAMETERS

LW	Maximum Predicted Cumulative Subsidence (mm)	Actual Cumulative Subsidence (mm)	Maximum Predicted Cumulative Tilt (mm/m)	Actual Cumulative Tilt (mm/m)	Maximum Predicted Cumulative Tensile Strain (mm/m)	Actual Cumulative Tensile Strain (mm/m)	Maximum Predicted Cumulative Compressive Strain (mm/m)	Actual Cumulative Compressive Strain (mm/m)
After A8	1175	773	5.5	3.9	0.8	0.7	1.4	1.4

Note Predictions for strain after A8 have been converted from curvature predictions from the MSEC650 using the relationship strain = 15 x curvature. The factor of 15 was adopted (rather than 10 which is typically used in the Newcastle Coalfield) due to the higher depths of cover and better correlation with the local monitoring at Austar and Ellalong.

Subsidence monitoring results from Stage 3 longwalls have been consistently within the maximum predicted range as shown in displayed in **Table 3-15**. The Statement of Commitments for PA08_0111 commits to subsidence from the Stage 3 area being within Maximum Upper Bound subsidence parameters. Summary results from subsidence monitoring of A8 are compared to Upper Bound subsidence parameters from MSEC484 (which were provided in the Stage 3 Environmental Assessment) in **Table 3-16**.

TABLE 3-16 ACTUAL VS UPPER BOUND SUBSIDENCE PARAMETERS – STAGE 3

LW	Upper Bound Cumulative Subsidence (mm)	Actual Cumulative Subsidence (mm)	Upper Bound Cumulative Tilt (mm/m)	Actual Cumulative Tilt (mm/m)
After A8	2050	773	7.5	3.9

In summary, surface subsidence recorded after extraction of A8 has been recorded at approximately 400mm less than maximum predictions, and 1280mm less than Upper Bound predictions. There have been no perceptible impacts to the environment or increases in public safety risk. At the completion of mining A8 there was no abnormal behaviour observed that required particular review.

The mine subsidence movements resulting from the extraction of Longwall A8 were monitored using the following:

- Line A7;
- Line A8;
- Line XL3; and
- Quorrobolong Road Line.

The locations of these monitoring lines and subsidence monitoring graphs for the Stage 3 area are included **Appendix E**.

The ground movements measured along Lines A7, A8 and XL3 indicate that the observed subsidence, resulting from the extraction of Longwall A8, were generally similar to or less than the maximum predicted. The profiles of observed subsidence also reasonably matched those predicted, but with reduced magnitudes. Only low level subsidence (approximately 210mm) was measured along the Quorrobolong Road Line as this monitoring line crosses the back end and corner of the longwalls.

No subsidence management actions were required to be undertaken as a result of A8 extraction during the 2015-2016 reporting period.

3.18 Hydrocarbon Contamination

3.18.1 Environmental Management

All fuel and oil storage areas at the CHPP and Austar Pit Top areas are bunded. Hydrocarbon waste material and liquids are disposed of off-site via an authorised waste contractor.

Measures that are implemented at Austar to improve hydrocarbon management include:

- Rationalisation of the surface storage area;
- Designating specific areas within the pit top area to prevent the spread of equipment as well as limiting the storage of equipment containing oil to hardstand areas;
- Upgrades to the oily water waste treatment system;
- Bunding of hydrocarbon fill and dispensing points; and
- Installation of a dedicated used oil drum draining rack, oil collection system and oil drum disposal facility.

Fuel and oil storage areas at Austar are inspected on a monthly basis by the Environment and Community Coordinator.

3.19 Methane Drainage / Ventilation

3.19.1 Environmental Management and Performance

A mine gas monitoring station is located on the surface near the No.3 Shaft facility. Monitoring data indicates low levels of seam gas emissions and a composition that is predominantly CO_2 (2015-2016 Average 0.14%) with some CH_4 (2015-2016 Average 0.05%) under normal operating conditions. Gas desorption tests have been carried out previously in several boreholes and at development faces in the mining area. This indicated seam gas levels in the area are low, however have risen slightly in the Stage 3 area.

3.20 Public Safety

3.20.1 Environmental Management and Performance

Entry to the site is managed as follows:

- All visitors and members of the public are required to report to the main office prior to entering the mine;
- The private haul road has gates which are locked outside of operating hours;
- Key facilities and areas are fenced as appropriate;
- When public access is required, inductions are undertaken and inspections supervised by colliery personnel; and
- A private security company is employed to patrol the site particularly after hours.

Signs have been erected on affected roads and trails in the Stage 2 and Stage 3 mining areas to inform affected residents that they are entering a subsidence zone. This is part of the Public Safety Management Plan for Stage 2 and Stage 3 longwall panels.

3.21 Other Issues and Risks

Other environmental risks which have been previously recognised and addressed in the management systems at Austar include:

- Acid mine drainage;
- Pollution events from excessive rainfall;
- Noise issues arising from the operation (particularly the CHPP);
- Rehabilitation liability;
- Mine subsidence; and
- Risk of trespasser entering onto the property from the adjacent town, surrounding bushland and roads.

3.22 Independent Environmental Audit

An Independent Environmental Audit for Austar was led by Trevor Brown & Associates during November 2014, with the audit findings reported in the previous AEMR. The next Independent Environmental Audit is due in 2017.

4 COMMUNITY RELATIONS

4.1 Environmental 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.

In the 2015-2016 reporting period a total of 9 complaints were received, a decrease on the 15 complaints in 2014-2015 reporting period. A summary of all the complaints received during the reporting period is provided in **Appendix F**.

Complaints received during the 2015-2016 reporting period were in relation to odour and noise. Full details of the complaints are provided in **Appendix F**.

4.2 Community Liaison

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

4.2.1 Community Consultative Committee (CCC)

The Austar Community Consultative Committee (CCC) continued to operate during the 2015-2016 reporting period. Meetings are held on a quarterly basis and the membership is shown in **Table 4-1**. During the reporting period Austar held four CCC meetings, which occurred on the following dates:

- 12 August 2015;
- 18 November 2015;
- 17 February 2016; and
- 26 April 2016.

TABLE 4-1 AUSTAR COMMUNITY CONSULTATIVE COMMITTEE (CCC) DURING THE 2015-2016 REPORTING PERIOD

Organisation/Representative	Name
Independent Chairperson	Ms Margaret MacDonald-Hill
Cessnock Council Representative	Clr Jeff Maybury or Clr Cordelia Troy
Community Representatives	Mr Alan Smith Mr David Holmes Mr Peter Sturrock
Company Representatives	Mr Brian Wesley Mr Gary Mulhearn Mr Josh Chadwick

Austar coordinates these meetings and provides information before and during the meetings on mining progress, community programs and environmental performance. Minutes from meetings are prepared by Austar in a format and manner acceptable to CCC members. The major discussion points from the Austar meetings in 2015-2016 were:

- Current mining operations – underground, CHPP, Kitchener SIS and rehabilitation;
- Environmental monitoring and results;
- Environmental incidents;
- Complaints management;
- Community sponsorships;
- 2014-2015 AEMR preparation and feedback;
- Bellbird South Mining Area.

These discussions led to outcomes aimed at improving the understanding and management of these issues. Minutes of CCC meetings are published on the Austar Coal Mine website.

4.2.2 Resident Consultation

During 2015-2016, Austar Coal Mine consulted with individual residents who live in areas potentially affected by the mine. This consultation was often conducted informally, in a manner that allowed the residents to openly discuss issues of importance to them. Monitoring results were often provided and discussed as part of this resident consultation.

Landholders over the LWB1-B3 mining area were consulted with during the preparation of the environmental assessment for the modification application to DA29/95. These residents were provided with updates by letter to inform of the location and timing of extraction of the proposed longwall panels, the predicted environmental impacts, and details of the environmental assessment and modification process.

Residents were also notified of the approval of the modification to DA29/95 (approved in January 2016), and provided details of the Extraction Plan preparation process including the types of monitoring to be undertaken in the Extraction Plan area, and individual landowner specific Built Features Management Plans. Consultation with landholders will continue in the next reporting period with the results of monitoring of subsidence and environmental impacts over the mining area.

4.2.3 Community Contributions

During the reporting period, Austar provided financial assistance for a number of community activities and projects. Projects and groups sponsored included, but not limited to:

- Hunter Valley Steamfest Maitland;
- Cessnock Mayoral Scholarship;
- Let's fight the Fight for Alex;
- Westpac Helicopter
- Central Coast Axeman - 2015 Miners Challenge Memorial Woodchop
- Cessnock High School - end of year presentation;
- Shamrock Soccer Club
- Cessnock Rugby League Football Club
- Kurri Kurri Rugby League Football Club

5 REHABILITATION

This section describes land management within the mining lease area and includes land use objectives, landscaping operations, and a review of the rehabilitation performance of mining and infrastructure areas.

5.1 Buildings

Several buildings are proposed to be demolished as part of site rehabilitation works including the remaining buildings at the Bellbird site, Kalingo site and several buildings and the pony stables at the CHPP site.

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

The needs of Heritage Management will need to be balanced against structural and safety issues identified in the Structural Engineer's report and by DI-DRE. Consultation will continue with Cessnock City Council in the 2016-2017 reporting period.

5.2 Rehabilitation of Disturbed Land

During the 2015-16 reporting period, rehabilitation works were not undertaken due to lower production profile in the reporting period meaning less coarse reject was generated. Site stabilisation works undertaken at the Kitchener SIS from November 2014 to February 2015 with the aim of stabilising the areas not required for operational purposes entered a monitoring phase during the 2015-2016 reporting period.

Other rehabilitation works undertaken included spreading mulch, constructing rock lined drains, installing fencing and constructing roads and parking areas.

5.3 Other Infrastructure

No rehabilitation activities other than the works outlined in **Section 5.2** were carried out during the 2015-2016 reporting period.

5.4 Rehabilitation Trials and Research

The majority of rehabilitation to be undertaken in the future will principally involve reshaping of disturbed areas once demolition works and rubbish removal has been completed and establishment of a stable vegetative cover in these areas. Methods for these rehabilitation works are well understood and require no further investigation.

The Aberdare Extended Reject Emplacement Area will be the first coarse reject emplacement area to be rehabilitated and will be used to refine emplacement and rehabilitation requirements at the East Open Cut and West Open Cut reject emplacement areas. All of these areas have been selected as they directly drain to former underground workings providing a suitable long term control for acidic leachate from the emplaced reject.

Aberdare Extended Reject Emplacement Area is to be rehabilitated as future open space (grassland) under agreement with the private landholder. Trials that may be conducted in the Aberdare Emplacement Area will include:

- growth medium establishment trials over the shaped landform (e.g. topsoil or organic amendments); and
- establishing a stable grass cover species over the reshaped landform.

These works will be undertaken on an ongoing basis over the Mining Operations Plan period.

Further research to be undertaken in the 2016-2017 period will include:

- an evaluation (e.g. soil analysis) of previously remediated acidic areas on site to determine whether further treatment is required. This information is to assist in determining the level of acid treatment required for other areas on site;
- the extent of acid amelioration requirements over areas to be rehabilitated during the MOP term (e.g. lime application rates);
- investigation of mechanisms for controlling the drainage of acid leachate from the emplacement areas to underground workings;
- A geotechnical study of the coarse reject material to further understand its chemical and physical characteristics:
    - The study will include an assessment of reject material from both the Aberdare and the East Pit Emplacement Areas. The study aim to determine spontaneous combustion and bushfire propensity and risks related to acid leachate.
    - Based on the outcomes of the study, Austar will determine the suitability of a minimum capping thickness, with any proposed changes to the capping strategy implemented by June 2017. Future MOP and Annual Review documents will detail the results of this assessment.

Table 5-1 summarises the areas which require rehabilitation at Austar Coal Mine and **Table 5-2** rehabilitation maintenance requirements.

The mining and rehabilitation status is presented in **Table 5-1**. Rehabilitation activities at Aberdare Emplacement Area are shown on **Plan 3B**. The increase to Total Mine Footprint / Active Disturbance areas are due to infrastructure associated with Tailings Boreholes shown on **Plan 3D**.

TABLE 5-1 REHABILITATION SUMMARY

Mine Area Type	Previous Reporting Period (2014-2015)	This Reporting Period (2015-2016)	Next Reporting Period (2016-2017)
Total Mine Footprint	181.1	181.1	181.6
Total Active Disturbance	137.08	137.08	135.82
Land being Prepared for Rehabilitation	0	0	0.0
Land under active Rehabilitation	44.1	44.1	45.8
Completed Rehabilitation	0	0	0

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 DRE 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 DRE 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 DRE 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 DRE that the area has successfully met the rehabilitation land use objectives and completion criteria.*

TABLE 5-2 MAINTENANCE ACTIVITIES ON REHABILITATED LAND

	Area Treated (ha)		
Nature of Treatment	**Report Period**	**Next Period**	**Comment/Control Strategies/Treatment Detail**
Additional erosion control works (drains re-contouring, rock protection)	0.5	1.0	Rock-lined drains constructed at Kitchener SIS to be constructed during 2016-2017 reporting period. Establishment of clean water diversion drains at Aberdare in next reporting period.
Re-covering (topsoil, subsoil)	0	0	Nil
Soil treatment	0	0	Nil
Pasture management	0	0	Nil
Reseeding/replanting	0	4.0	Potential additional seeding at Kitchener SIS
Adversely affected by weeds	0	5.0	Weed management and control to occur in next reporting period.
Feral animal control	0	0	Nil

5.5 Further Development of the Final Rehabilitation Plan

Austar's project approval PA08_0111 is valid until 31 December 2030. Final rehabilitation remains as proposed in the current MOP.

6 ACTIVITIES PROPOSED FOR THE NEXT AEMR PERIOD

Austar will endeavour to carry out the following activities during the 2016-2017 reporting period, as outlined in **Table 6-1**.

TABLE 6-1 PROPOSED ACTIVITIES FOR 2016-2017 REPORTING PERIOD

	Activities Proposed in 2016-2017 Reporting Period
1	Continued emplacement of coarse reject at Aberdare Extended Emplacement Area.
2	A study of the coarse reject material to further understand its chemical and physical characteristics with the aim to determine spontaneous combustion and bushfire propensity and risks related to acid leachate, and based on the outcomes of the study, Austar will determine the suitability of a minimum capping thickness.
3	Completion of Phase 1 Contamination Assessment for all Surface Mining Lease areas.
4	Establishment of additional tailings boreholes as described in the MOP.
5	Progress assessments to support demolition of existing structures and foundations at Bellbird, Pelton, and Cessnock No. 1 (Kalingo) Collieries.
6	Continued implementation of noise pollution reduction program at the Austar CHPP.
7	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 installation of the clean water diversion drain.
8	Investigation of mechanisms for controlling the drainage of acid leachate from the emplacement areas to underground workings;

Plans

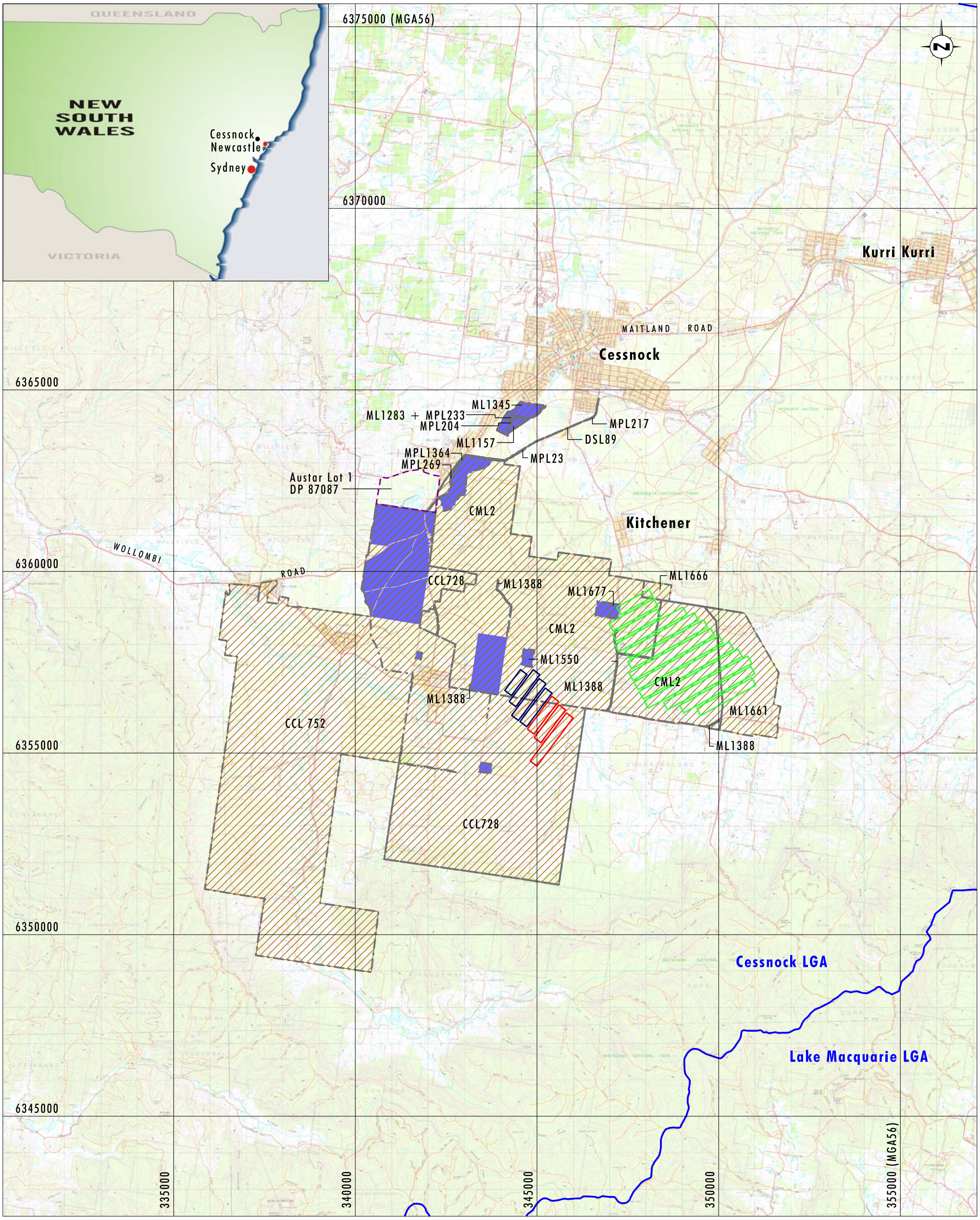


Image Source: Department of Land (2006)
Data Source: Austar Coal Mine (2015)

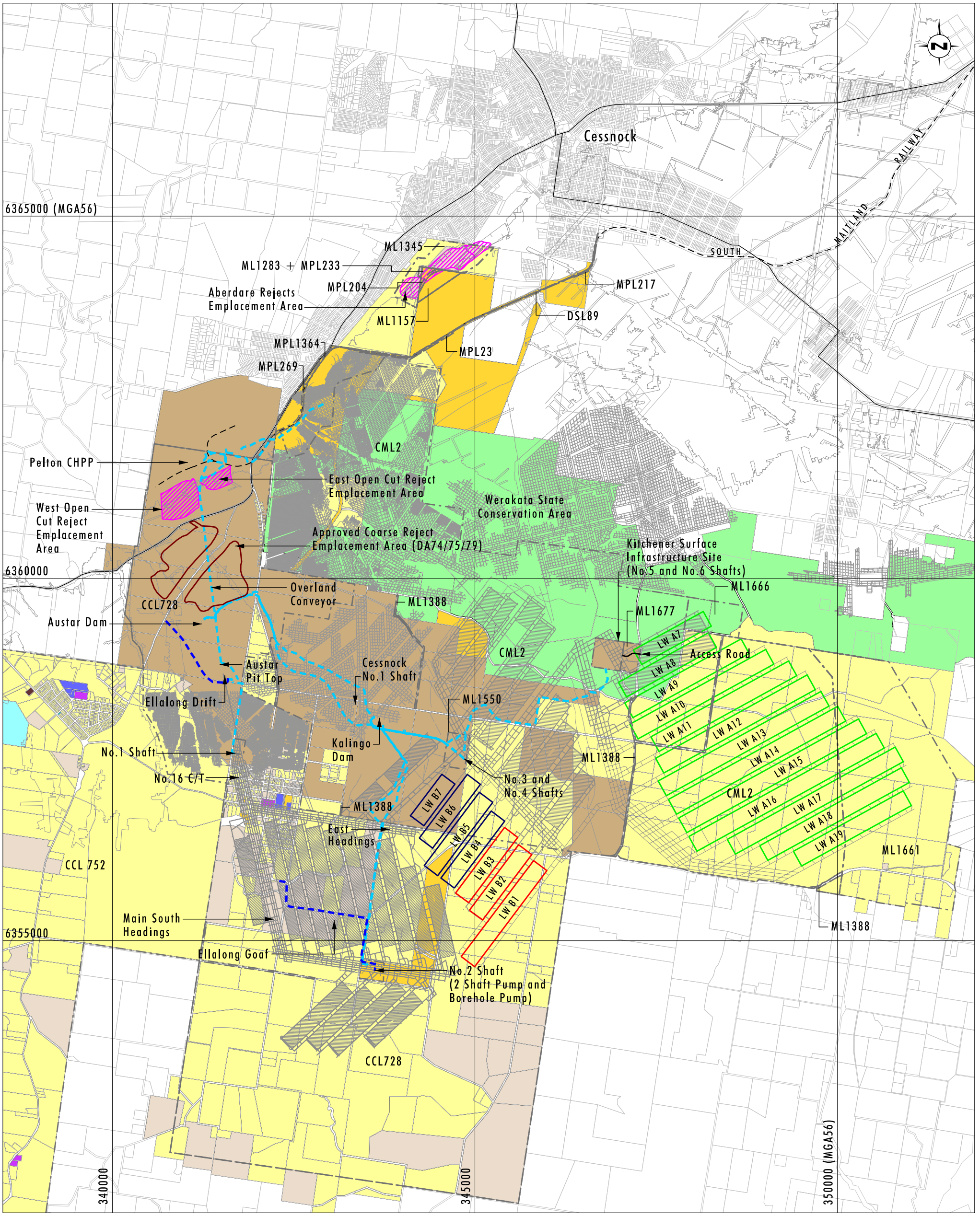
Legend

- Local Government Area Boundary
- Mining Lease Boundary
- Bellbird South B1-B3 Longwall Panels (DA29/95 MOD6)
- Proposed B4-B7 Longwall Panels
- Layout for Stage 3 Longwall Panels (PA08_0111 MOD3)
- Surface Lease
- Sub Surface Lease
- Austar Lot 1, DP 87087

