




# Annual Environmental Management Report

July 2016 – June 2017



<b>Name of operation</b>	Austar Coal Mine
<b>Name of operator</b>	Yancoal Mining Services Pty Ltd
<b>Development consent / project approval #</b>	Refer Table 1.2
<b>Name of holder of development consent / project approval</b>	Austar Coal Mine Pty Ltd
<b>Mining lease #</b>	Refer to Table 1.4
<b>Name of holder of mining lease</b>	Austar Coal Mine Pty Ltd
<b>Water licence #</b>	Refer Table 1.5
<b>Name of holder of water licence</b>	Austar Coal Mine Pty Ltd
<b>MOP start date</b>	<b>MOP 1:</b> 27 Nov 2015, <b>MOP 2:</b> 9 Sep 2016
<b>MOP end date</b>	<b>MOP 1:</b> 26 Nov 2022, <b>MOP 2:</b> 1 Jun 2023
<b>AEMR / Annual Review start date</b>	1 July 2016
<b>AEMR / Annual Review end date</b>	30 June 2017
<p><b>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 2016 to 30 June 2017 and that I am authorised to make this statement on behalf of Austar Coal Mine Pty Ltd.</b></p> <p><i>Note.</i></p> <p>a) <i>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.</i></p> <p>b) <i>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).</i></p>	
<b>Name of authorised reporting officer</b>	Gary Mulhearn
<b>Title of authorised reporting officer</b>	Environment and Community Manager
<b>Signature of authorised reporting officer</b>	
<b>Date</b>	29 September 2017

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## 1 INTRODUCTION

### 1.1 Scope

This Annual Environmental Management Report (AEMR) covers the twelve month reporting period from 1 July 2016 to 30 June 2017. 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.



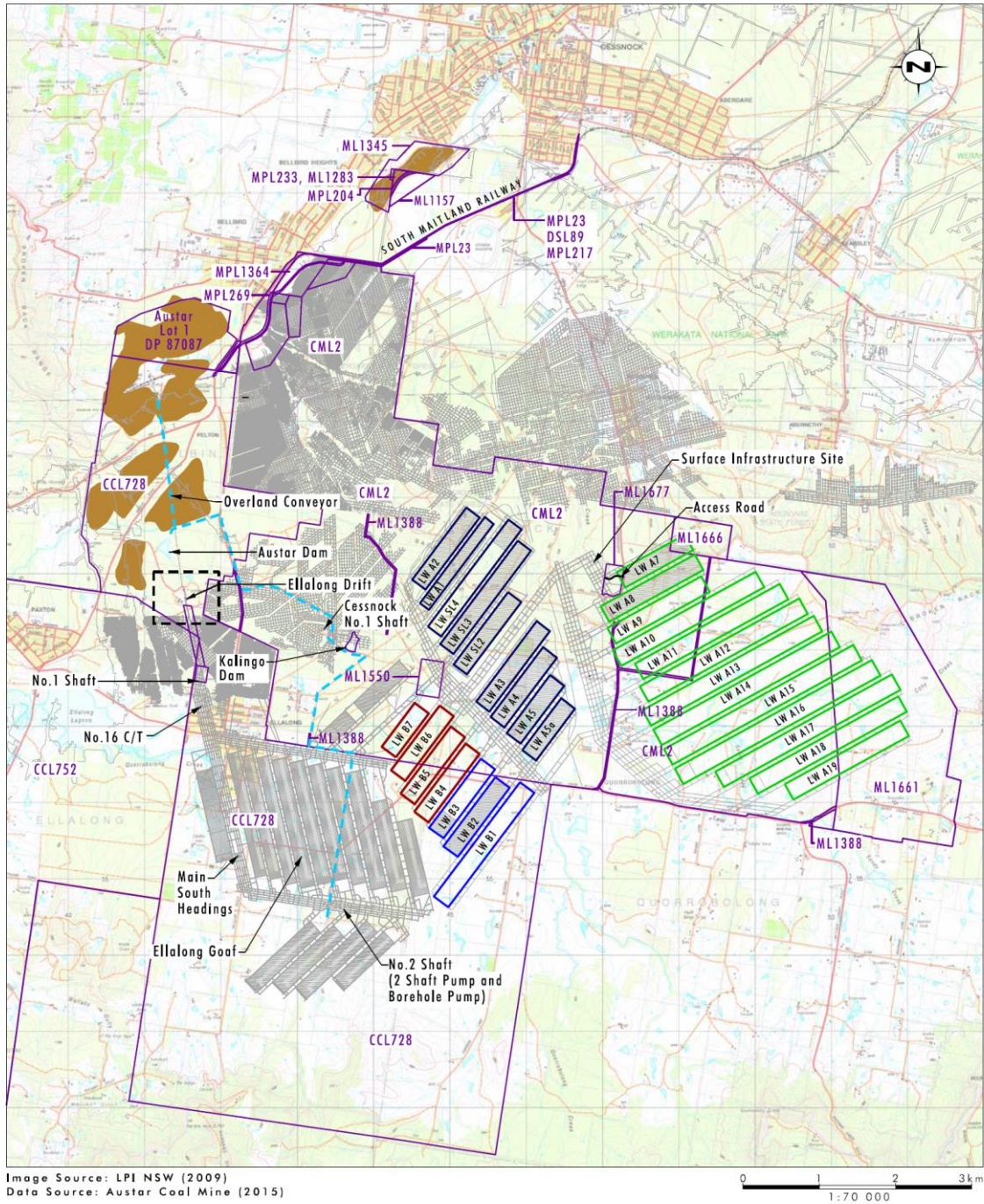
Mining in the second Stage 3 panel (Longwall A8) commenced on 16 June 2014 and was completed on 24 June 2015. Austar made a business decision to relocate development operations to the Bellbird South and Ellalong Colliery areas in 2015. However, the Stage 3 Project remains central to the long term future 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. Longwall extraction of LWB2 commenced 7 July 2016.

The approved Mining Operations Plan (MOP) in place at the start of this AEMR period, covered the period November 2015 to November 2022, which was endorsed by DRE on 27 November 2015. A new MOP was submitted in August 2016, in response to the modification approval to DA29/95, which covers the period 9 September 2016 to 1 June 2023, and was approved by DRE on 9 September 2016. 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 for longwall panels LWB1 to LWB3 was approved by DPE on 4 July 2017; and
- A modification application to DA29/95 was prepared and submitted to DPE on 22 May 2017, this was undertaken to extend the extraction plan requirements to proposed longwall panels LWB4-LWB7.

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



- Legend**
- ▭ B1-B3 Extraction Plan Longwall Panels (DA29/95 MOD 6)
  - ▭ Proposed B4-B7 Longwall Panels (DA25/95 MOD 7)
  - ▭ Completed Bellbird South Stage 1, Stage 2 and Southland Longwall Panels (DA29/95)
  - ▭ Layout for Stage 3 Longwall Panels (PA08\_0111 MOD3)
  - ▭ Approved Reject Emplacement Areas
  - ▭ Completed Underground Workings
  - ▭ Mining Lease Boundary
  - Water Pipeline

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FIGURE 1.1  
Austar Coal Mine Complex

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	
<p><b>Annual Review</b></p> <p>5. By the end of September each year, unless the Secretary agrees otherwise, the Applicant must submit a review to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must:</p> <p>(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;</p> <p>(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:</p> <ul style="list-style-type: none"> <li>• relevant statutory requirements, limits or performance measures/criteria;</li> <li>• requirements of any plan or program required under this consent;</li> <li>• monitoring results of previous years; and</li> <li>• relevant predictions in the documents listed in condition 2 of Schedule 2;</li> </ul> <p>(c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the development;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measures will be implemented over the next year to improve the environmental performance of the development.</p>	<p>This AEMR</p> <p>Section 2 &amp; 5</p> <p>Sections 3 &amp; 4</p> <p>Section 3</p> <p>Section 3</p> <p>Section 3</p> <p>Section 6</p>
PA 08_0111	Section of the AEMR
Schedule 7	
<p><b>Annual Review</b></p> <p>3. Each year, the Proponent shall review the environmental performance of the mine complex to the satisfaction of the Director-General. This review must:</p> <p>(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;</p> <p>(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:</p> <ul style="list-style-type: none"> <li>• the relevant statutory requirements, limits or performance measures/criteria;</li> <li>• the monitoring results of previous years; and</li> <li>• the relevant predictions in the EA and Extraction Plan;</li> </ul> <p>(c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the mine complex;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the mine complex, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measure will be implemented over the next year to improve the environmental performance of the mine complex.</p>	<p>This AEMR</p> <p>Sections 2, 5 &amp; 6</p> <p>Sections 3 &amp; 4</p> <p>Section 3</p> <p>Section 3</p> <p>Section 3</p> <p>Section 6</p>