File Name (A3): 3504_068.dgn

PLAN 1A

Project Locality



Data Source: Austar Coal Mine (2015)

0 1.0 2.0 2.5km

1:50 000 (at A3)

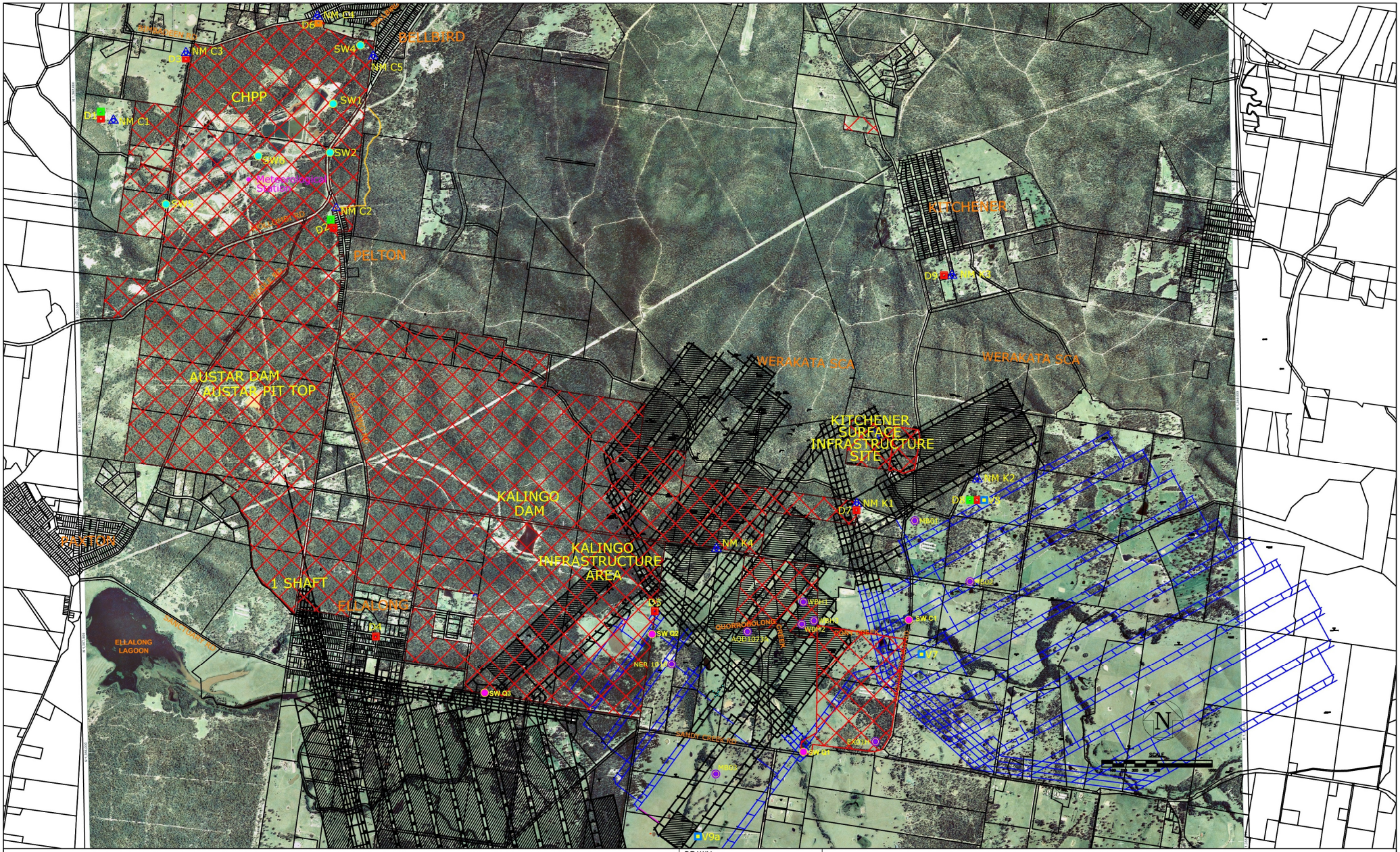
Legend

- Bellbird South B1-B3 Longwall Panels (DA29/95 MOD6)
- Proposed B4-B7 Longwall Panels
- Layout for Stage 3 Longwall Panels (PA08_0111 MOD3)
- Approved Coarse Reject Emplacement Area (DA74/75/79)
- Reject Emplacement Areas
- Previously Mined Land/First Workings
- Mining Lease Boundary
- Water Pipeline
- Water Pipeline - Potable
- State Conservation Area
- Australian Communications Commission
- Austar Coal Mine Land
- Cessnock City Council
- Crown Land
- Energy Australia
- Hunter Water
- Minister for Education
- Private Land
- Assumed Freehold Land

PLAN 1C

Mining Activity Areas and Built Environment

File Name (A3): 3504_069.dgn



NER 1010 ..... Ground Water Monitor

NM K1 ..... Noise Monitors

V7 ..... Vibration Monitors

Austar Owned Land

D8 ..... High Volume Air Sampler / Dust Gauge

D6 ..... Continuous Dust Monitor

SW 2 ..... Surface Water EPL Sample Points

SW C1 ..... Coney Creek Sample Points

SW Q1 ..... Quorrobolong Creek Sample Points

DRAWN	G. Mulhearn
DATE	29/9/2016
CHECKED	
APPROVED	

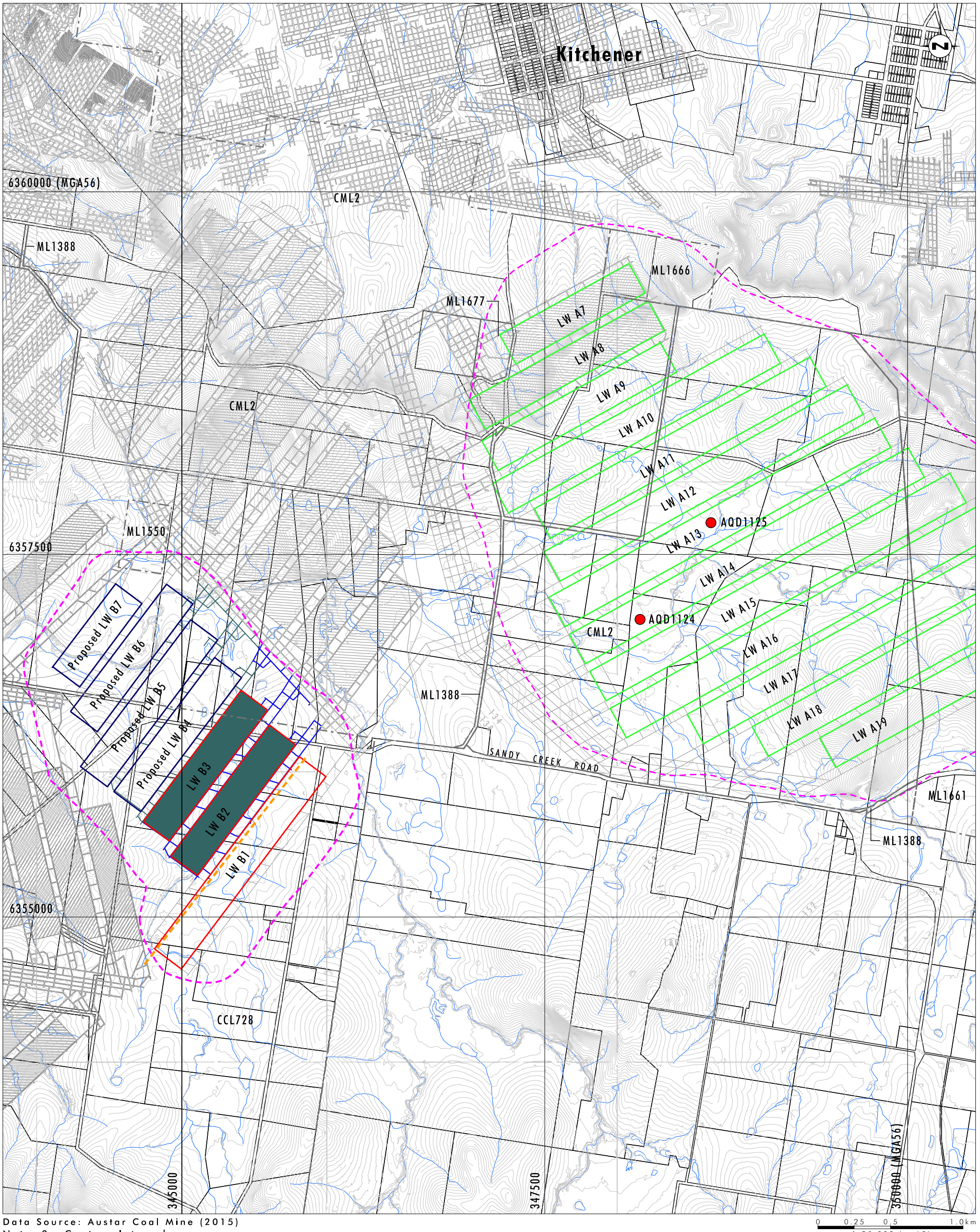
AUSTAR COAL MINE

TITLE

Plan 2: Austar Environmental Monitoring Network

SCALE	DRAWING No.	
Not to scale	Environmental/ Monitoring Plan	A3

umwelt



Data Source: Austar Coal Mine (2015)
Note: 2m Contour Interval

0 0.25 0.5 1.0km
1:25 000 (at A3)

Legend

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

Exploration 2015-2016:
- Borehole
- Seismic Line

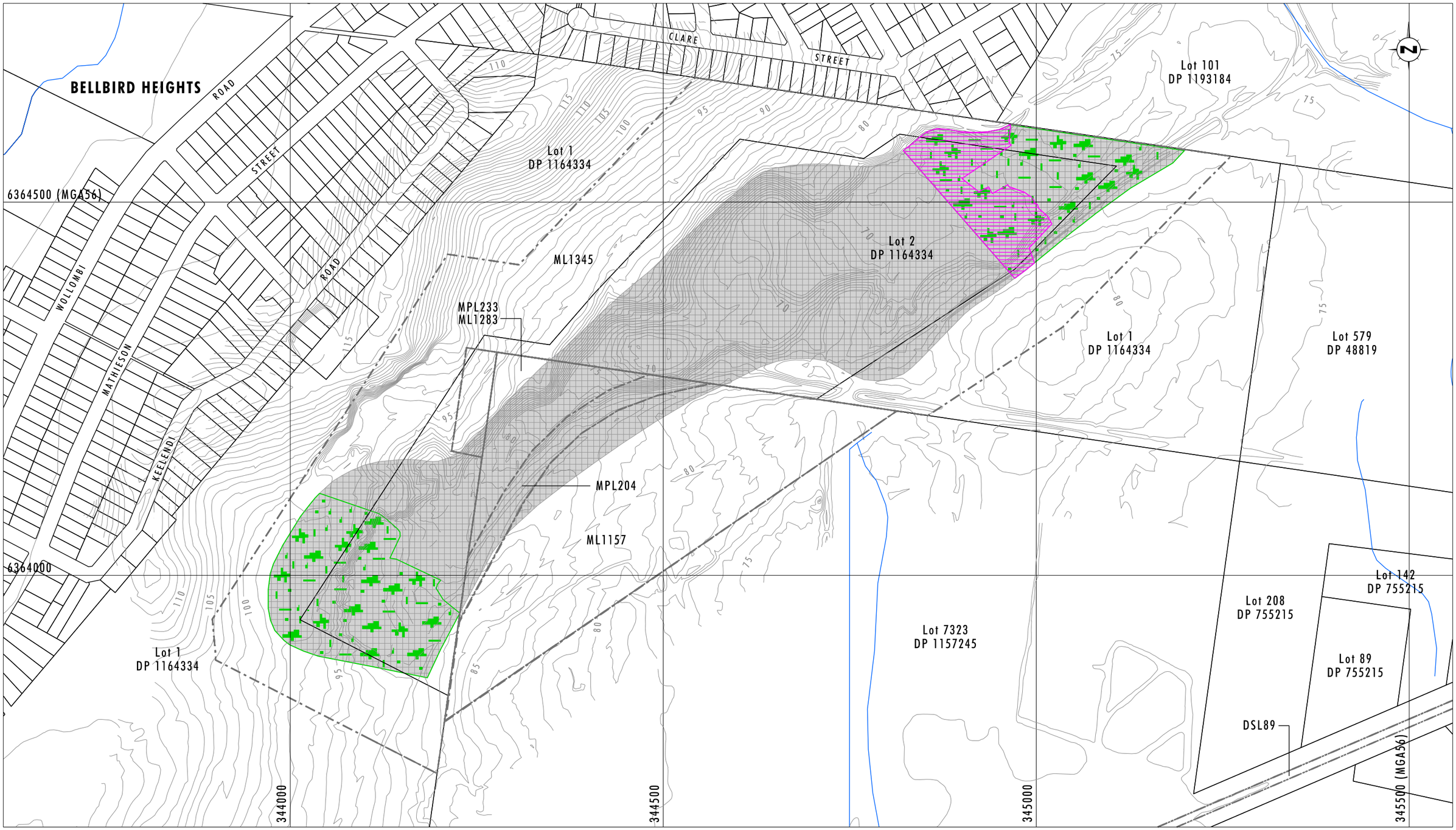
Mining Activities:
- Jul 2015 - June 2016
- Jul 2016 - June 2017

PLAN 3A

Mining Activities

File Name (A3): 3504_070.dgn

umwelt



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

Legend

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

Primary Domain
- 2 - Reject Emplacement Area

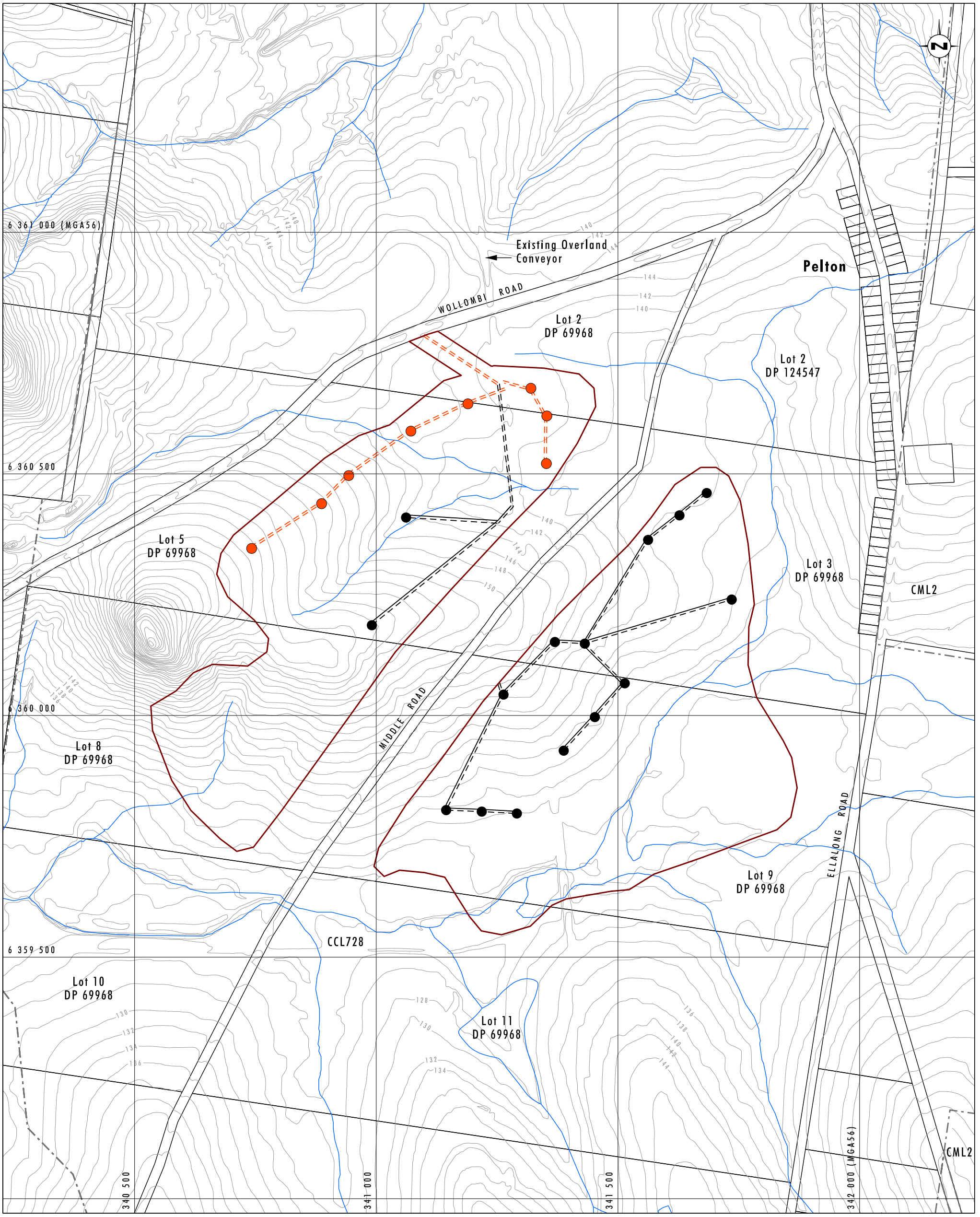
Secondary Domains
- Rehabilitation Area - Grassland

- Stage Plan Jul 2016 - Jun 2017

PLAN 3B

Aberdare Extended Emplacement Area Mining and Rehabilitation 30 June 2016

File Name (A3): 3504_071.dgn



Data Source: LPI (2009)
Note: 2m Contour Interval

Legend

- Approved Coarse Reject Emplacement Area (DA74/75/79)
- Stage Plan 2016 - 2017
- Mining Lease Boundary
- Proposed Borehole
- Proposed Access Track/Tailings Pipeline
- Drainage Line
- Contour Line

PLAN 3D

Tailings Boreholes Area Mining and Rehabilitation

File Name (A3): 3504_072.dgn
20160929 11.09

Appendix A:

Dust Monitoring Data

Austar Coal Mine 2015-2016 Dust Deposition Gauge Results (g/m²/month)

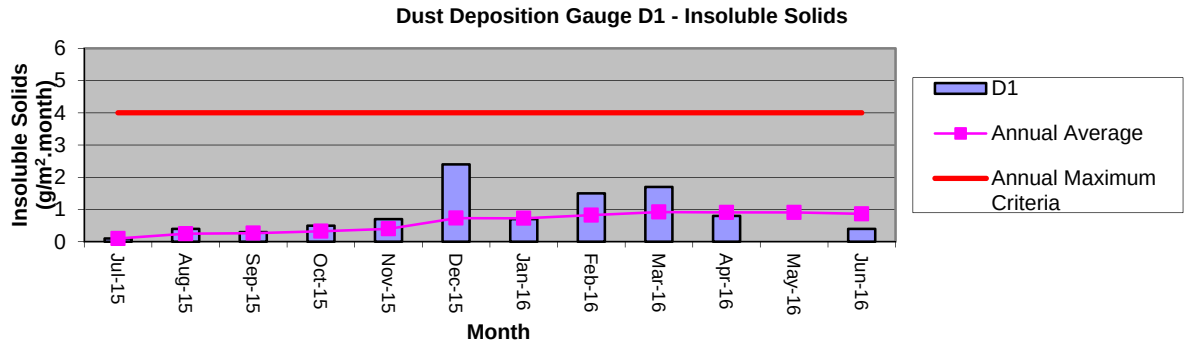
Month	D1			D2			D3			D4			D5			D7			D8			D9			Annual Maximum Criteria
	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	
Jul-15	0.1	0.1	<0.1	0.6	0.6	0.4	0.2	0.2	0.1	3.5	3.5	1.9	1	1.0	0.4	0.5	0.5	0.2	0.2	0.2	0.1	0.2	0.2	<0.1	0.1
Aug-15	0.4	0.3	0.3	0.6	0.6	0.5	0.4	0.3	0.3	5.2c	3.5	3.9c	11c	1.0	7.7c	0.8	0.7	0.3	0.1	0.2	0.1	0.2	0.2	0.1	0.4
Sep-15	0.3	0.3	0.2	0.7	0.6	0.4	0.7	0.4	0.5	5.9c	3.5	3.6c	3.8c	1.0	2.2c	0.5	0.6	0.3	0.6	0.3	0.3	0.5	0.3	0.3	0.3
Oct-15	0.5	0.3	0.2	0.8	0.7	0.4	2.7c	0.4	1.3c	2.8c	3.5	1c	9.3c	1.0	6.1c	0.4	0.6	0.2	0.4	0.3	0.2	0.3	0.3	0.2	0.5
Nov-15	0.7	0.4	0.4	5.8c	0.7	2.2c	1.4	0.7	0.7	3.2	3.4	2.2	**6**	3.5	4.5	1.8	0.8	0.9	0.9	0.4	0.4	2.9	0.8	2.4	0.7
Dec-15	2.4	0.7	1.1	5.5c	0.7	1.2	6.3c	0.7	1.2	**4.2**	3.6	2.5	6.8c	3.5	3.2	0.7	0.8	0.3	1	0.5	0.2	1.5	0.9	0.6	2.4
Jan-16	0.7	0.7	0.4	1.4	0.8	0.8	3.7c	0.7	1.2c	NA	3.6	NA	7c	3.5	3.6c	2.6	1.0	0.7	NS	0.5	NS	1.8	1.1	0.8	0.7
Feb-16	1.5	0.8	0.5	**4.3**	1.4	2.3	0.5	0.6	0.3	5.5c	3.6	1.5	2.9	3.3	1.2	0.7	1.0	0.2	0.8	0.6	0.2	0.9	1.0	0.5	1.5
Mar-16	1.7	0.9	0.2	0.7	1.3	0.4	0.9	0.7	0.4	5.6c	3.6	2	4.8c	3.3	1.7	0.8	1.0	0.3	0.9	0.6	0.4	0.7	1.0	0.3	1.7
Apr-16	0.8	0.9	0.5	1	1.3	0.4	2	0.9	0.7	2.7	3.4	1.7	5.2c	3.3	1.7	1.3	1.0	0.4	0.9	0.6	0.3	0.9	1.0	0.5	0.8
May-16	10.2 c	0.9	2	2.6	1.4	1.3	1.4	0.9	0.7	0.9	2.9	0.6	10.5 c	3.3	6.5	0.6	1.0	0.2	0.7	0.7	0.2	0.7	1.0	0.4	10.2 c
Jun-16	0.4	0.9	0.2	1.1	1.4	0.7	0.5	0.9	0.3	1.7	2.7	1	3.1	3.3	1.5	0.5	0.9	0.4	0.4	0.6	0.2	0.6	0.9	0.4	0.4