### 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. <ul style="list-style-type: none"> <li>Approval for underground coal mining.</li> <li>Construction of a new access drift, upcast shaft and ventilation shaft.</li> <li>Expansion of the Pelton CHPP.</li> <li>Conveyance of coal from the Ellalong pit top to the Pelton CHPP Operation of the Pelton CHPP for the washing and handling of coal.</li> <li>Water management systems.</li> <li>Upgrade of the Pelton rail loading facility and railway spur.</li> <li>Reject emplacement underground, company owned land, open cut areas adjoining Pelton and other abandoned mine sites.</li> </ul>
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. <ul style="list-style-type: none"> <li>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.</li> </ul>
DA 118/691/181 (modification)	11 January 1993	CCC	Pelton Open Cut Coal Mine – Modification. <ul style="list-style-type: none"> <li>Extension of open cut mining area.</li> <li>Infrastructure and water management modifications.</li> </ul>
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. <ul style="list-style-type: none"> <li>Upgrade and replacement of coal handling infrastructure such as surge bin, automatic stacking system, reclaim facilities and skyline conveyor.</li> <li>Increase in stockpile capacity.</li> <li>Upgrade to water management system.</li> <li>Extension of the reclaim tunnel.</li> <li>Construction of a mine water transfer pipeline from Ellalong Colliery to Pelton.</li> </ul>

Consent Description	Date	Approval Authority	Approved Development
			<ul style="list-style-type: none"> <li>Provision of underground workings for emergency mine water disposal.</li> <li>Upgrade of lime treatment plant.</li> </ul>
DA 118/693/42	26 Nov 1993	CCC	<p>Extension of Pelton Open Cut Mine.</p> <ul style="list-style-type: none"> <li>Extension of open cut mining area including emplacement of overburden in previously mined blocks and extension of the mine's water management system.</li> </ul>
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	<p>Establishment of Overburden Stockpile at Pelton Colliery.</p> <ul style="list-style-type: none"> <li>Establishment of an overburden stockpile for the Pelton Open Cut Operations.</li> </ul>
DA 118/695/81	12 July 1995	CCC	<p>Additions for Bathhouse, Office and Car park at Ellalong Colliery.</p> <ul style="list-style-type: none"> <li>Extension to the bathhouse at the Ellalong drift site.</li> <li>Extension of existing offices or construction of portable offices.</li> <li>Construction of a 4000 square metre car park.</li> </ul>
DA 8/1999/1658	18 Feb 2000	CCC	<p>Relocation of Ventilation Facilities at Bellbird South Underground Mine.</p> <ul style="list-style-type: none"> <li>Installation of a ventilation shaft and fan house.</li> <li>Upgrading of the existing access track to the site from the Pelton-Ellalong Road.</li> </ul>
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.
DA 29/95	14 Feb 1996	Minister for Urban Affairs and Planning	<p>Ellalong Colliery Extension into Bellbird South.</p> <ul style="list-style-type: none"> <li>Extension of underground mining activities into Bellbird South area (CML 2).</li> <li>Mine life of 21 years with a production of 3 Mtpa.</li> <li>Reject emplacement.</li> <li>Construction and operation of a new infrastructure site including new ventilation shaft and fan(s) (No. 2 Shaft) adjacent to Sandy Creek Road.</li> <li>Use of Pelton CHPP for washing and handling of coal.</li> </ul>

Consent Description	Date	Approval Authority	Approved Development
			<ul style="list-style-type: none"> <li>• Provision of a maximum raw coal stockpile of 100,000 t.</li> <li>• Reopening of disused Cessnock No. 1 Colliery shafts for ventilation and access, or the sinking of new shafts, as required.</li> <li>• Construction of various water management devices including sedimentation and clean water dams and drainage systems.</li> </ul>
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. <ul style="list-style-type: none"> <li>• Use of longwall top coal caving (LTCC) mining methods in longwall panels (A1 to A5).</li> <li>• Installation of a larger capacity fan at the site approved for DA 8/1999/1658.</li> <li>• Installation of a new downcast ventilation shaft.</li> <li>• Installation of a new 10 MVA substation.</li> <li>• Installation of a nitrogen inertisation plant with a 2,000 m<sup>3</sup> capacity.</li> <li>• Provision of a diesel and emulsion fluid storage area and dispatch system.</li> <li>• Installation of a tube bundle shed to house electronic monitoring equipment.</li> <li>• Upgrade of the existing water treatment plant.</li> <li>• Upgrade of water reticulation and pumps.</li> <li>• Minor embankment stabilisation works at Kalingo Dam.</li> <li>• Longer and wider panels A4 and A5.</li> <li>• Extract one additional Longwall Panel A5a (LW A5a) using LTCC</li> <li>• Extension of LTCC Longwall Panel A5a</li> <li>• Extension to Bellbird South development consent area to include Longwall Panels LWB1 to LWB3</li> <li>• Extension of consented activities to 14 Feb 2022.</li> </ul>
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: <ul style="list-style-type: none"> <li>• Longwall production from the Greta coal seam from panels A6 to A17 using longwall Top Coal Caving (LTCC) technology</li> <li>• Construction of a new surface infrastructure site south west of Kitchener including</li> </ul>

Consent Description	Date	Approval Authority	Approved Development
			<p>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.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Continued use of Austar's existing water management, coal transport systems, coal preparation plant and rejects emplacement areas.</li> </ul>
Project Approval 08_0111 (Modifications)	4 May 2010 (MOD 1)	Delegate for Minister for Planning	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• Extension of longwalls A7 to A10 to the west by approximately 100m and 300m</li> </ul>
	13 March 2012 (MOD 2)	Delegate for Minister for Planning	
	17 Dec 2013 (MOD 3)		
DA 8/2012/503/1	19 Dec 2012	CCC	<ul style="list-style-type: none"> <li>• Extension of car parking area associated with Austar Coal Mine</li> </ul>

### 1.3.2 Subsidence Management Plan / Extraction Plan

Austar holds an approved combined Subsidence Management Plan (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.

An 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 Subsidence Management Plan approval on 3 June 2013 by the Division of Resources and Geoscience (DRG). The

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 DRG. A variation to the SMP was approved by DRG 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 prepared in consultation with the relevant government agencies, and was approved on 4 July 2016. An Extraction Plan for LWB4 to LWB7 was in preparation during the 2016-2017 AEMR period.