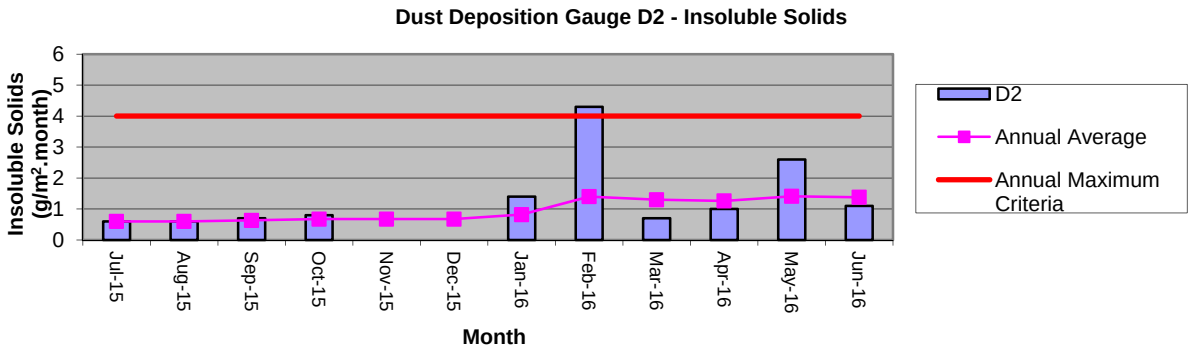
Note: *"c" denotes contaminated with bird droppings or similar. NS denotes sampling not undertaken. NA denotes sample not available as bottle was missing. Not used for Annual Average Calculations.*

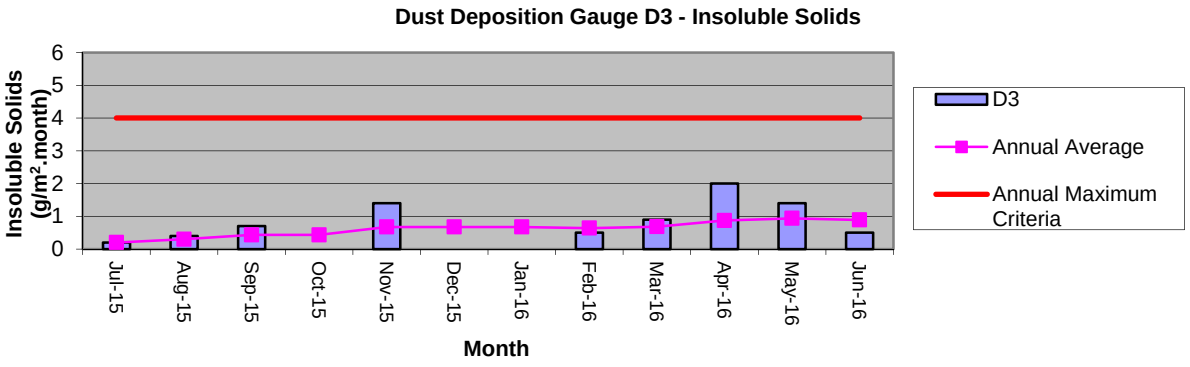
Individual monthly dust results and Annual Average dust results over the Annual Average Criteria of 4g/m² are highlighted in bold.

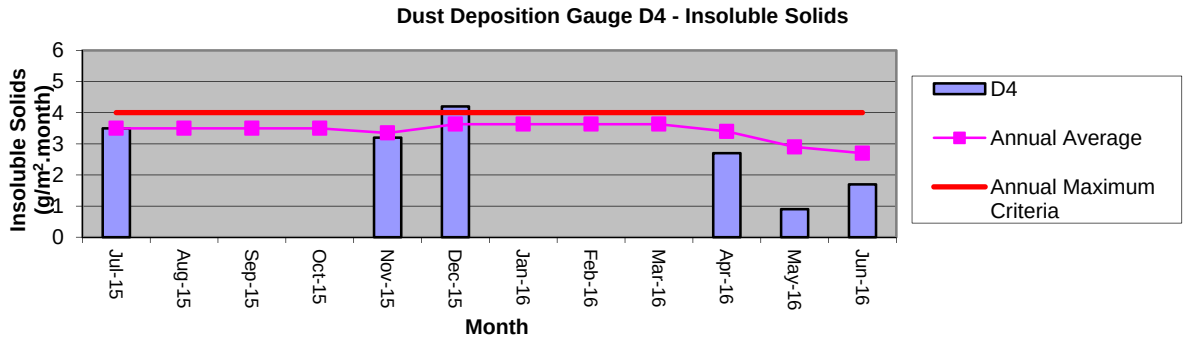
YTD denotes Year to Date.

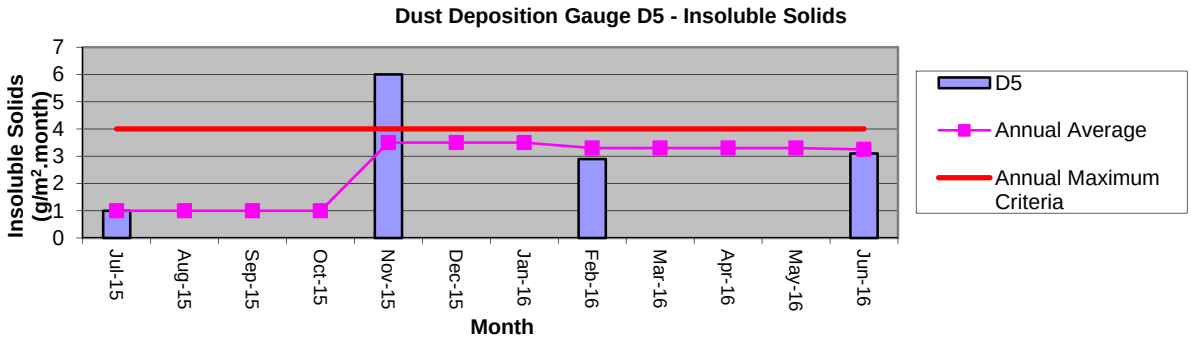
Austar Coal Mine 2015-2016 Dust Deposition Gauge Result Graphs

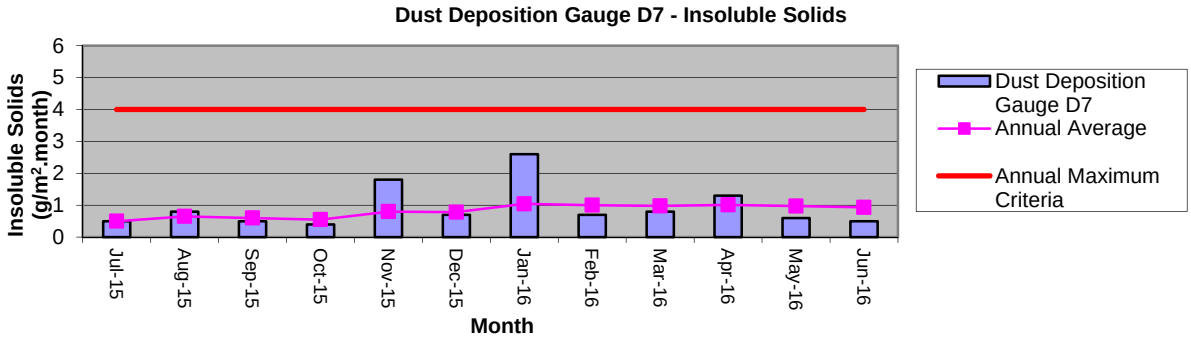


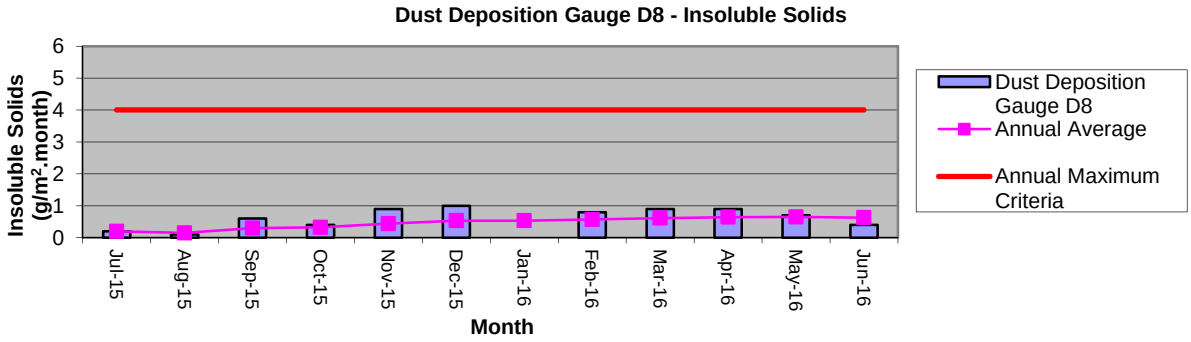


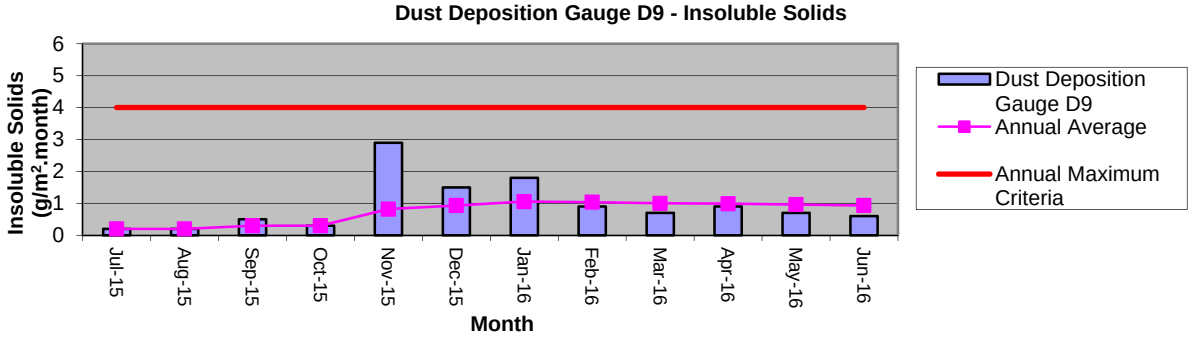












Note: Where dust gauge was contaminated (e.g. bird droppings), data is not presented.

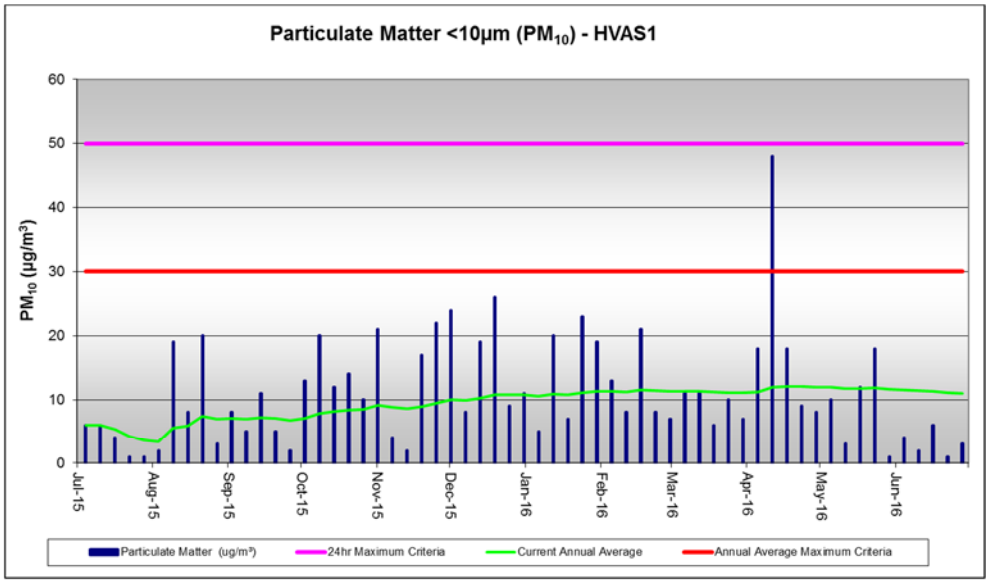
Austar Coal Mine 2015-2016 High Volume Air Sampler (HVAS) Results (PM_{10} µg/m^3)

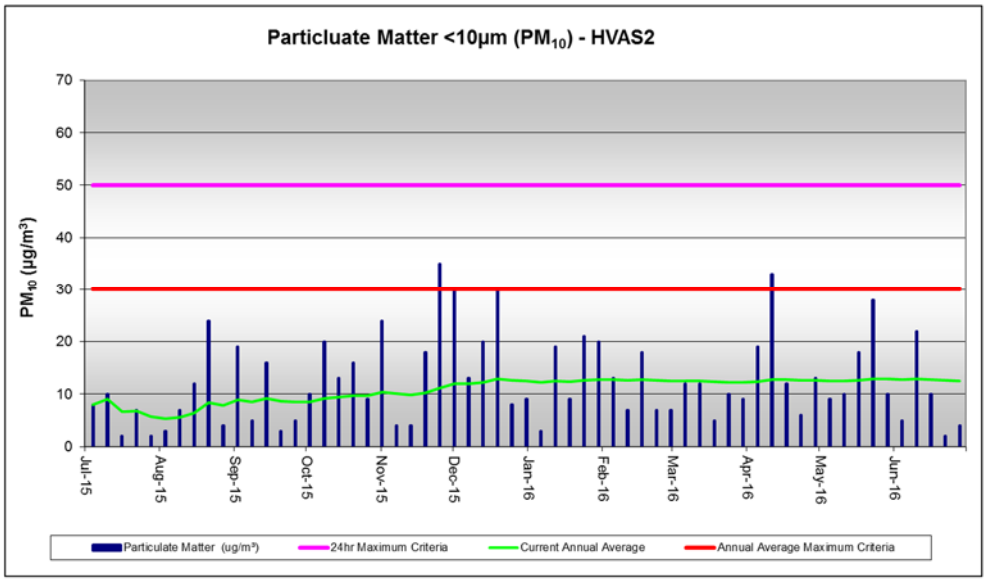
Date	Particulate Matter <10µm (PM_{10}) – HVAS1			Particulate Matter <10µm (PM_{10}) – HVAS2			Particulate Matter <10µm (PM_{10}) – HVAS3		
	Particulate Matter	Monthly Average	Current Annual Average YTD	Particulate Matter	Monthly Average	Current Annual Average YTD	Particulate Matter	Monthly Average	Current Annual Average YTD
4/07/2015	6		6.0	8		8.0	3		3.0
10/07/2015	6		6.0	10		9.0	4		3.5
16/07/2015	4		5.3	2		6.7	2		3.0
22/07/2015	1		4.3	7		6.8	4		3.3
28/07/2015	1	3.6	3.6	2	5.8	5.8	1	2.8	2.8
3/08/2015	2		3.3	3		5.3	3		2.8
9/08/2015	19		5.6	7		5.6	3		2.9
15/08/2015	8		5.9	12		6.4	11		3.9
21/08/2015	20		7.4	24		8.3	18		5.4
27/08/2015	3	10.4	7.0	4	10.0	7.9	4	7.8	5.3
2/09/2015	8		7.1	19		8.9	6		5.4
8/09/2015	5		6.9	5		8.6	4		5.3
14/09/2015	11		7.2	16		9.2	7		5.4
20/09/2015	5		7.1	3		8.7	4		5.3
26/09/2015	2	6.2	6.7	5	9.6	8.5	5	5.2	5.3
2/10/2015	13		7.1	10		8.6	9		5.5
8/10/2015	20		7.9	20		9.2	17		6.2
14/10/2015	12		8.1	13		9.4	11		6.4
20/10/2015	14		8.4	16		9.8	12		6.7
26/10/2015	10	13.8	8.5	9	13.6	9.8	8	11.4	6.8
1/11/2015	21		9.1	24		10.4	19		7.4
7/11/2015	4		8.9	4		10.1	2		7.1
13/11/2015	2		8.6	4		9.9	1		6.9
19/11/2015	17		8.9	18		10.2	21		7.5
25/11/2015	22	13.2	9.4	35	17.0	11.2	19	12.4	7.9
1/12/2015	24		10.0	30		11.9	23		8.5
7/12/2015	8		9.9	13		12.0	7		8.4
13/12/2015	19		10.3	20		12.3	20		8.9
19/12/2015	26		10.8	30		12.9	24		9.4
25/12/2015	9		10.7	8		12.7	6		9.3
31/12/2015	11	16.2	10.7	9	18.3	12.6	7	14.5	9.2
6/01/2016	5		10.6	3		12.3	3		9.0
12/01/2016	20		10.8	19		12.5	18		9.3
18/01/2016	7		10.7	9		12.4	9		9.3
24/01/2016	23		11.1	21		12.6	25		9.7
30/01/2016	19	14.8	11.3	20	14.4	12.8	18	14.6	9.9
5/02/2016	13		11.4	13		12.8	14		10.1
11/02/2016	8		11.3	7		12.7	8		10.0
17/02/2016	21		11.5	18		12.8	20		10.3
23/02/2016	8		11.4	7		12.7	5		10.1
29/02/2016	7	11.4	11.3	7	10.4	12.5	7	10.8	10.0
6/03/2016	11		11.3	12		12.5	11		10.1

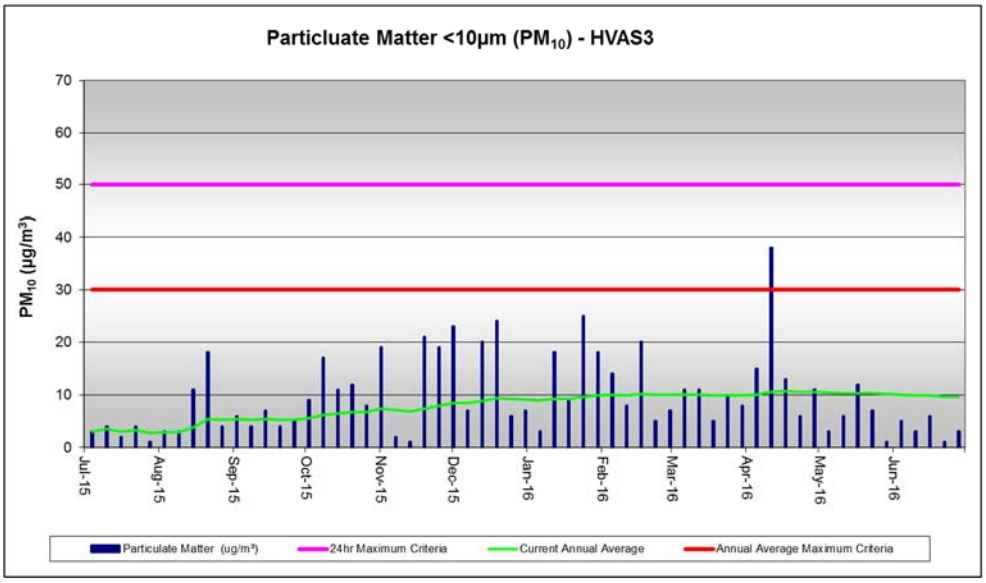
Date	Particulate Matter <10µm (PM_{10}) – HVAS1			Particulate Matter <10µm (PM_{10}) – HVAS2			Particulate Matter <10µm (PM_{10}) – HVAS3		
	Particulate Matter	Monthly Average	Current Annual Average YTD	Particulate Matter	Monthly Average	Current Annual Average YTD	Particulate Matter	Monthly Average	Current Annual Average YTD
12/03/2016	11		11.3	12		12.5	11		10.1
18/03/2016	6		11.2	5		12.3	5		10.0
24/03/2016	10		11.2	10		12.3	10		10.0
30/03/2016	7	9.0	11.1	9	9.6	12.2	8	9.0	9.9
5/04/2016	18		11.2	19		12.4	15		10.0
11/04/2016	48		12.0	33		12.8	38		10.6
17/04/2016	18		12.1	12		12.8	13		10.7
23/04/2016	9		12.0	6		12.6	6		10.6
29/04/2016	8	20.2	12.0	13	16.6	12.6	11	16.6	10.6
5/05/2016	10		11.9	9		12.6	3		10.4
11/05/2016	3		11.8	10		12.5	6		10.4
17/05/2016	12		11.8	18		12.6	12		10.4
23/05/2016	18		11.9	28		12.9	7		10.3
29/05/2016	1	8.8	11.7	10	15.0	12.9	1	5.8	10.2
4/06/2016	4		11.5	5		12.7	5		10.1
10/06/2016	2		11.4	22		12.9	3		9.9
16/06/2016	6		11.3	10		12.8	6		9.9
22/06/2016	1		11.1	2		12.7	1		9.7
28/06/2016	3	3.2	11.0	4	8.6	12.5	3	3.6	9.6

Note: *The annual average PM_{10} criterion is 30 µg/m^3. Annual average results greater than this figure are bold.*
The 24-hour average PM_{10} criterion is 50 µg/m^3. Results greater than this figure are bold.
YTD denotes year to date.