A summary of Extraction Plan / SMP approvals for Bellbird South (LWB1-LWB3) and Stage 3 mining areas held by Austar is outlined in **Table 1-3**. Previous SMP approvals for the Bellbird South Stage 2 area are also shown 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	DRG	Subsidence Management Plan approval for Austar Colliery Longwall A3 only
SMP Approval 08/2956	24 Dec 2009	DRG	Subsidence Management Plan approval for Austar Colliery Longwalls A4-A5
SMP Approval 10/22	27 April 2011	DRG	Subsidence Management Plan approval for Austar Colliery Longwall A5a
SMP Approval 10/22	7 May 2012	DRG	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	DRG	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	DRG	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	DRG	Subsidence Management Plan approval for retraction to LWA9 commencing end
Extraction Plan LWB1 to LWB3	4 July 2016	DPE	Extraction Plan for Bellbird South Longwalls B1 to B3 was approved by DPE on 4 July 2016

### 1.3.3 Mining Leases

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

**TABLE 1-4 MINING LEASES**

Mining (Act)	Title	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	01/08/2036	1.973	Yes	Surface to 7.62 metres
Mining Purposes Lease No. 269 (1906)	07/12/1917	07/12/2018	2.79	Yes	Surface to 6.1 metres below the level of the rails when laid
Mining Purposes Lease No. 1364 (1906)	28/10/1968	28/10/2029	0.4527	Yes	Surface to 15.24 metres
Consolidated Coal Lease No. 728 (1973)	10/10/1989	30/12/2023	3296.8	Various	Various
Consolidated Coal Lease No. 752 (1973)	23/05/1990	30/12/2023	3802	No (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	02/04/2038	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 that Austar's dewatering bore licences [20BL171481, 20BL173349 and 20BL173350] will expire during the 2017-2018 AEMR period. DPI-Water were contacted regarding these licences. DPI-Water indicated these licences did not require renewal and they will be regulated under the *Water Management Act 2000* and will be replaced by a Water Access Licence in due course. Austar holds a single Water Access Licence under the *Water Management Act 2000*.

**TABLE 1-5 WATER LICENCES**

Licence Held	Licence Number	Validity of Licence	Purpose of Licence	Water Source and Extraction Limit
Bore Licence Certificate	20BL171481	17 Aug 2012 – 16 Aug 2017	Dewatering (groundwater) (No 2 Shaft Borehole Pump)	North Coast Fractured and Porous Rock Groundwater Sources - Sydney Basin – North Coast Groundwater Source. 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
Water Access Licence	20AL210298 / WAL19181	Continuing	Unregulated River Water Licence	Hunter Unregulated and Alluvial Water Sources - Upper Wollombi Water Source - Congewai Creek Management Zone. 10 shares

### 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). A MOP for the period November 2015 to November 2022, was endorsed by DRE on 27 November 2015. The approved MOP covers underground mining, coal handling and other associated activities, and was in place during part of the 2016-2017 AEMR period.

A new MOP was submitted in June 2016, in response to the modification approval to DA29/95 in January 2016. The new MOP was prepared for 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 (LWB4 to LWB7) to allow future extraction of longwall panels prior to returning to the Stage 3 area. The new MOP was approved by DRE on 9 September 2016. All mining activities at Austar were carried out generally in accordance with the relevant approved MOP during the reporting period.

At the end of the AEMR period, Austar's LWB4-B7 modification application was in process. It is intended that upon determination of the modification that a new MOP will be submitted to DRG in the 2017-2018 AEMR period. The new MOP will also detail changes to proposed tailings disposal borehole locations within the Pelton underground workings.

### 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. In January 2015, Austar submitted updated versions of six of the below plans after a revision. In April 2017, Austar submitted updated versions of seven of the below plans after a further revision, to which DPE has provided comments. Austar will continue to progress these plans in consultation with DPE and other relevant agencies during the next AEMR period.

**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

Plan	DA Requirement	Approval Authority	Approval Date
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
Austar Coal Mine Longwalls B1 to B3 Extraction Plan, May 2016	DA29/95 - Schedule 3 Condition 3A	DPE	4 July 2016

Environmental management plans are available from the Austar website ([www.austarcoalmine.com.au](http://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 / Jared King	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

DRG reviewed the 2015-2016 AEMR and conducted an inspection on 2 May 2017. A formal response was provided after the inspection on 15 June 2017, this information is presented in **Table 1-8**.