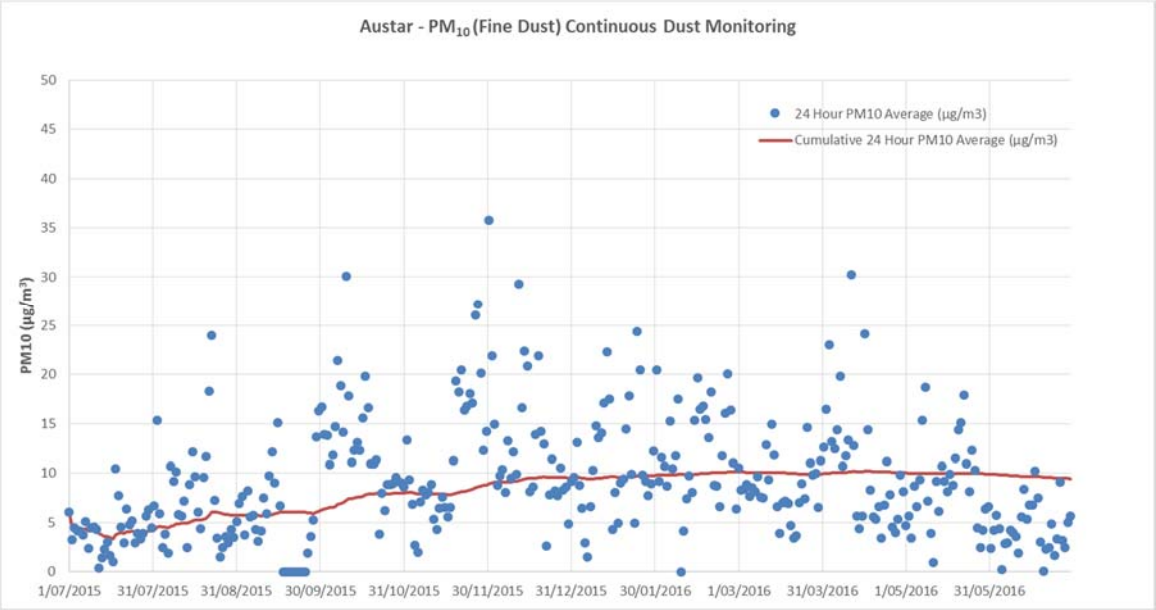
Austar Coal Mine 2015-2016 High Volume Air Sampler (HVAS) Results Graphs







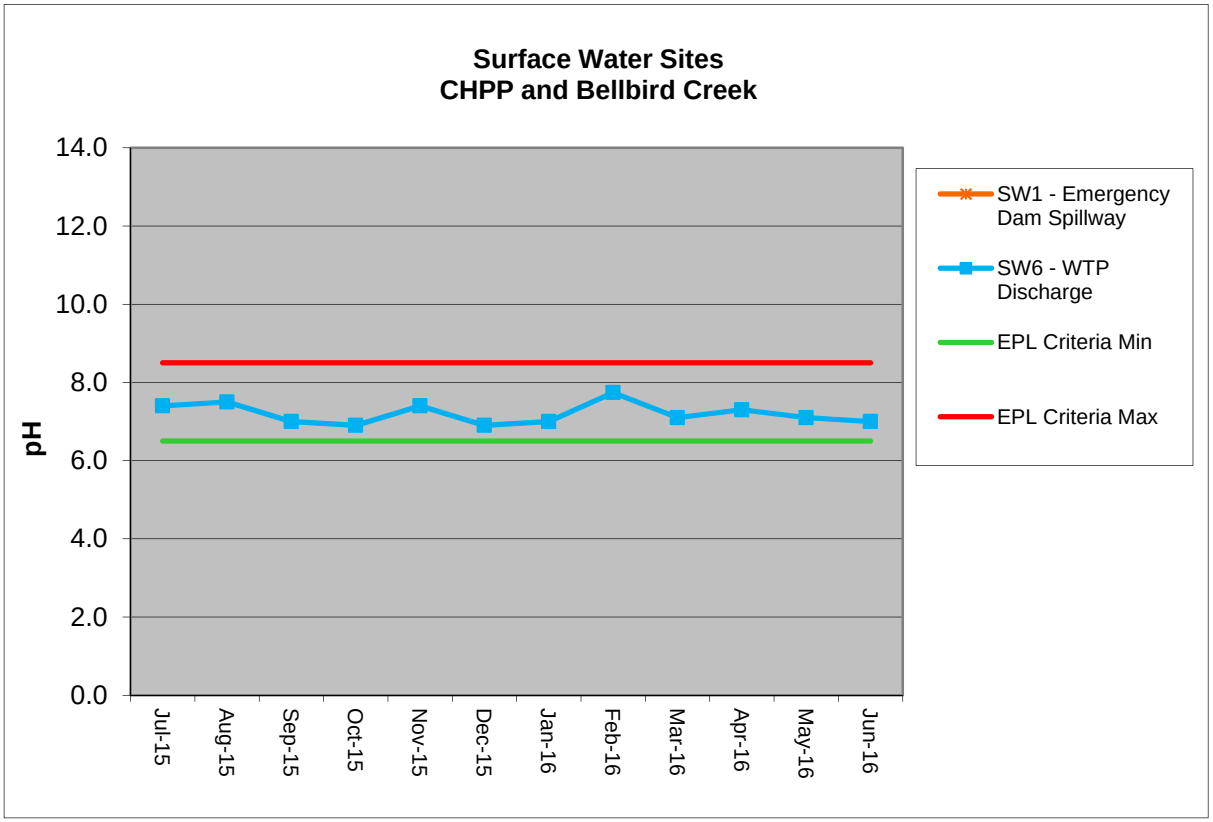
Austar Coal Mine 2015-2016 Continuous Dust Monitoring (TEOM) Results Graph

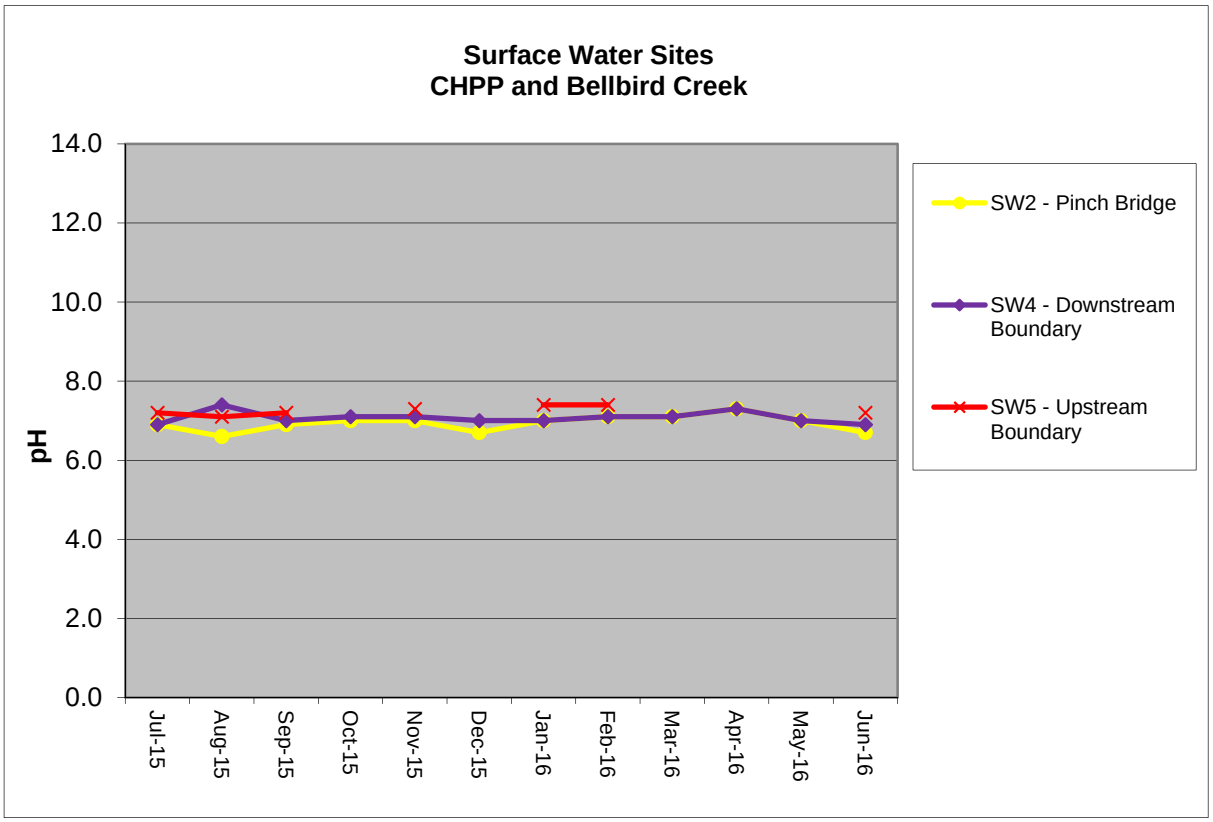


Appendix B:

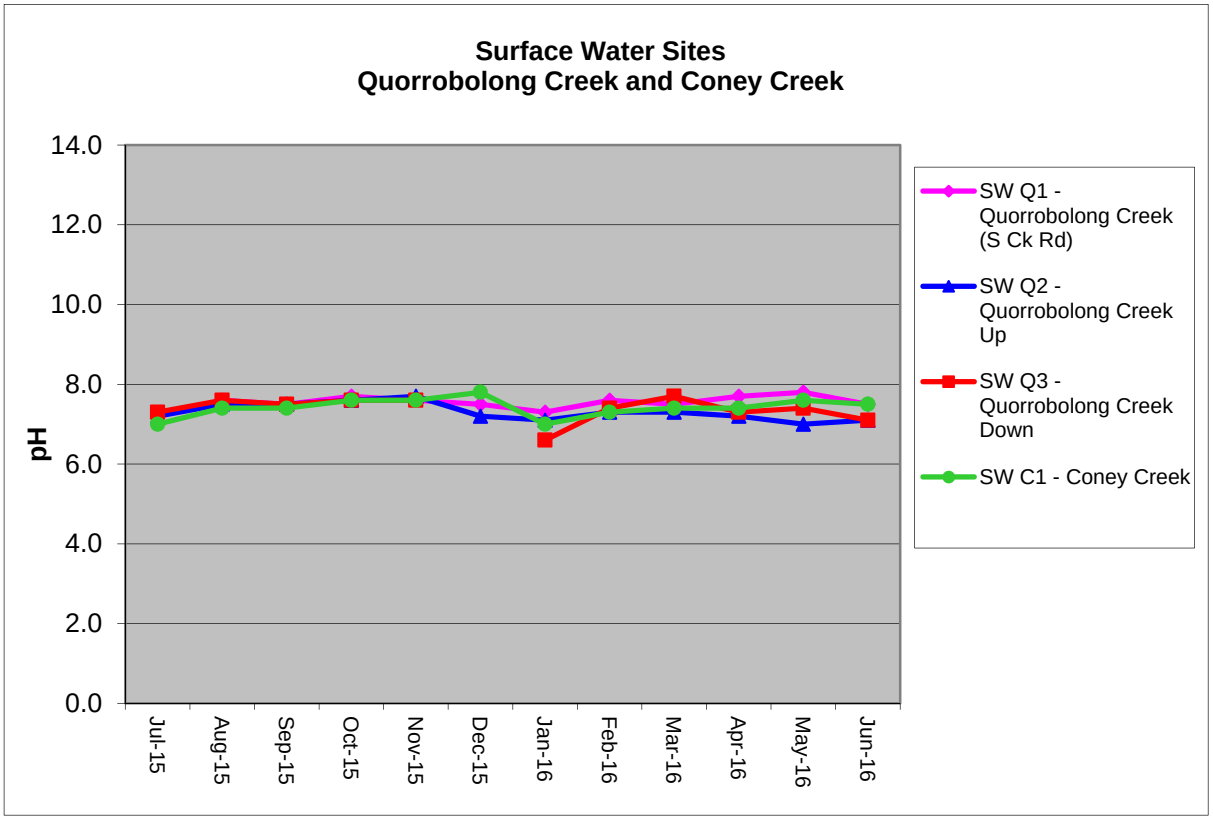
Water Quality Data

Austar Coal Mine 2015-2016 Surface Water Monitoring Results Graphs – pH



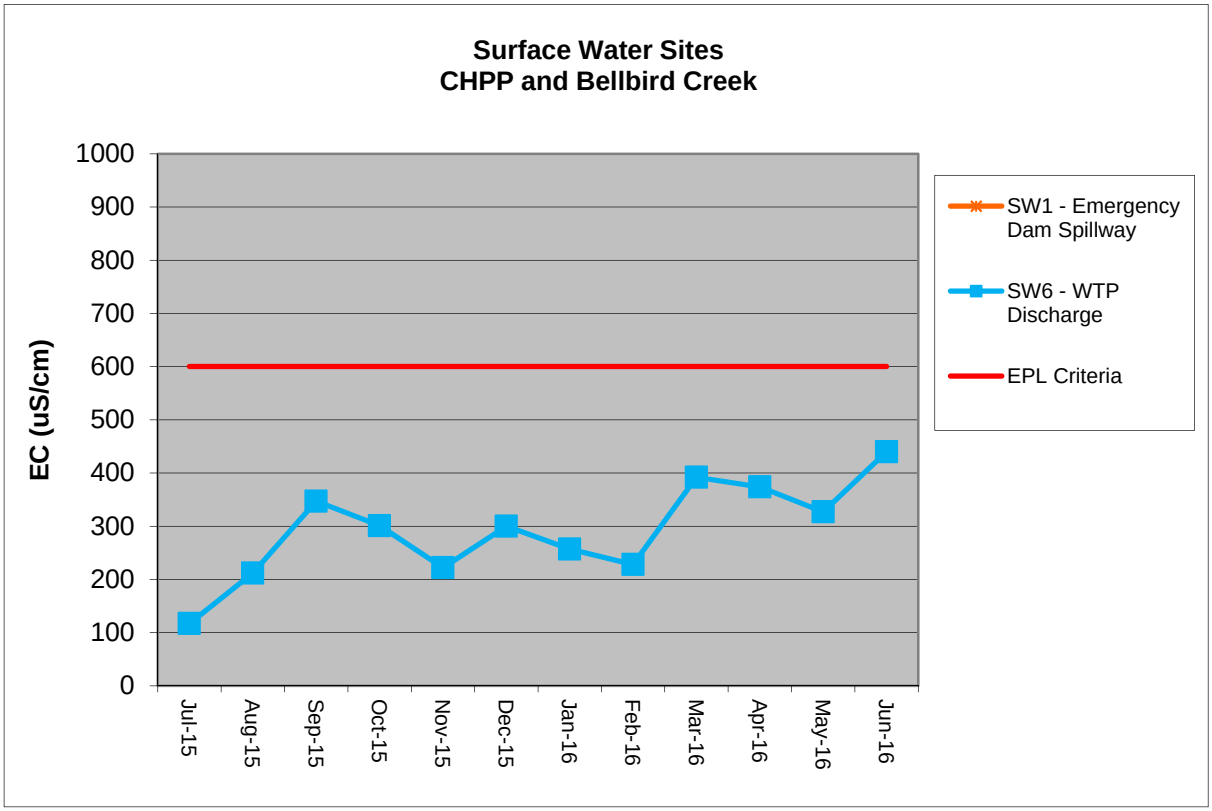


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

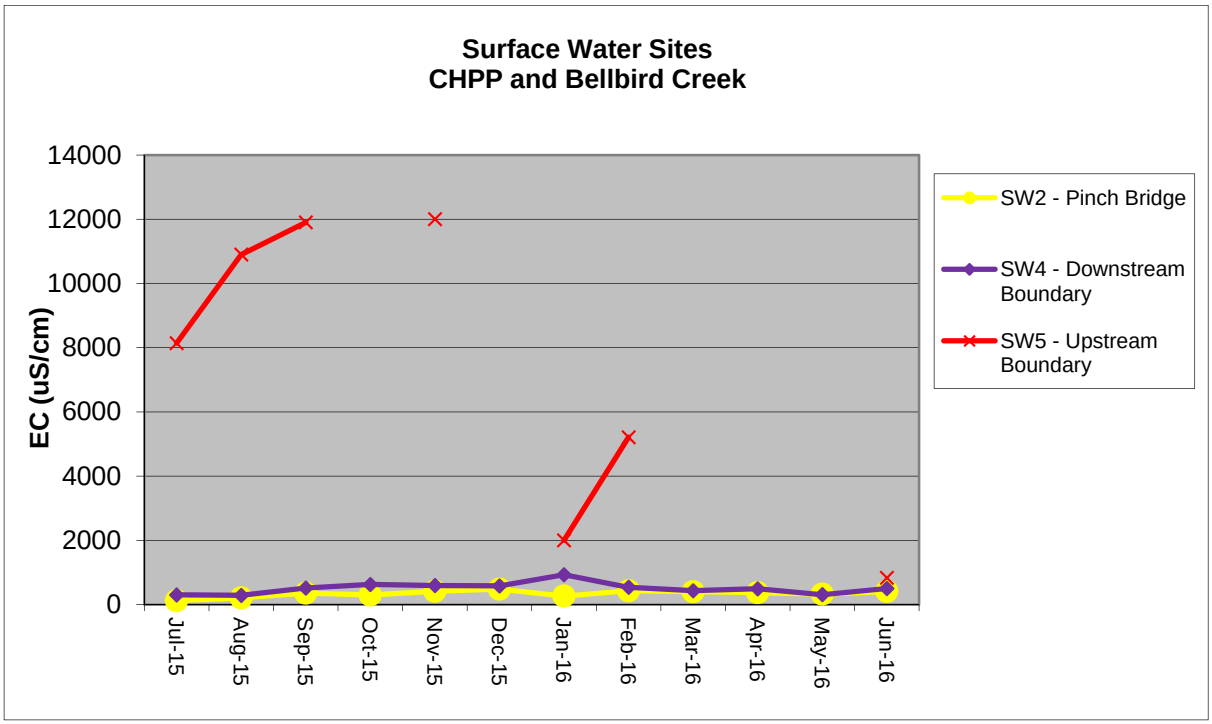


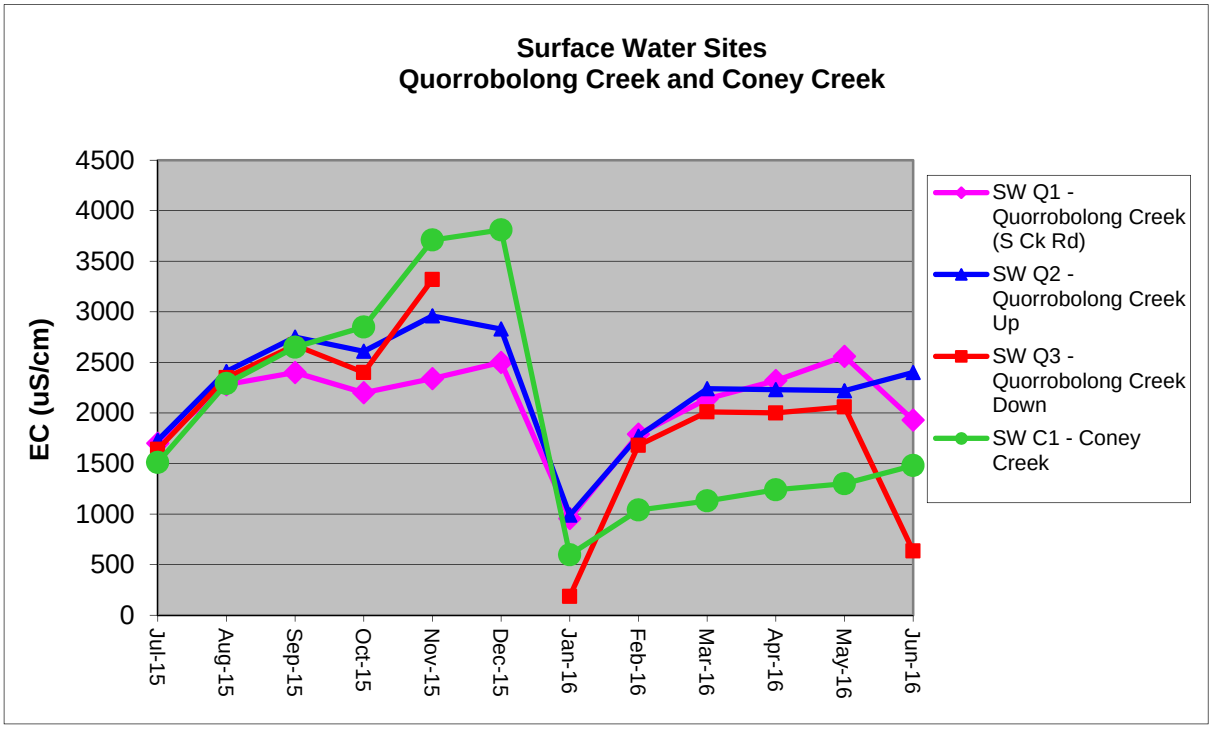
Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

Austar Coal Mine 2015-2016 Surface Water Monitoring Results Graphs – EC and TDS



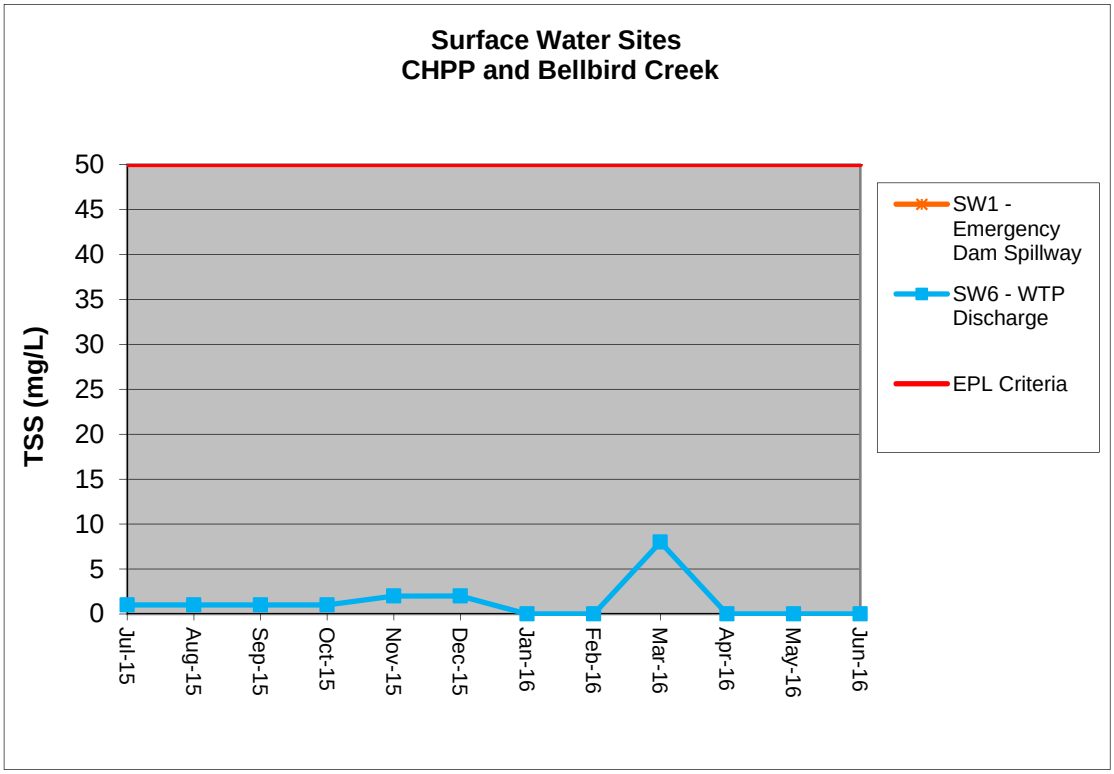
Note: No discharge occurred from SW1 in 2015-16 reporting period.



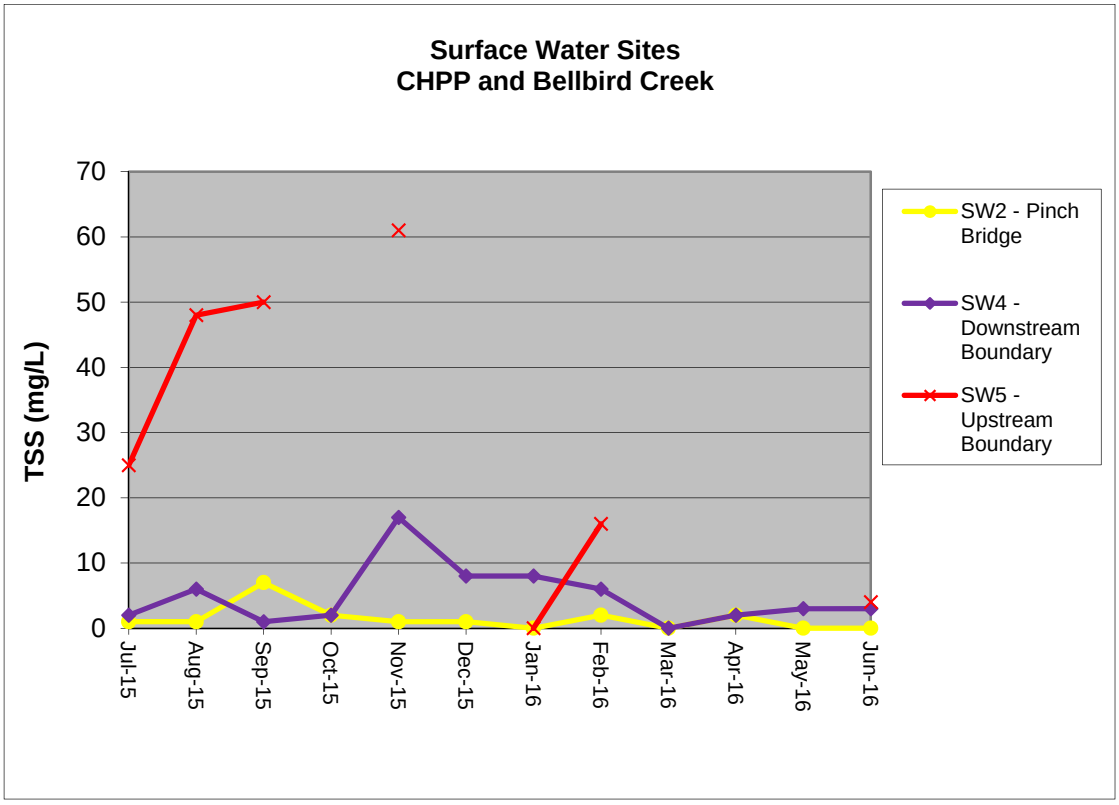


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

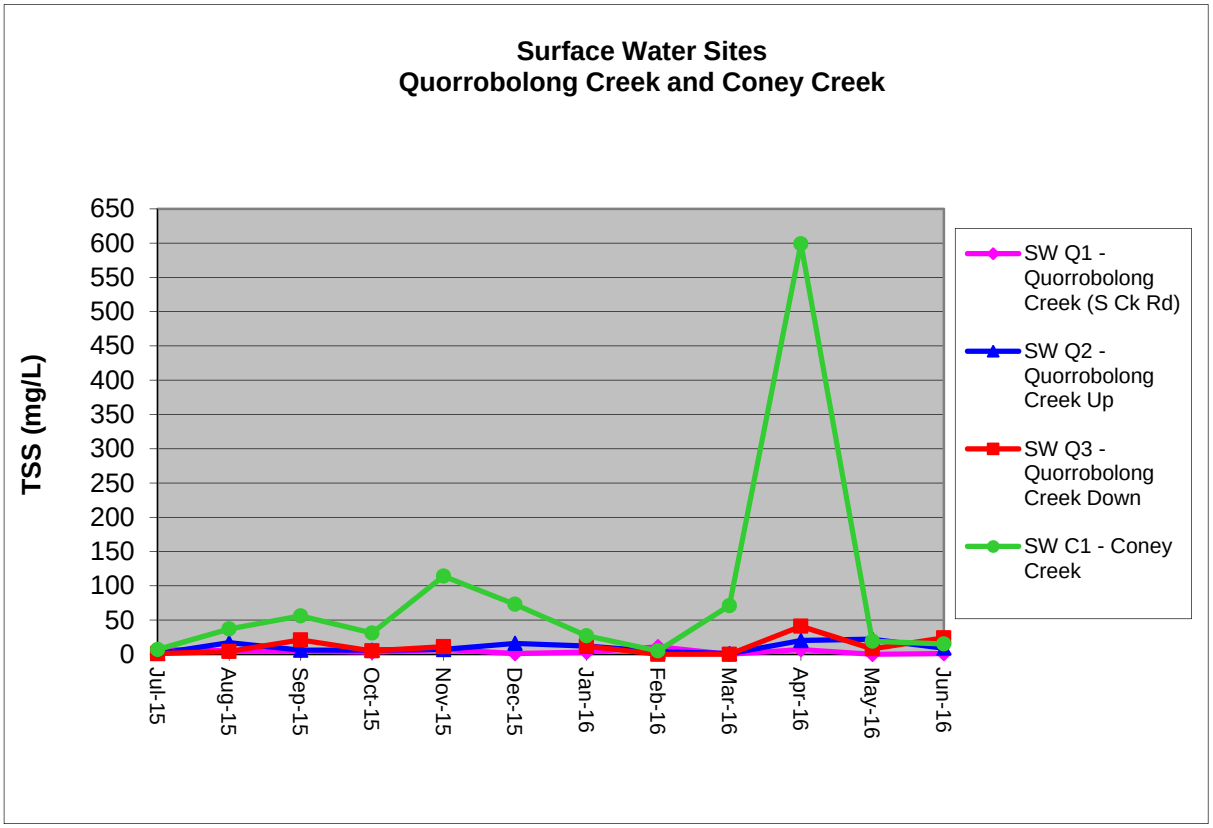
Austar Coal Mine 2015-2016 Surface Water Monitoring Results Graphs - TSS



Note: No discharge occurred from SW1 in 2015-16 reporting period.

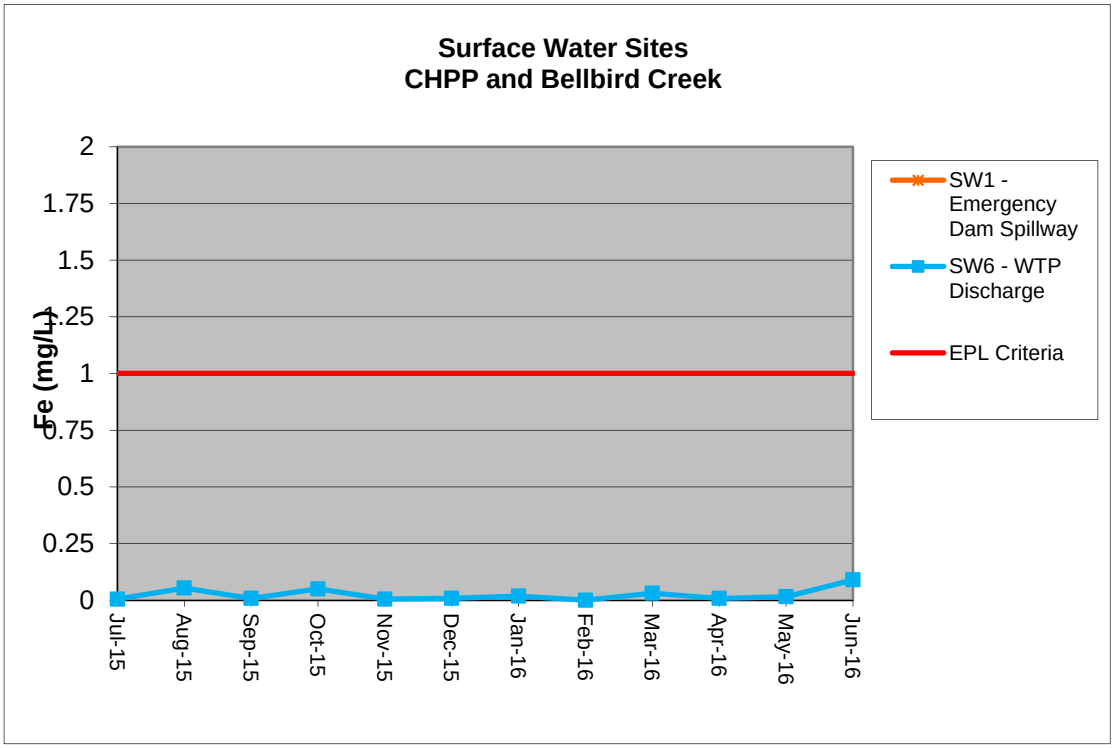


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

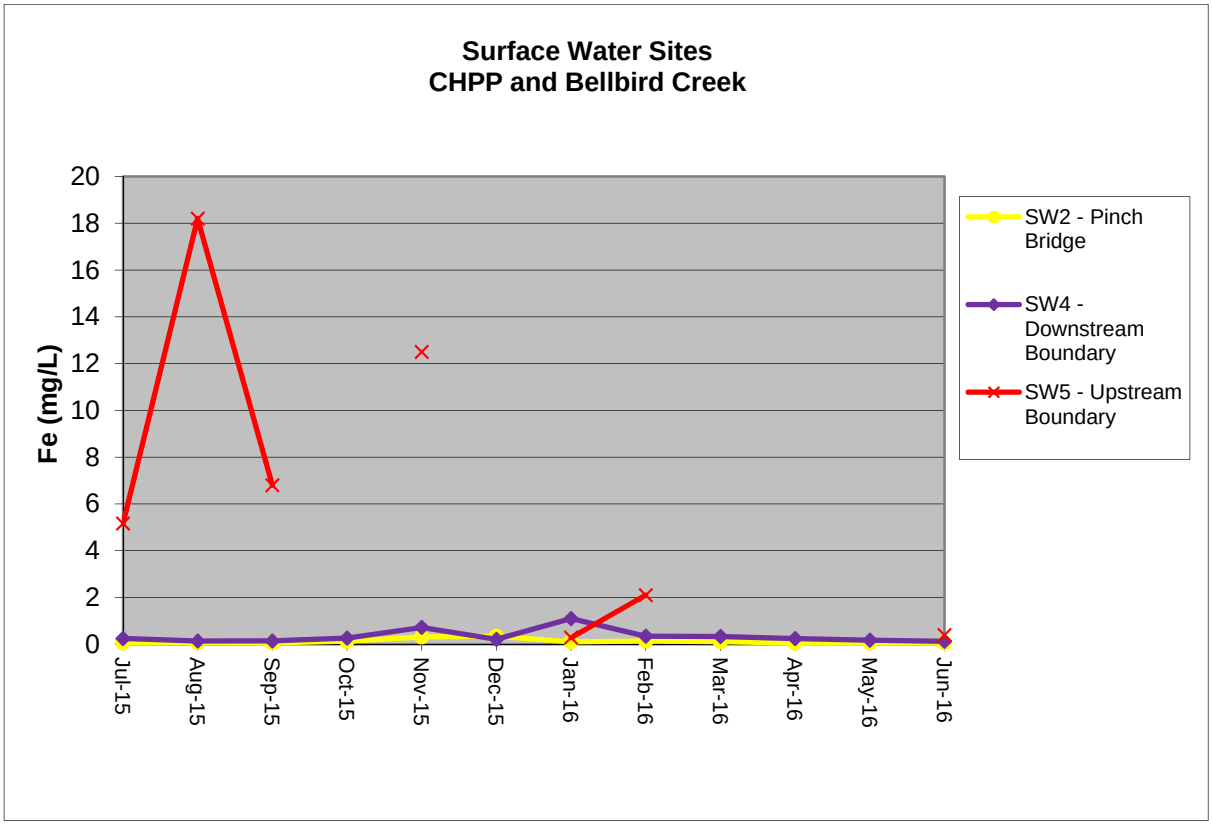


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

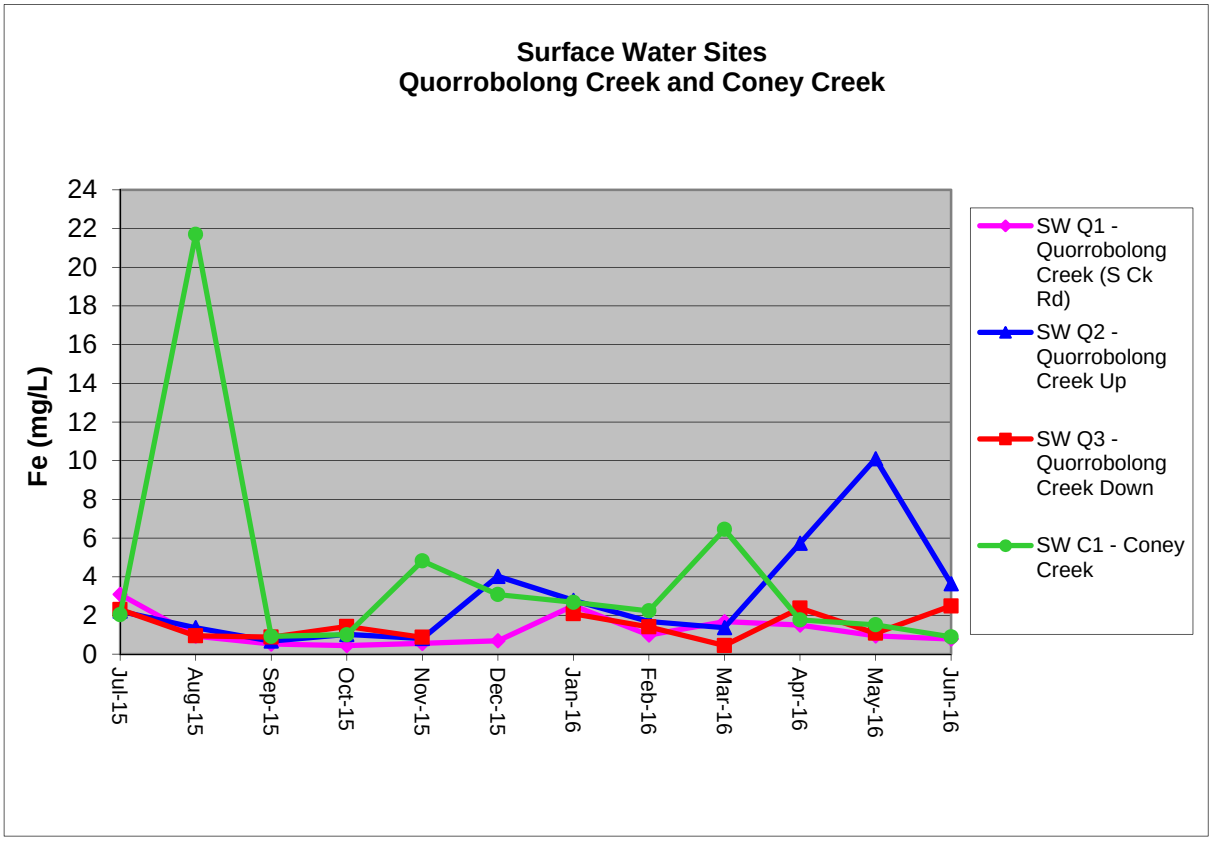
Austar Coal Mine 2015-2016 Surface Water Monitoring Results Graphs - Fe



Note: No discharge occurred from SW1 in 2015-16 reporting period.



Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

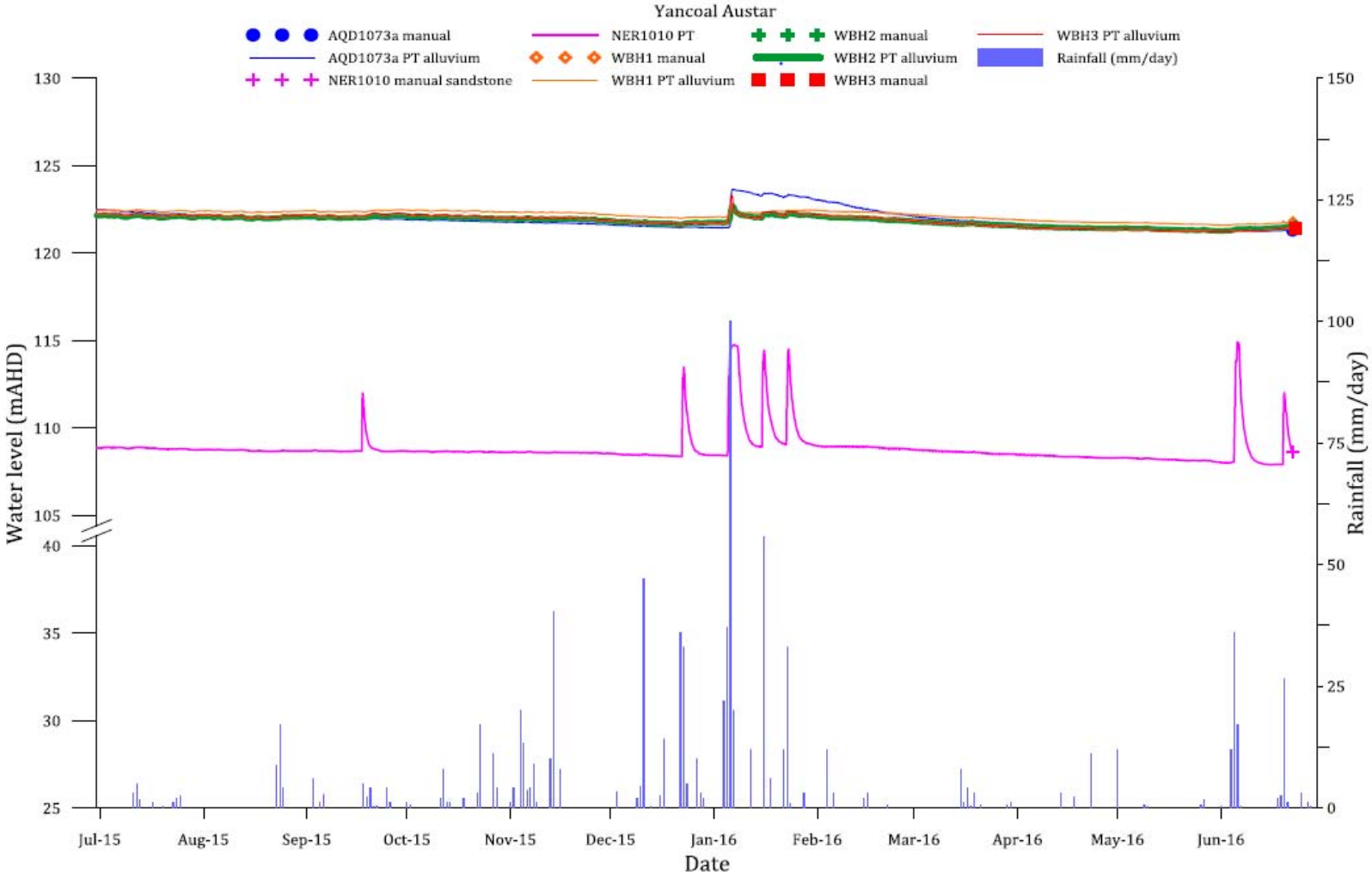


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

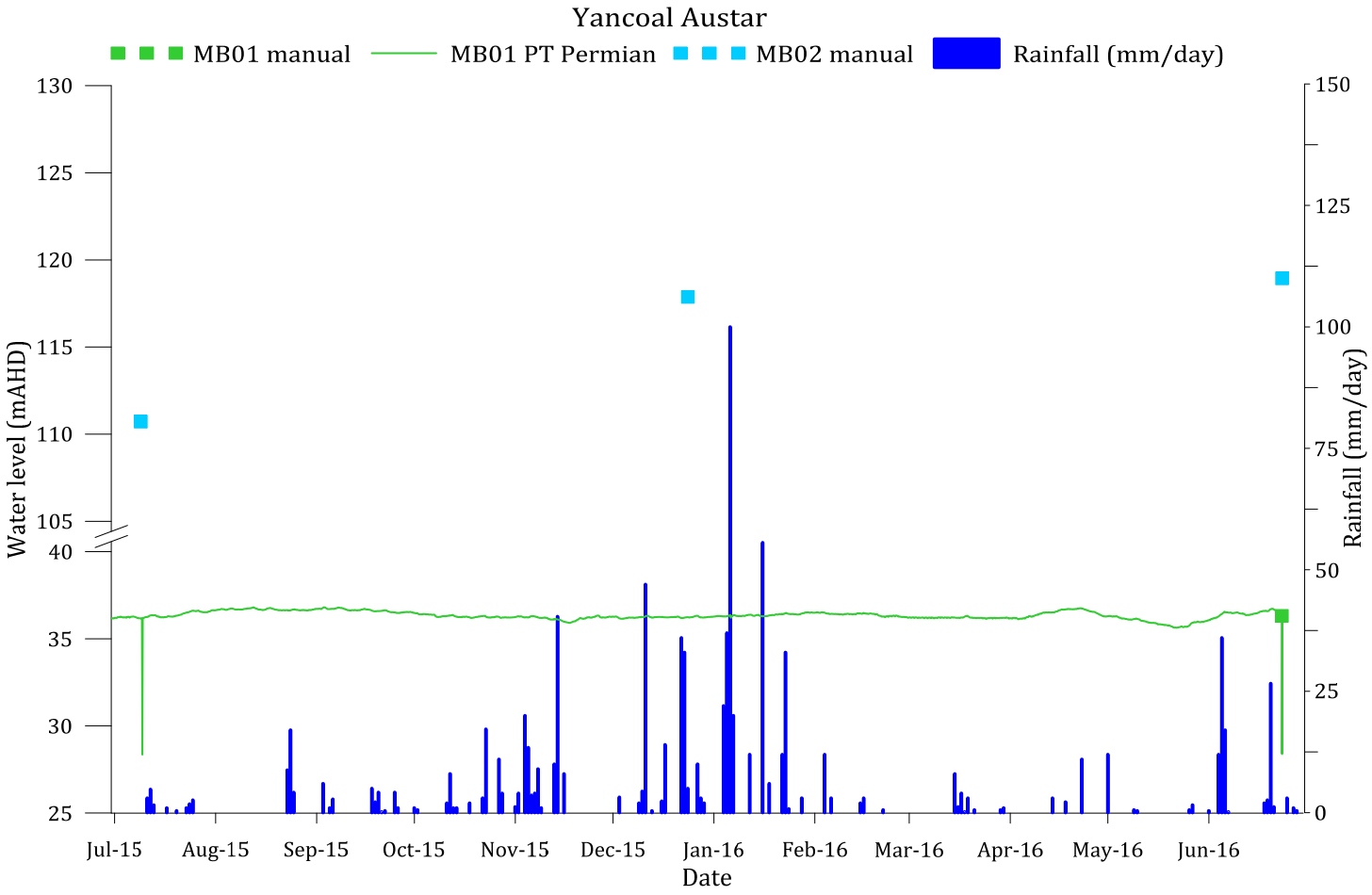
Appendix C:

Groundwater Level and Quality Monitoring Data

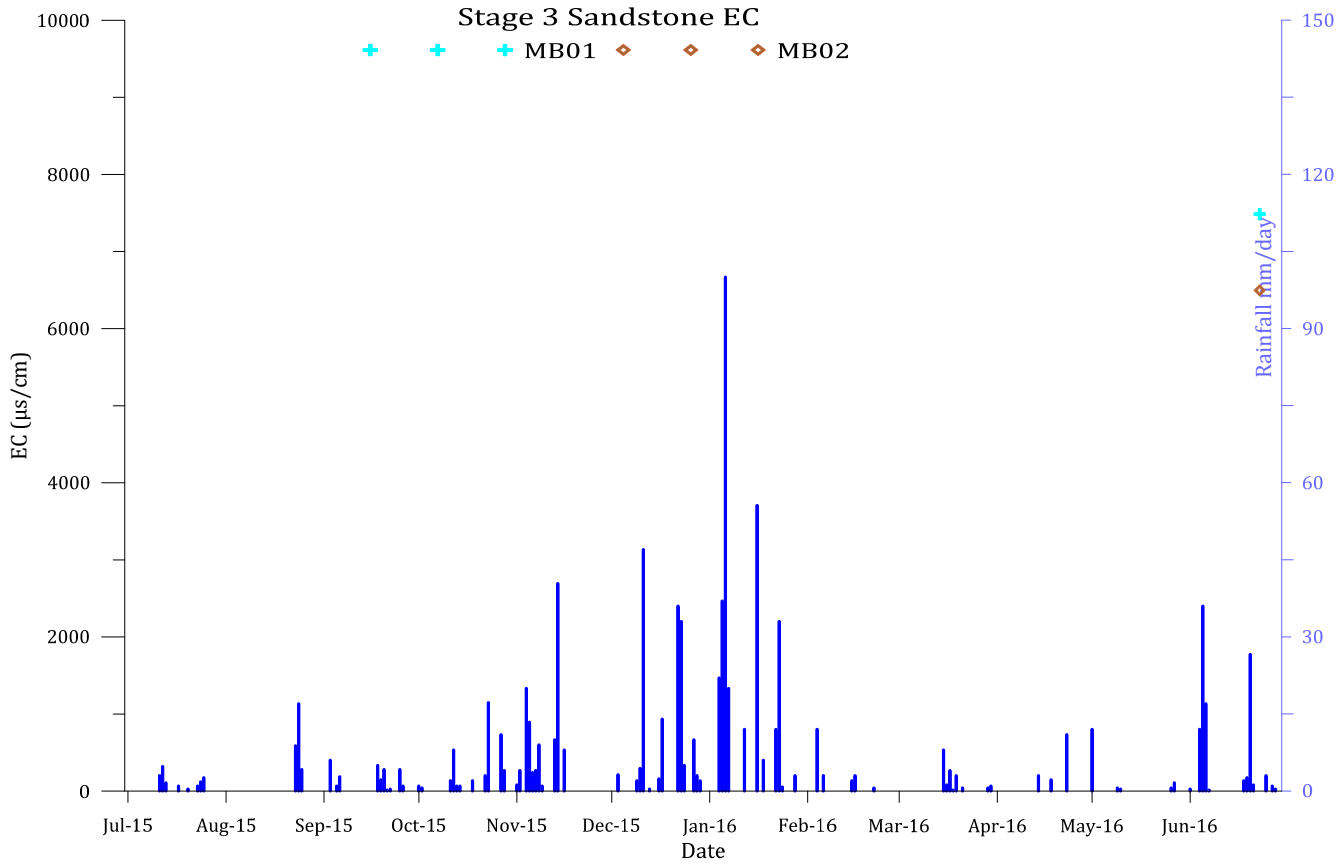
Groundwater Level Monitoring Data – Groundwater Depth and Daily Rainfall



Stage 3 Sandstone Hydrograph

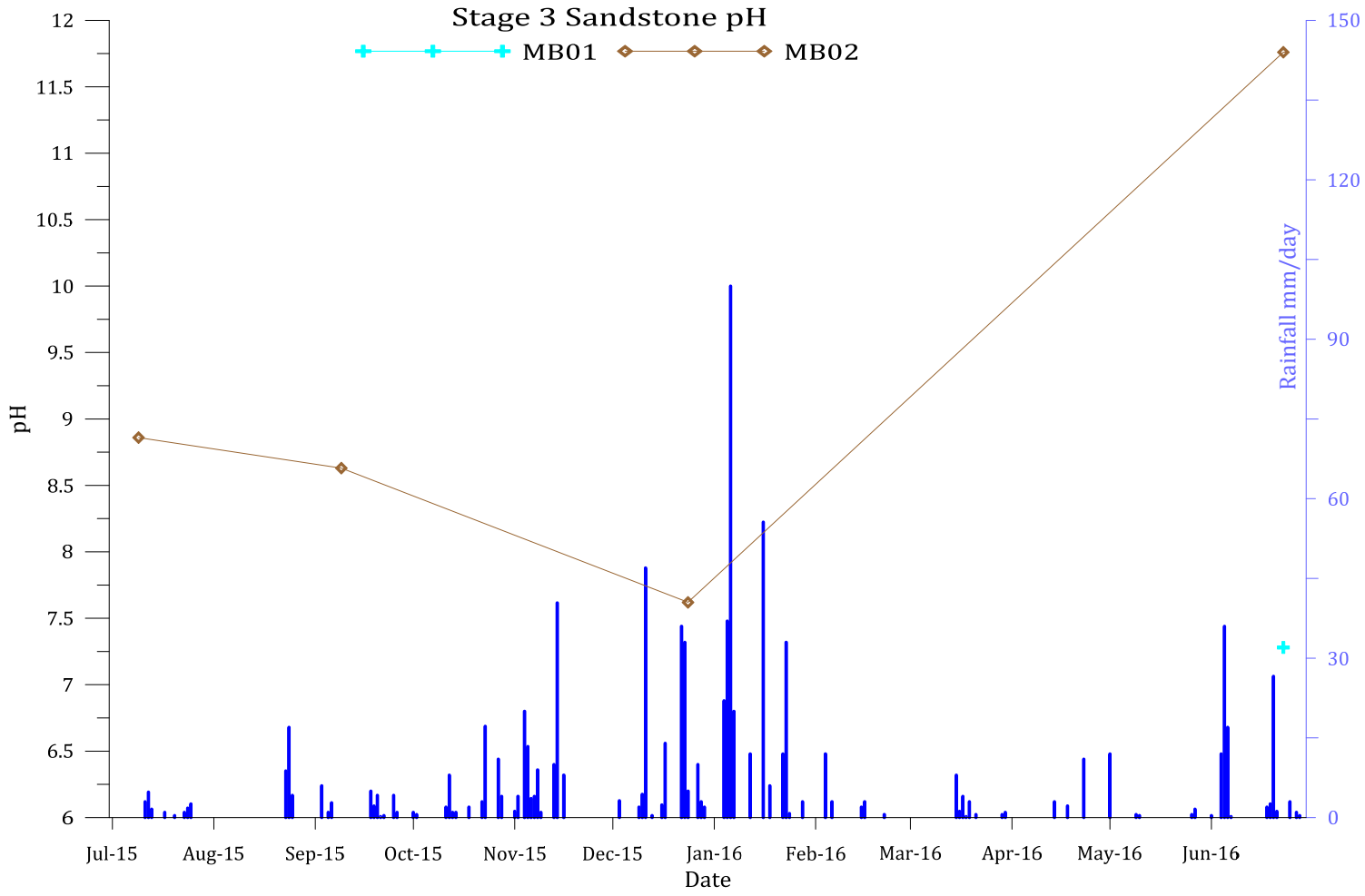


Stage 3 Sandstone EC



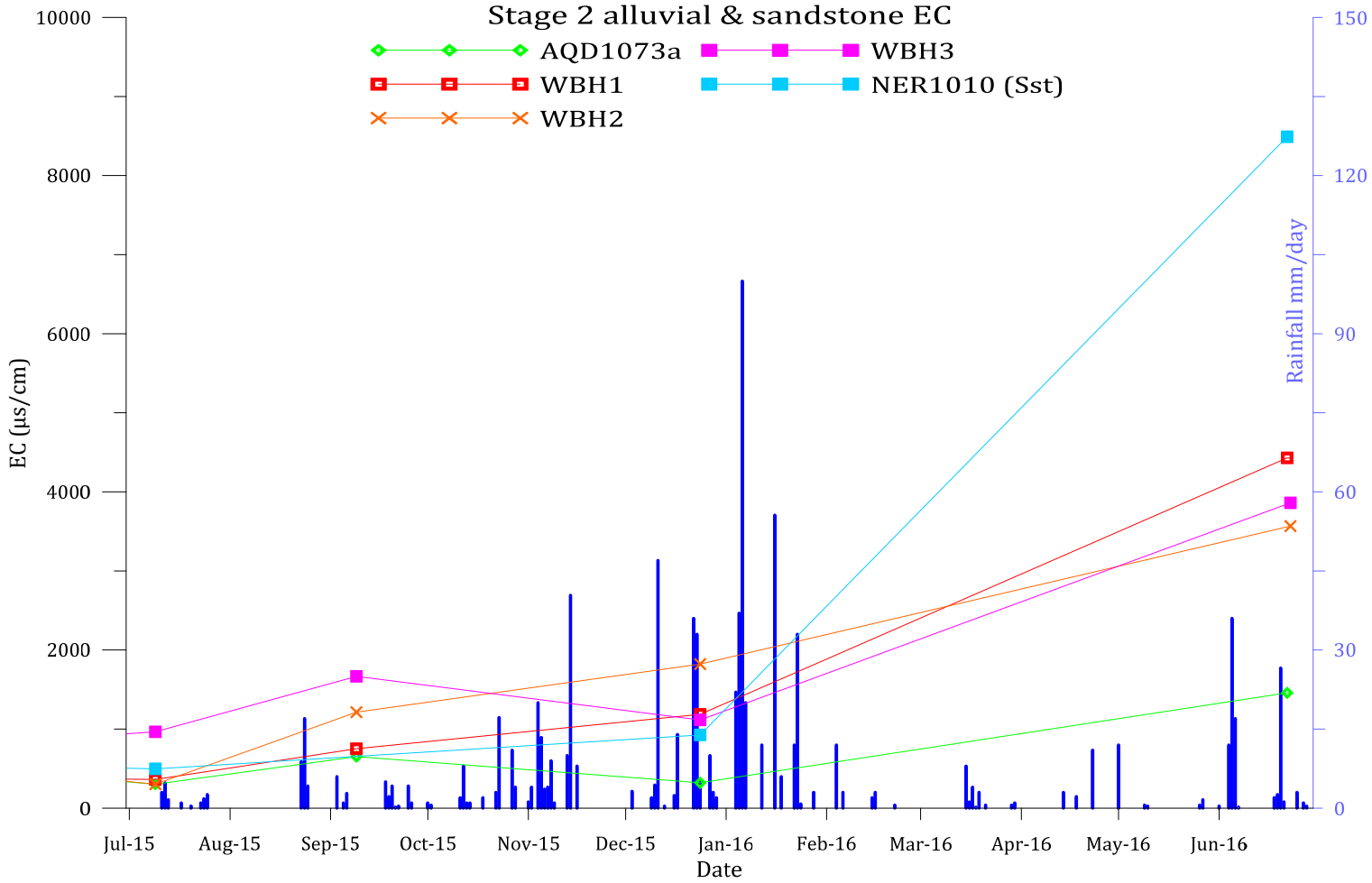
Note: EC was not recorded before the results shown