DPE noted receipt of the 2015-2016 AEMR after its submission. A formal response was provided on 17 January 2017, the comments are provided in **Table 1-9**.

**TABLE 1-8 ISSUES/ACTIONS FROM DRG SITE INSPECTION**

Item	Issue / Action	Addressed
<b>Aberdare Reject Emplacement Area</b>		
Issue 1	The Department requests that results of monitoring undertaken against the rehabilitation completion criteria for the Aberdare Reject Emplacement Area as presented in the Mining Operations Plan is reported in the rehabilitation section of future AEMR's.	In response to comments from DRE during a routine site inspection, Austar has established three 2m x 2m quadrats within the Aberdare Extended Reject Emplacement Area on 5 May 2017. These areas were selected to be representative of the nearby levels of regrowth and will be monitored against the completion criteria as defined in the Austar MOP. Austar will continue to monitor the quadrats into the next reporting period.
Issue 2	Coal in reject and history of reject heating at the Aberdare East is an ongoing spontaneous combustion risk. Austar is to either remove and reprocess reject piles with higher volumes of coal, or relocate the coal containing piles to be buried deeper in the emplacement and manage appropriately to ensure it does not present a spontaneous combustion risk. Action to be completed by <b>1 September 2017</b> .	The Austar site inspection determined that two piles of coal reject had a higher volume of coal present. The two piles containing the coal were moved back to the ROM stockpile for reprocessing on 22 May 2017.
<b>Kitchener Surface Infrastructure Site (SIS)</b>		
Issue 3	Vegetation cover on the Western Cuttings Stockpile at the Kitchener Surface Infrastructure Site is poor. Austar Mine is to investigate constraints to vegetation establishment and development, and implement remedial actions to ensure this area maintains a vegetation cover as per the "Landscape Management Plan - Kitchener SIS" prepared by AECOM 2013. Action to be completed by <b>1 June 2018</b> .	Austar has completed soil analysis at the Kitchener Surface Infrastructure Site including the Western Cuttings Stockpile. Further actions to improve vegetation establishment and development will continue in the next AEMR period.

Item	Issue / Action	Addressed
<b>Paxton Pit top</b>		
Issue 4	Hydrocarbon contaminated material was observed running off a hardstand area and the oil water separator appeared to have reached capacity or failed during a site inspection. Procedures for pollution controls at the Paxton Pit Top are to be revised to ensure that hydrocarbon material does not exit hardstand containment. Action to be completed by <b>1 September 2017</b> .	Austar addressed this by communicating the care required during cleaning procedures at the hardstand area to the personnel responsible for area to ensure hydrocarbon contaminated material is appropriately contained. The Diesel and Surface Infrastructure Coordinator confirmed a missed monthly service of the separator due to the vacuum truck company changing depots. The separator was subsequently serviced, and continues to be serviced on a monthly basis.

**TABLE 1-9 ISSUES/ACTIONS FROM DPE SITE INSPECTION**

Item	Issue / Action	Addressed
<b>AEMR 2015-2016</b>		
Issue 1	The Department requests that a site water balance detailing water usage at the site is included in the 2016-2017 ARR. This water balance should be in accordance with the Minerals Council of Australia's Water Accounting Framework Input Output model.	The site water balance at Austar is undertaken using the water balance method included in the Site Water Management Plan. This includes underground water movements, and water introduced to the underground. The Water Accounting Framework method has not been used at Austar for the 2016-2017 AEMR period.
Issue 2	It is noted that the Austar meteorological station was out of service during September 2015. It is a requirement of PA08_0111 Schedule (Sch.) 4 Condition (Cond.) 7 and DA 29/95 Sch. 3 Cond 20 that a met station is operating in the vicinity of the project. This equates to only a 91.8% data capture for rainfall, temperature, wind speed and wind direction for the Annual Review period and is considered by the Department as a non-compliance with the monitoring frequency provided in Table 2.6 of the Air Quality and Greenhouse Gas Management Plan. The Department requests that a brief report be provided by 24 February 2017 summarising actions undertaken to resolve the issue and what contingencies ACM have installed to prevent re-occurrence.	Austar provided a response to DPE 23 February 2017. Austar confirmed that the station had stored data up to the 8/9/2015 but ceased to store data for the rest of the month, it was noted that wind data which is used for dust and noise compliance purposes was recorded by additional logging equipment and there was no wind data loss during that period. In response to the issue, Austar's Environment and Community Coordinator checked and found the system to be operating normally on 1 October 2015. The computer hardware that backs up the weather data was also updated in April 2016. As a contingency, Austar has increased the frequency at which the data will be download from the station to include an interim fortnightly check to limit potential data loss between monthly backups.