Stage 3 Sandstone pH

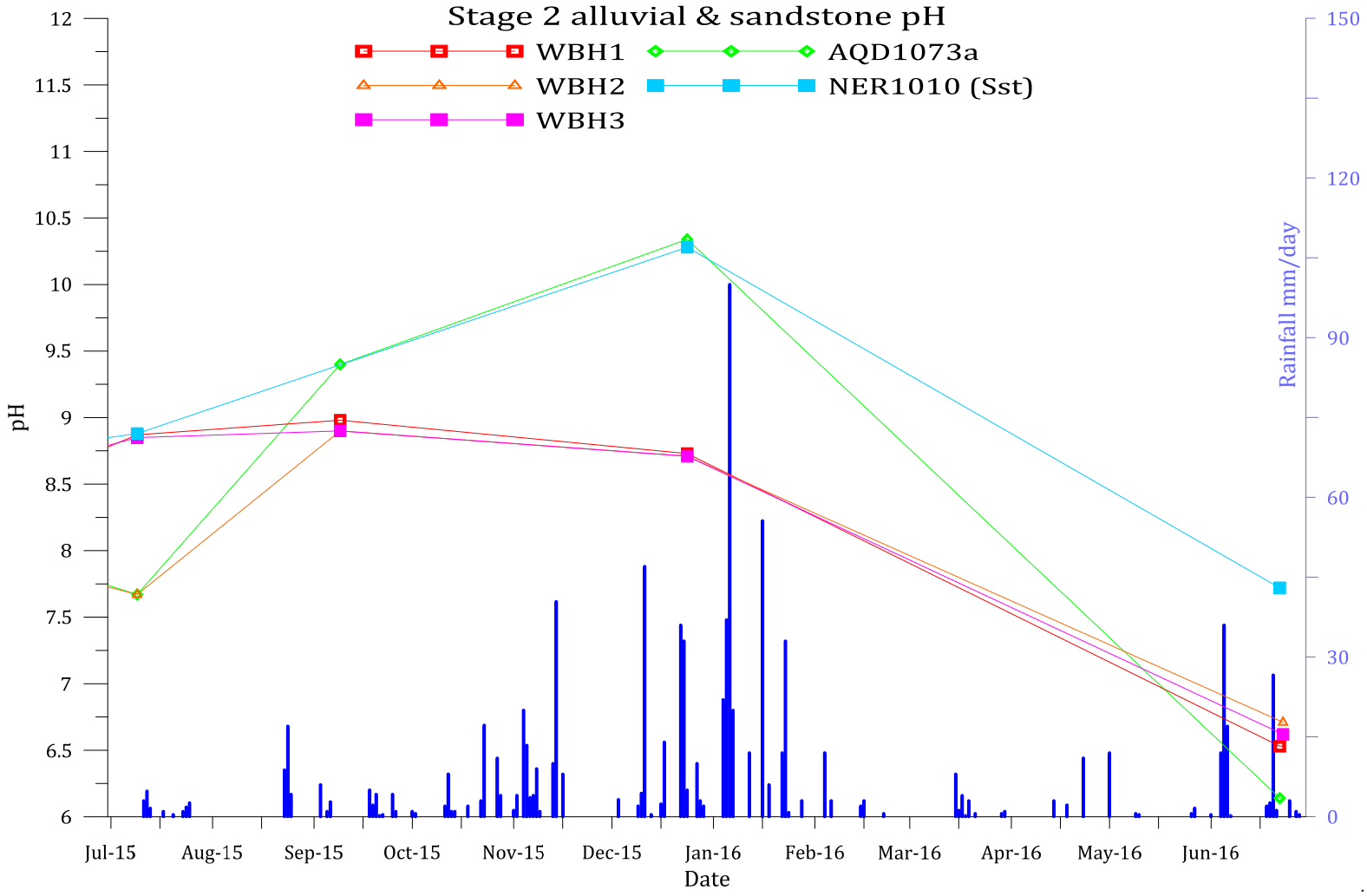


Note: pH was not recorded for MB01 before the results shown

Stage 2 Alluvial and Sandstone EC

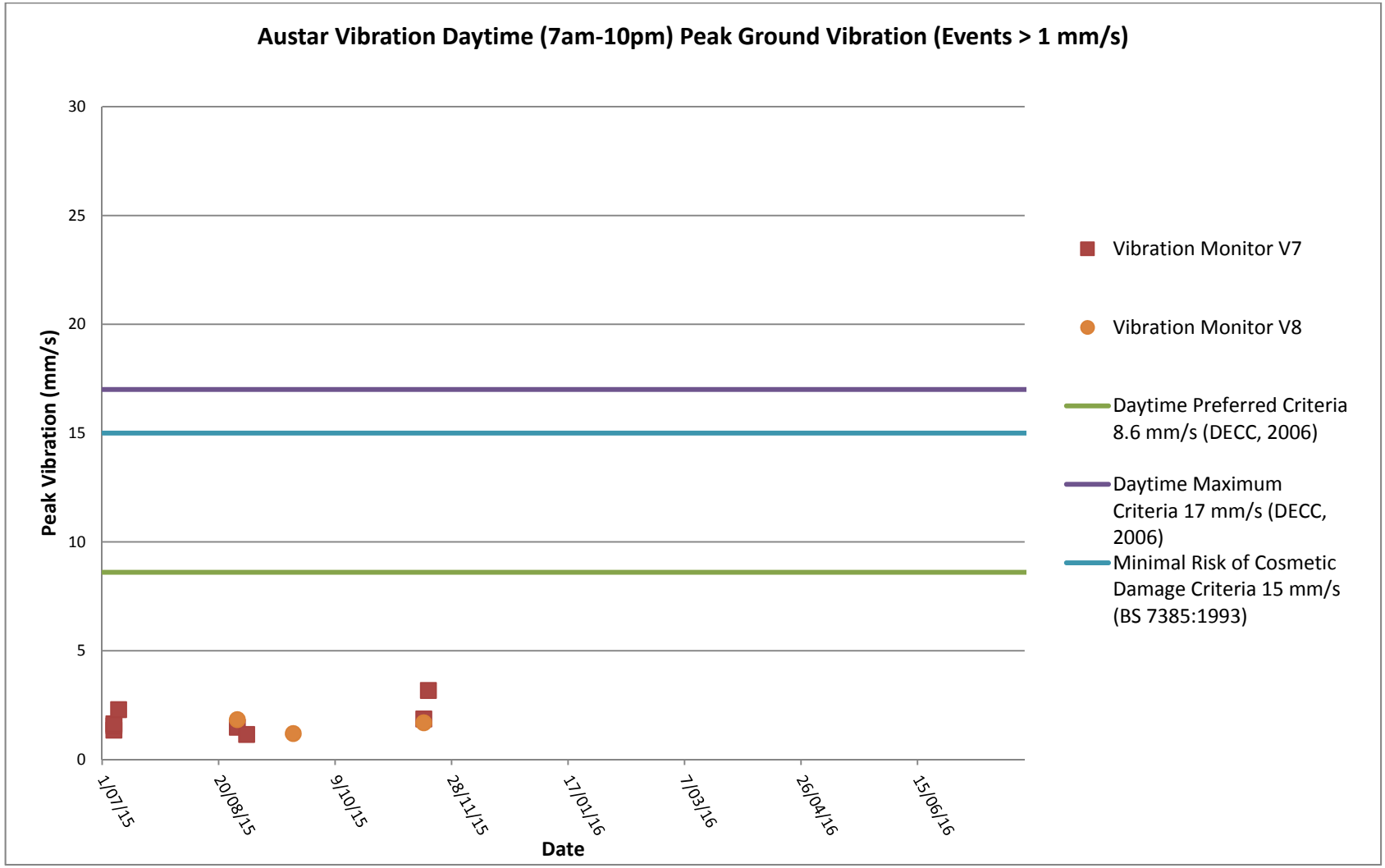


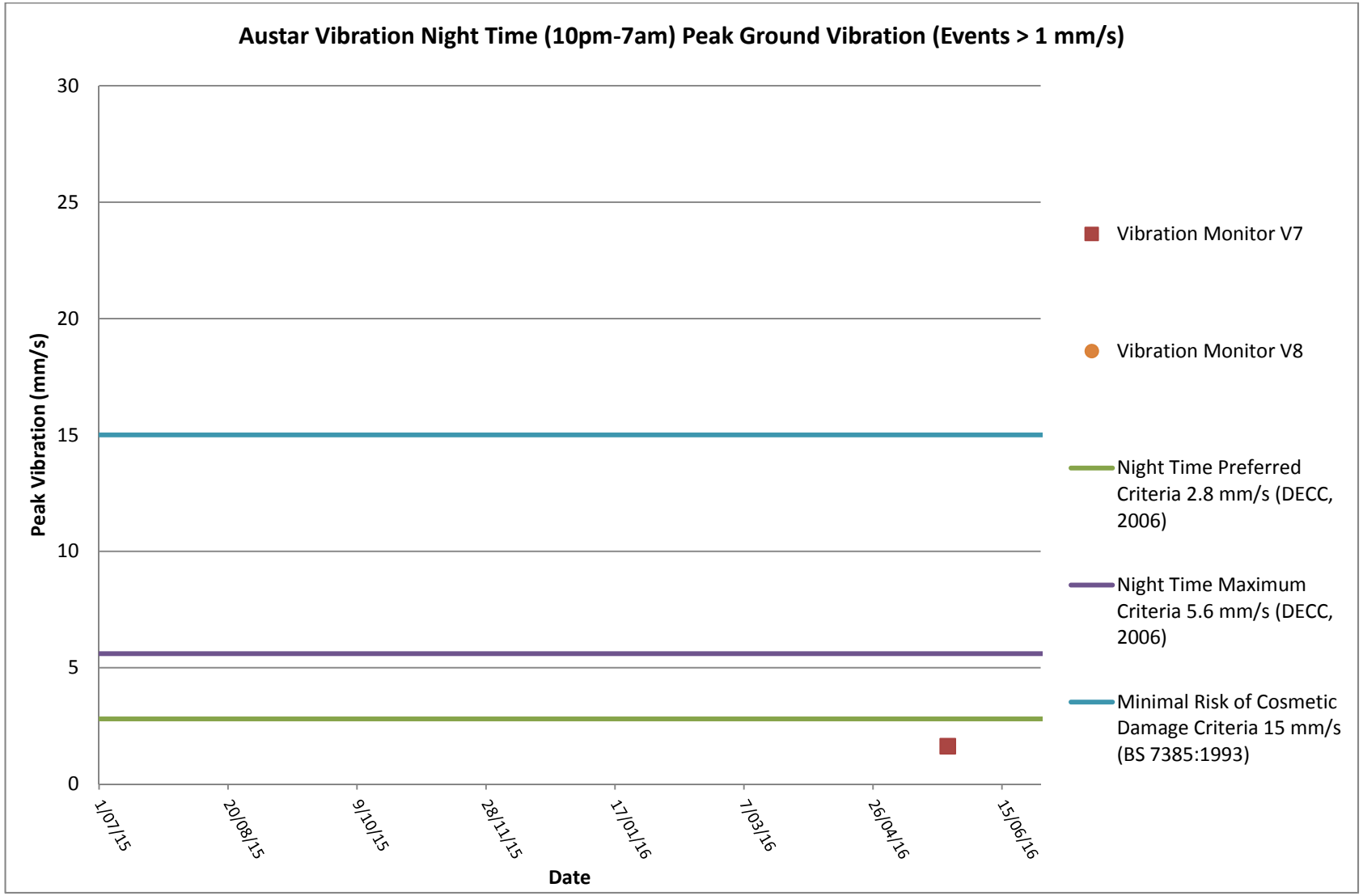
Stage 2 Alluvial and Sandstone pH



Appendix D:

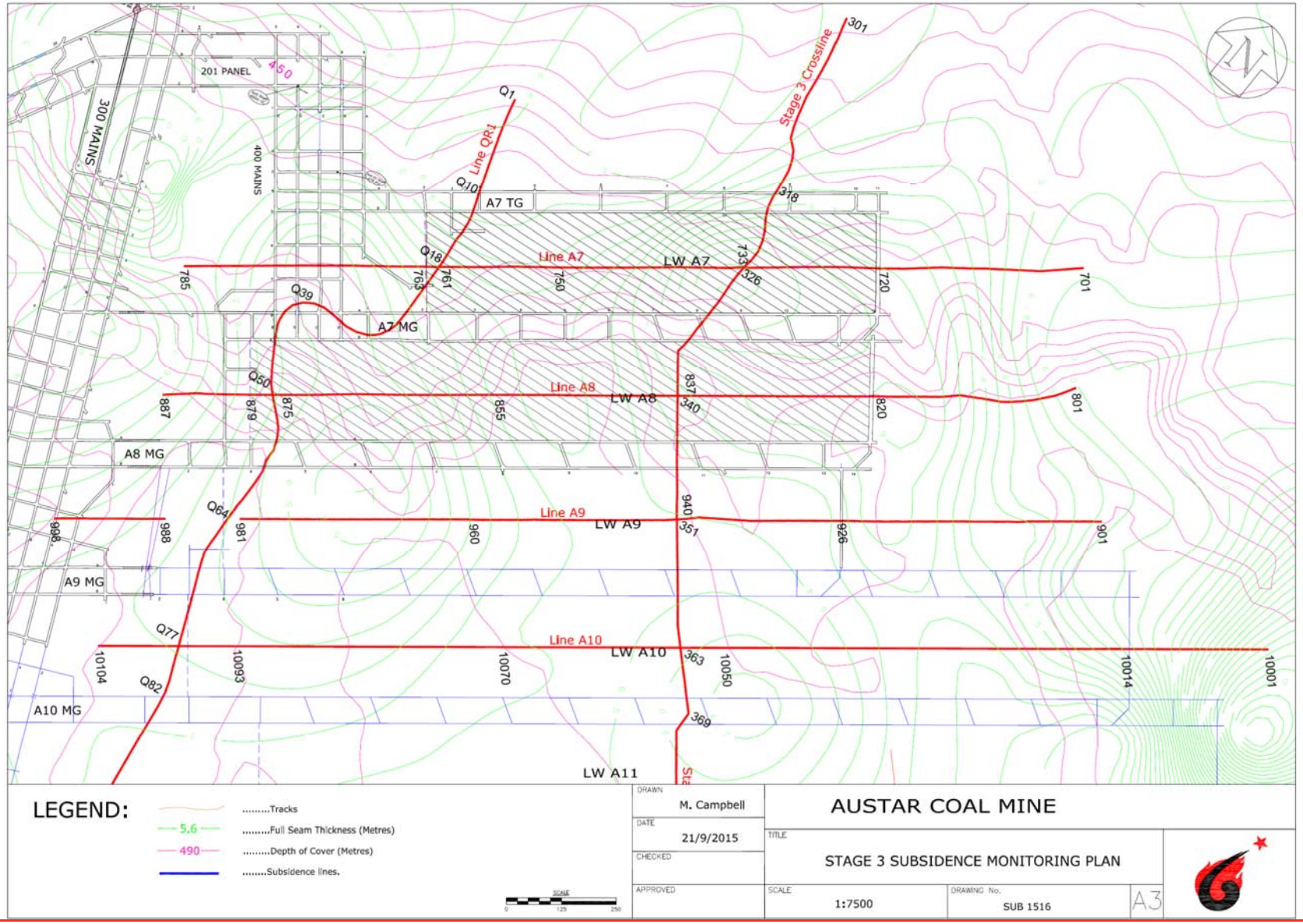
Vibration Monitoring Data

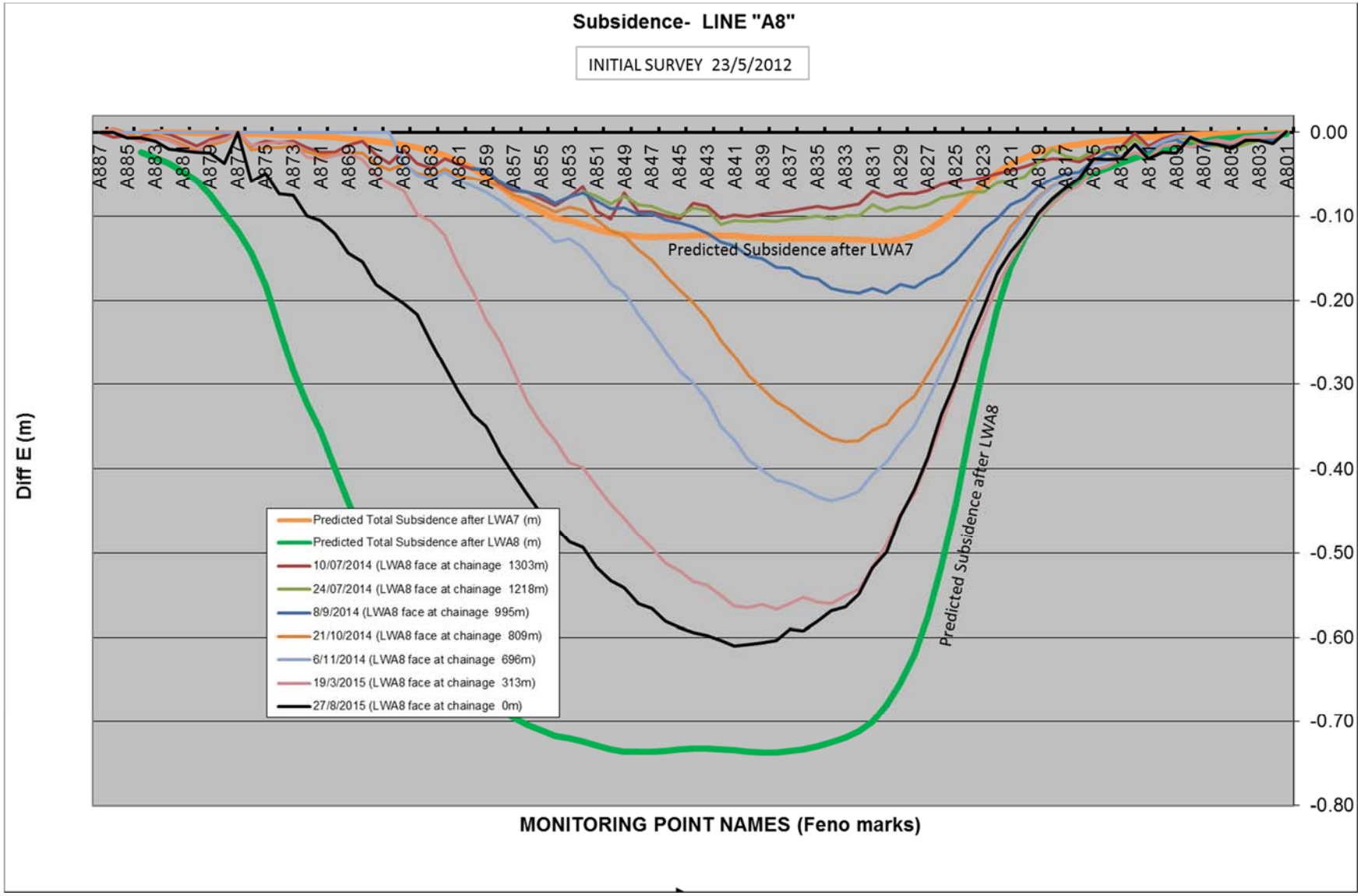

Austar Vibration Daytime (7am-10pm) Peak Ground Vibration (Events > 1 mm/s)
Peak Vibration (mm/s)
30
25
20
15
10
5
0
1/07/15
20/08/15
9/10/15
28/11/15
17/01/16
7/03/16
26/04/16
15/06/16
Date
Vibration Monitor V7
Vibration Monitor V8
Daytime Preferred Criteria 8.6 mm/s (DECC, 2006)
Daytime Maximum Criteria 17 mm/s (DECC, 2006)
Minimal Risk of Cosmetic Damage Criteria 15 mm/s (BS 7385:1993)

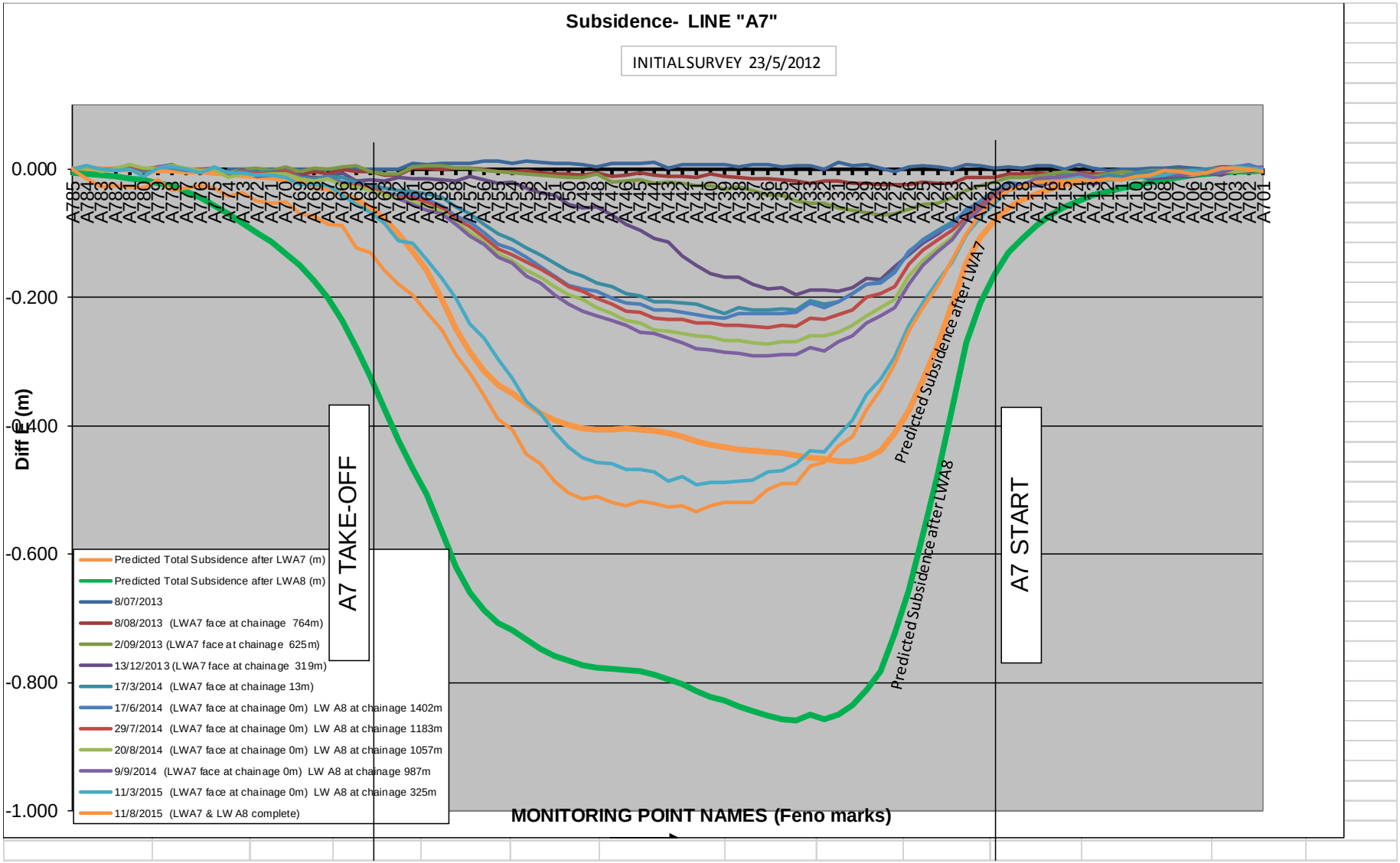

Austar Vibration Night Time (10pm-7am) Peak Ground Vibration (Events > 1 mm/s)
Peak Vibration (mm/s)
30
25
20
15
10
5
0
1/07/15
20/08/15
9/10/15
28/11/15
17/01/16
7/03/16
26/04/16
15/06/16
Date
Vibration Monitor V7
Vibration Monitor V8
Night Time Preferred Criteria 2.8 mm/s (DECC, 2006)
Night Time Maximum Criteria 5.6 mm/s (DECC, 2006)
Minimal Risk of Cosmetic Damage Criteria 15 mm/s (BS 7385:1993)

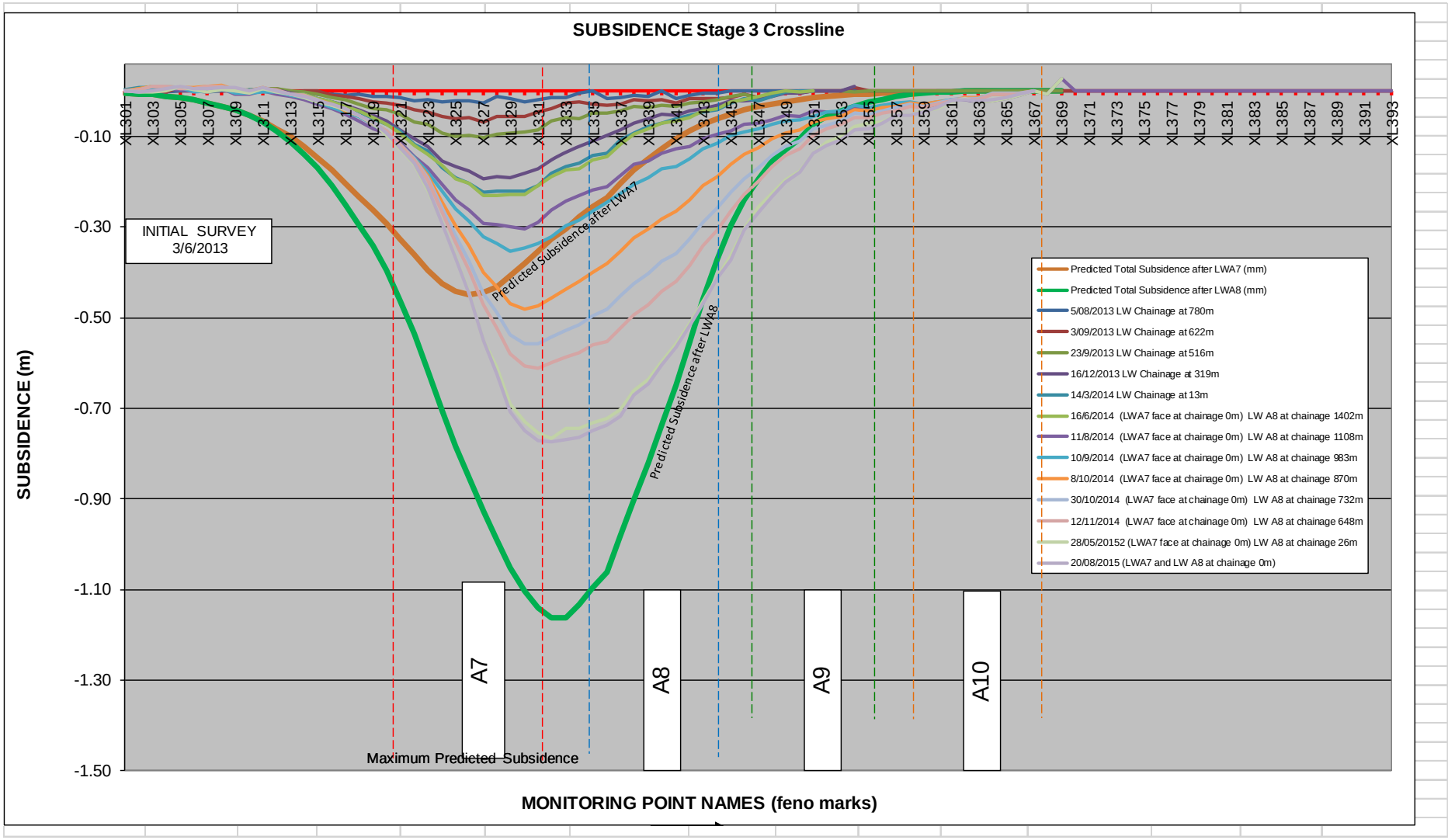
Appendix E:

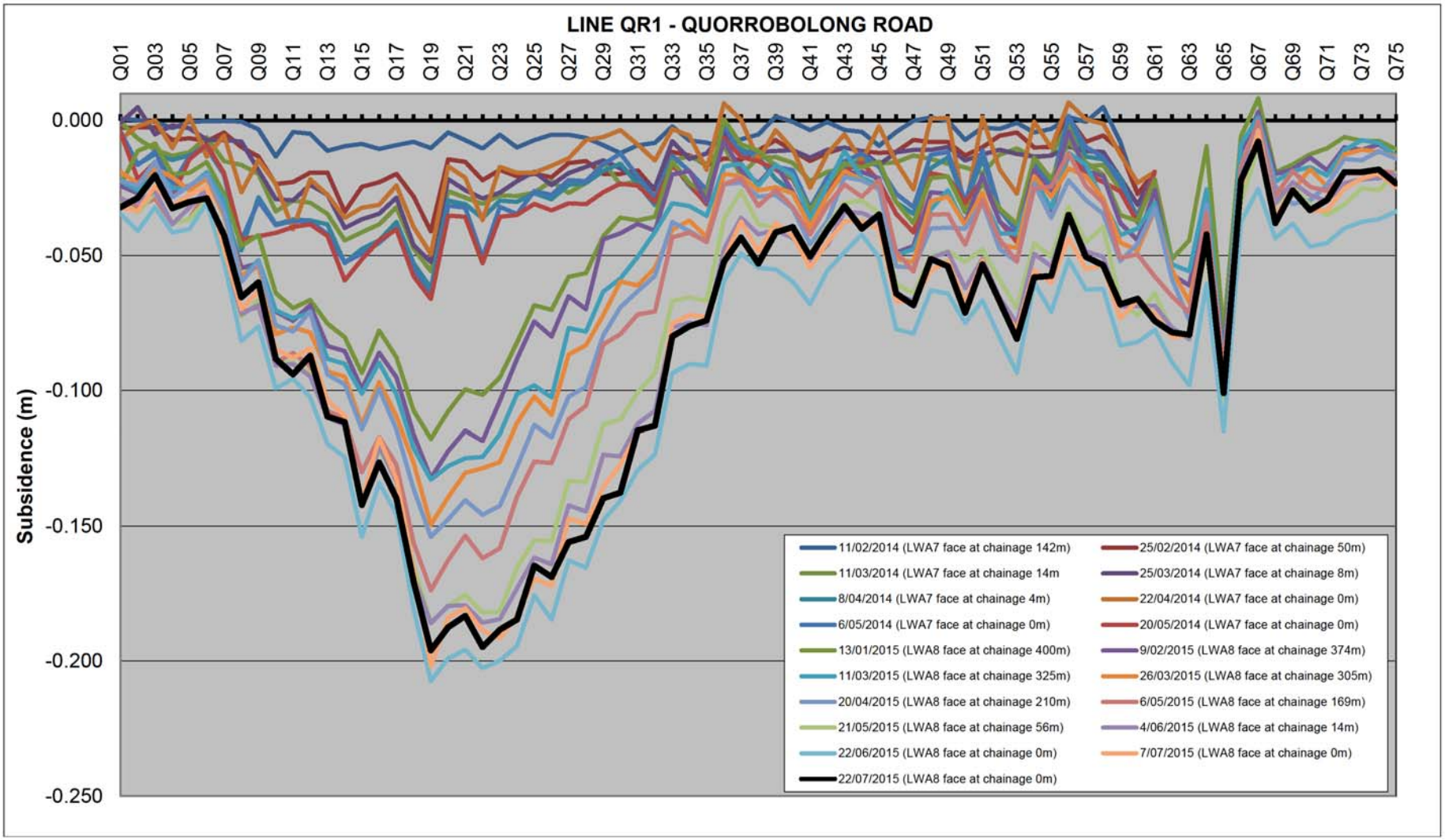
Subsidence Monitoring Data


201 PANEL
450
300 MAINS
400 MAINS
Q1
Line QR1
Q10
Stage 3 Crossline
301
318
A7 TG
Q18
Line A7
LW A7
733
326
785
763
761
750
720
701
Q39
A7 MG
Q50
Line A8
LW A8
837
340
887
879
875
855
820
801
A8 MG
Q64
Line A9
LW A9
940
351
988
981
960
926
901
A9 MG
Q77
Line A10
LW A10
363
10104
Q82
10093
10070
10050
10014
10001
A10 MG
369
LW A11
LEGEND:
.....Tracks
5.6 .....Full Seam Thickness (Metres)
490 .....Depth of Cover (Metres)
.....Subsidence lines.
SCALE
0 125 250
DRAWN
M. Campbell
DATE
21/9/2015
CHECKED
APPROVED
AUSTAR COAL MINE
TITLE
STAGE 3 SUBSIDENCE MONITORING PLAN
SCALE
1:7500
DRAWING No.
SUB 1516
A3


Subsidence- LINE "A8"
INITIAL SURVEY 23/5/2012
Diff E (m)
0.00
-0.10
-0.20
-0.30
-0.40
-0.50
-0.60
-0.70
-0.80
A887 A885 A883 A881 A879 A877 A875 A873 A871 A869 A867 A865 A863 A861 A859 A857 A855 A853 A851 A849 A847 A845 A843 A841 A839 A837 A835 A833 A831 A829 A827 A825 A823 A821 A819 A817 A815 A813 A811 A809 A807 A805 A803 A801
Predicted Subsidence after LWA7
Predicted Subsidence after LWA8
Predicted Total Subsidence after LWA7 (m)
Predicted Total Subsidence after LWA8 (m)
10/07/2014 (LWA8 face at chainage 1303m)
24/07/2014 (LWA8 face at chainage 1218m)
8/9/2014 (LWA8 face at chainage 995m)
21/10/2014 (LWA8 face at chainage 809m)
6/11/2014 (LWA8 face at chainage 696m)
19/3/2015 (LWA8 face at chainage 313m)
27/8/2015 (LWA8 face at chainage 0m)
MONITORING POINT NAMES (Feno marks)


Subsidence- LINE "A7"
INITIAL SURVEY 23/5/2012
0.000
-0.200
-0.400
-0.600
-0.800
-1.000
Diff E (m)
A7 TAKE-OFF
A7 START
Predicted Subsidence after LWA7
Predicted Subsidence after LWA8
Predicted Total Subsidence after LWA7 (m)
Predicted Total Subsidence after LWA8 (m)
8/07/2013
8/08/2013 (LWA7 face at chainage 764m)
2/09/2013 (LWA7 face at chainage 625m)
13/12/2013 (LWA7 face at chainage 319m)
17/3/2014 (LWA7 face at chainage 13m)
17/6/2014 (LWA7 face at chainage 0m) LW A8 at chainage 1402m
29/7/2014 (LWA7 face at chainage 0m) LW A8 at chainage 1183m
20/8/2014 (LWA7 face at chainage 0m) LW A8 at chainage 1057m
9/9/2014 (LWA7 face at chainage 0m) LW A8 at chainage 987m
11/3/2015 (LWA7 face at chainage 0m) LW A8 at chainage 325m
11/8/2015 (LWA7 & LW A8 complete)
MONITORING POINT NAMES (Feno marks)


SUBSIDENCE Stage 3 Crossline
SUBSIDENCE (m)
-0.10
-0.30
-0.50
-0.70
-0.90
-1.10
-1.30
-1.50
XL301 XL303 XL305 XL307 XL309 XL311 XL313 XL315 XL317 XL319 XL321 XL323 XL325 XL327 XL329 XL331 XL333 XL335 XL337 XL339 XL341 XL343 XL345 XL347 XL349 XL351 XL353 XL355 XL357 XL359 XL361 XL363 XL365 XL367 XL369 XL371 XL373 XL375 XL377 XL379 XL381 XL383 XL385 XL387 XL389 XL391 XL393
INITIAL SURVEY
3/6/2013
Predicted Subsidence after LWA7
Predicted Subsidence after LWA8
A7
A8
A9
A10
Maximum Predicted Subsidence
Predicted Total Subsidence after LWA7 (mm)
Predicted Total Subsidence after LWA8 (mm)
5/08/2013 LW Chainage at 780m
3/09/2013 LW Chainage at 622m
23/9/2013 LW Chainage at 516m
16/12/2013 LW Chainage at 319m
14/3/2014 LW Chainage at 13m
16/6/2014 (LWA7 face at chainage 0m) LW A8 at chainage 1402m
11/8/2014 (LWA7 face at chainage 0m) LW A8 at chainage 1108m
10/9/2014 (LWA7 face at chainage 0m) LW A8 at chainage 983m
8/10/2014 (LWA7 face at chainage 0m) LW A8 at chainage 870m
30/10/2014 (LWA7 face at chainage 0m) LW A8 at chainage 732m
12/11/2014 (LWA7 face at chainage 0m) LW A8 at chainage 648m
28/05/20152 (LWA7 face at chainage 0m) LW A8 at chainage 26m
20/08/2015 (LWA7 and LW A8 at chainage 0m)
MONITORING POINT NAMES (feno marks)


LINE QR1 - QUORROBOLONG ROAD
Q01 Q03 Q05 Q07 Q09 Q11 Q13 Q15 Q17 Q19 Q21 Q23 Q25 Q27 Q29 Q31 Q33 Q35 Q37 Q39 Q41 Q43 Q45 Q47 Q49 Q51 Q53 Q55 Q57 Q59 Q61 Q63 Q65 Q67 Q69 Q71 Q73 Q75
0.000
-0.050
-0.100
-0.150
-0.200
-0.250
Subsidence (m)
11/02/2014 (LWA7 face at chainage 142m)
25/02/2014 (LWA7 face at chainage 50m)
11/03/2014 (LWA7 face at chainage 14m
25/03/2014 (LWA7 face at chainage 8m)
8/04/2014 (LWA7 face at chainage 4m)
22/04/2014 (LWA7 face at chainage 0m)
6/05/2014 (LWA7 face at chainage 0m)
20/05/2014 (LWA7 face at chainage 0m)
13/01/2015 (LWA8 face at chainage 400m)
9/02/2015 (LWA8 face at chainage 374m)
11/03/2015 (LWA8 face at chainage 325m)
26/03/2015 (LWA8 face at chainage 305m)
20/04/2015 (LWA8 face at chainage 210m)
6/05/2015 (LWA8 face at chainage 169m)
21/05/2015 (LWA8 face at chainage 56m)
4/06/2015 (LWA8 face at chainage 14m)
22/06/2015 (LWA8 face at chainage 0m)
7/07/2015 (LWA8 face at chainage 0m)
22/07/2015 (LWA8 face at chainage 0m)

Appendix F:

Community Complaints

Austar Coal Mine Community Complaints Register
July 2015 to June 2016

Complaint No	Category	Date	Property	Detail	Follow Up Actions
1	Odour	15/02/2016	Keelendi Rd, Bellbird Heights	The EPA received a complaint with the following details "Extreme odour of sulphur-rotten egg smell, possibly coming from an old mine site at back of Keelendi Rd, Bellbird Heights. Odour started at 23:00 on 13/2/16 and was still present at 08:00 on 14/2/16". EPA requested advice on the complaint by return email.	Environment & Community Manager (ECM) responded to EPA email on 15/2/16. Advised that the issue may relate to our Aberdare Reject Emplacement Area, which is a former open cut pit just south of Keelendi Rd in which we dispose of coarse reject. Austar has identified smouldering of a couple of coarse reject piles which may be responsible for the odour. This is not a normal occurrence in this area. A works team was mobilised to the site to rectify the issue. This involved pushing out the pile and soaking with water to stop the smouldering. ECM offered to discuss directly with the community member. EPA passed on the complainant's details and the ECM called to provide an update on the likely source of odour and the actions taken. The resident appreciated the call.
2	Odour	15/02/2016	Clare St and Margaret St Bellbird Heights	Cessnock City Council Environmental Health officers received complaints from residents regarding an odour possibly from the Austar Coal Mine.	ECM advised the Environmental Health Officer that the issue may relate to our Aberdare Reject Emplacement Area, which is a former open cut pit just south of Bellbird Heights in which we dispose of coarse reject. Austar identified smouldering of a couple of coarse reject piles which may be responsible for the odour. A works team was mobilised to the site to rectify the issue. This involved pushing out the pile and soaking with water to stop the smouldering. ECM offered to discuss directly with the community member. The Council EHO will pass on the ECM contact details.
3	Odour	26/02/2016	Clare St, Cessnock	Call received at 8:40am. Odour from the Aberdare former open cut pit can be smelt again. Complainant has lived in the area for 50 years. Can recalls fly rock striking the neighbours house during the open cut operation. Noted it is not normal to smell the odour.	ECM advised CHPP personnel that inspected the area. Austar identified smouldering of a couple of coarse reject piles which may be responsible for the odour. This is not a normal occurrence in this area. A works team was immediately mobilised to the site to rectify the issue. This involved pushing out the pile and soaking with water to stop the smouldering. ECM contacted the caller at 12:28pm to provide feedback on investigation and actions. The resident appreciated the call and actions undertaken.

Austar Coal Mine Community Complaints Register
July 2015 to June 2016

Complaint No	Category	Date	Property	Detail	Follow Up Actions
4	Odour	26/02/2016	O'Brien St, Cessnock	Call received at 9:50am. Resident indicated there is a strong smell from the Aberdare pit area. Considers that the smell has been occurring for 2 weeks and nothing has been done. Could not open the windows last night because of the odour.	ECM advised the caller that there was a previous odour event identified on the weekend around the 15/2/16. Austar had previously attended to that by spreading the coarse reject piles and wetting with a water cart. ECM advised that a works team was being mobilised to address the odour in the same manner. 12:20pm ECM phoned back with an update noting that a watercart and backhoe were in the area to push out and soak the area to stop the smouldering and it should be fixed by the afternoon. ECM offered that the resident should call as soon as they are aware of any issues so that Austar can quickly address them. The resident appreciated the feedback.
5	Odour	26/02/2016	Margaret St, Cessnock	The complainant contacted Austar Control Room. Control Room Operator passed the details to ECM to call back. ECM called resident back at 11:00am. Resident advised of a strong smell which started at night time. Noted that she believed that the odour had been occurring on and off for last 3 weeks. Has lived in the area for 6 years and has not previously smelt the odour.	ECM advised of the current operations that occur in the coarse reject emplacement area. Advised of the previous smouldering event which Austar became aware of on 15/2/16 and addressed by spreading and wetting. ECM advised that a works crew were being mobilised to address the issue today. 12:30pm ECM left a voice message on the mobile indicating that the works team were on site and undertaking works. Offered that the resident should call if any further issues are identified.
6	Odour	28/02/2016	Margaret St, Cessnock	The complainant contacted Austar Control Room. Control Room Operator passed the details to ECM to call back. ECM called resident back at 9:50pm. Resident advised that the strong smell has returned. ECM advised that we will investigate further in the morning and will contact her tomorrow to advise of investigation outcomes.	ECM sent details of complaint to CHPP personnel. CHPP personnel investigated early the following morning. Found piles near the previous area were smouldering. Arranged for larger earthmoving equipment to spread all piles of coarse reject material, wet down and compact with dozer. This was completed by lunchtime on 29/2/16, leaving no remnant heat in the spread material, confirmed by walkover of the area. ECM called resident at 4:25pm and left voicemail message regarding actions.

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Complaint No	Category	Date	Property	Detail	Follow Up Actions
7	Odour	29/02/2016	Clare St, Cessnock	The complainant contacted ECM directly and left voicemail message at 7:37am. The terrible smell from the Aberdare former open cut pit is back. Please do something about it.	CHPP personnel investigated early in the morning. Found piles near the previous area were smouldering. Arranged for larger earthmoving equipment to spread all piles of coarse reject material, wet down and compact with dozer. This was completed by lunchtime on 29/2/16, leaving no remnant heat in the spread material, confirmed by walkover of the area. ECM called resident at 4:27pm. Resident appreciated the call back and actions.
8	Odour	1/03/2016	Unknown	EPA received a complaint regarding odours/fumes from the Austar premises alleged to be being generated from waste materials being imported onto the site. The caller has stated that he has previously discussed the matter with the site and that there was an indication that the material may be spontaneously combusting. The EPA requires the submission of a brief written report outlining the nature of the issue, detailing the material involved and outlining actions being taken to manage the situation to address these impacts by 2 March 2016.	ECM called the EPA officer on 1/3/16 to relay actions that have already been completed in response to odour from which have ceased odour in the area on 29/2/16. A written report was provided to the EPA on 2/3/16 detailing complaints received and actions taken

Austar Coal Mine Community Complaints Register
July 2015 to June 2016

Complaint No	Category	Date	Property	Detail	Follow Up Actions
9	Noise	6/03/2016	Glennie St, Ellalong	Austar Control Room received a call at 10:35pm. The resident indicated that compressor noise was really loud at his house and wouldn't be able to sleep and never heard it that loud before.	Control Room Operator contacted the shift Undermanager and sent security over to investigate. The Security noted that the compressor noise was louder than when he was there earlier. A mine electrician was called out from underground to investigate and found a fault with a fitting on the nitrogen plant dryer. The faulty fitting was isolated which fixed the noise issue. ECM called resident back 8/3/16 to provide feedback on the actions in relation to the complaint. Resident appreciated the feedback.

Appendix G:

Environmental Incidents

Austar Coal Mine 2015-2016 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
1	11/8/2015	During a routine pipeline inspection a wet area of ground was observed in a Crown Land section of the pipeline. Environmental & Community Coordinator attended and confirmed the potential for the wet area to be mine water.	**Immediate Actions:** Pumps were turned off. Isolation valves were closed. DPI - Crown Land were notified of maintenance activities occurring on the section of Crown Land. Investigation by engineering department to identify potential leak commenced the following day and could not identify any leaks. There is a possibility the wet area was attributable to a previous pipeline incident in March 2015. **Follow up Actions:** Monitoring observation points installed near pipeline. Sampling of observation points did not show evidence of mine water leak from the pipeline. Monitoring ceased after a period and routine pipeline inspections continued.
2	20/8/2015	During routine inspection by CHPP personnel, a small wet area of ground was observed near a Sodium Hydroxide tank bunded area. Environmental & Community Manager attended to inspect. The wet ground appeared to originate from a membrane lined bund wall and also around a bund drain valve, no further leak was occurring at time of inspection.	**Immediate Actions:** CHPP personnel reviewed the integrity of the bund wall and valve for the Sodium Hydroxide tank, and arrange repairs. Sodium Hydroxide tank pumped empty to remove potential source during investigation and remediation. Wet ground area remediated. **Follow up actions:** - Alternative stainless steel liner for bund was installed prior to recommissioning of sodium hydroxide dosing.
3	6/1/2016	A discharge from Kitchener SIS sediment basins occurred during greater than design rainfall. The sediment basins are approved in the Shaft Construction Environmental Management Plan by DPE, but are not licenced discharge points. The incident was reported to the EPA.	**Immediate Actions:** The Pollution Incident Response Management Plan was triggered. **Follow up Actions:** A report was submitted to EPA on 13 January 2016, Dams were pumped down in readiness for future rainfall events.
4	15/2/2016	A leak for the No 2 shaft pipeline was identified as small wet area of ground in Dry Creek Road reserve.	**Immediate Actions:** Pipeline was immediately isolated and Cessnock City Council was notified of maintenance works on the pipeline. **Follow up Actions:** The section of pipeline was repaired.

Austar Coal Mine 2015-2016 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
5	5/3/2016	A water sump at the No. 3 shaft fan sump overflowed spilling to land due to pump failure at the sump. Spilled water was limited to area of ground adjacent to the fan compound.	**Immediate Actions:** Temporary pumping arrangements installed to prevent further spill. **Follow up Actions:** Pump replacement was undertaken.
6	24/6/2016	Hunter Water from a 0.5ML tank spilled to land due to failure of an inlet valve to fully close when the tank reached high level. Water in the 0.5ML tank was supplied by Hunter Water therefore no environmental impact. The tank overflow pipe discharges to ground adjacent to the tank.	**Immediate Actions:** Turn off pumps to prevent further spill. **Follow up Actions:** Add more detailed inspection of this type of valve on surface tanks. The overflow pipe was directed to Kalingo Dam rather than to ground.