Item	Issue / Action	Addressed
Issue 3	Depositional dust gauge five (5) was contaminated eight (8) of the twelve times during the annual review period. This equates to 66% data loss at this gauge. The Department requests that ACM review the type and/or location of this gauge to minimise future contamination.	Austar reviewed dust gauge five (5) and found that the dust gauge currently has bird “ring” deterrent installed. Bird spikes were added to dust gauge five (5) to further minimise the potential of contamination by birds. Austar notes that 5 of 6 samples taken from July to December in 2016 were free from contamination.
Issue 4	Modification 6 of DA29/95 was approved 29 January 2016. As per Sch. 2 Cond. 7, it is a requirement that revision and review of all relevant management and monitoring strategies, plan and programs be undertaken. It not already completed, please revise and review all relevant management and monitoring strategies, plans and programs as required by the condition and submit for review to the Department by 31 March 2017.	Austar requested an extension to the timeframe requiring revision and review of all the relevant management and monitoring strategies, plans and programs. Austar was granted the extension from 31 March 2017 to 30 April 2017. Austar submitted the revised and updated strategies, plans and programs on 28 April 2017, comments on the plans were received from DPE, DRG and DPI-Water, with revision and further consultation on the plans ongoing at the end of the AEMR period.
Issue 5	It was noted during the review of the ARR that ACM website did not contain an updated complaints register. As at 17 January 2016, the complaint register on the website was last updated September 2016. Please ensure as per the requirements of Sch. 7 Cond. 9(d) of PA08_0111 that the register is updated on a monthly basis.	Austar updated the website complaints register in response to this issue.
Issue 6	Please note that the 2015-2016 ARR does not contain a statement of compliance as per the recently published Annual Review Guideline (October 2015) (Table 2 and Table 3, page 6 of the Guideline). The Department requests that a statement of compliance is provided in the next report (2016-2017 ARR).	Austar has included the Statement of Compliance in the 2016-2017 AEMR.



## 2 Operations during the Reporting Period

### 2.1 Exploration

Five exploration drilling boreholes were completed during the 2016-2017 reporting period within Exploration Licence EL6598 (Refer to **Plan 3A**). In each case the relevant exploration activity approval was sought and granted from DRG prior to commencement. The exploration boreholes were fully grouted and the sites rehabilitated at completion of drilling activities.

During the 2017-2018 reporting period it is planned to undertake further exploration boreholes and geophysical surveys (ground magnetic survey and a seismic survey).

### 2.2 Land Preparation

Land preparation activities were undertaken in the 2016-2017 AEMR period to establish tailings boreholes as shown in **Plan 3D**. Land preparation included minor track preparation and drill pad preparation. This typically involved minimal clearing of understorey vegetation.

### 2.3 Construction

Construction activities relating to the tailings boreholes shown in **Plan 3D** were carried out at Austar during the 2016-2017 reporting period. This involved establishing pipelines and communications to the tailings boreholes.

### 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. No mining was completed in the Stage 3 area during the 2016-2017 AEMR reporting period. Development mining is planned to return to Stage 3 area in the next reporting period.

#### Bellbird South Area

Extraction of longwall B2 commenced 4 July 2016 and was completed 3 February 2017. The longwall was then moved to longwall B3 where extraction began 11 March 2017, with completion of LWB3 extraction planned to occur in the next reporting period. Extraction of longwall B4 and B5 is planned to commence in the next reporting period (subject to approval of the LWB4-B7 modification and extraction plan).

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 2016-2017 reporting period.

Mining undertaken in the 2016-2017 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	2015-2016 Reporting Period	2016-2017 Reporting Period	2017-2018 Reporting Period (Prediction)
<b>Topsoil stripped</b>	T	0	0	0
<b>Topsoil used/spread</b>	T	0	0	0
<b>Processing waste</b>				
<b>Fine Tailings</b>	m <sup>3</sup>	83,300	334,900	340,000
<b>Coarse Reject</b>	T	7,130t	16,484	20,000
<b>ROM Coal Mined</b>				
- <b>Development</b>	T	272,018	259,826	180,974
- <b>Longwall</b>	T	0	1,852,236	1,865,932
<b>Total ROM</b>	T	272,018	2,015,187	2,046,906
<b>Product Coal</b>	T	258,236	1,950,724	1,840,795

The provisional mine production in the AEMR for the 2016-2017 reporting period estimated approximately 1.98 Mt ROM coal mined and approximately 1.78 Mt product coal. Coal production at Austar during the reporting period was slightly higher than predicted due to good development and longwall mining progress. Total ROM mined in the 2016-2017 reporting period was within approved production limits of DA29/95. Forecast production in the 2017-2018 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 conveys 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 2016-2017 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 were installed in 2016-2017 (as shown on **Plan 3D**) and others will be in subsequent reporting periods in accordance with the Mining Operations Plan.

## **2.7 Waste Management**

Waste management at Austar is undertaken using licensed waste contractors (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.

Waste reports provided by the waste contractors 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 2016-2017 REPORTING PERIOD (TONNES)**

	Paper & Cardboard	Chemical Anchors	Oily Filters	Oily Water	Waste Oil	Fluorescent Tubes	Timber	Medical & Sanitary	Oily Rags	Mixed Solid Waste
<b>TOTAL</b>	7.62	4.74	1.07	-	33.90	-	13.50	0.39	0.16	517.41

Metals collected in the 2016-2017 reporting period are documented in **Table 2-3**.

**TABLE 2-3 SCRAP METAL DATA FOR THE 2016-2017 REPORTING PERIOD**

Metal	Total Weight (Tonnes)
Scrap Steel (JR Richards)	336.26
<b>TOTAL</b>	<b>336.26</b>

Close the Loop® collect and recycle printer cartridges from site. Cartridges collected in the 2016-2017 reporting period are documented in **Table 2-4**.

**TABLE 2-4 PRINTER CARTRIDGES COLLECTED FOR THE 2016-2017 REPORTING PERIOD**

Printer Cartridges	Total Weight (Kilograms)
Cartridge	30.54
Inkjet	0.20
Other	43.24
<b>Total Diverted from landfill</b>	<b>73.98</b>

### 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. 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.

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. Further updates to the SWMP have been submitted in January 2015, and April 2017.

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 EPL 416 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 2016)	At end of reporting period (30 June 2017)	Storage capacity
<b>Clean water</b>			
Doyle Street Dam	5 ML	4	5 ML
<b>Dirty water</b>			
Precipitate Dam	8 ML	8	8 ML
Process Water Dam	54.6 ML	25.2	70 ML
Number 7 Dam	84 ML	50	100 ML
Water Pollution Control Ponds	0 ML	N/A	8 ML
Storm Water Retention Dam	0 ML	0	10 ML
Water Pollution Control Dam	4 ML	4	40 ML
Emergency Overflow Dam	0 ML	0	40 ML
Kalingo Dam	94.6 ML	33	110 ML
Austar Dam	25.6 ML	3.5	35 ML
Kitchener SIS Water Storage Dams	- ML	1	5 ML
Kitchener SIS Eastern Sediment Basins	- ML	0	1.6 ML
<b>Controlled discharge water</b>			
SW6 Discharge to Bellbird Creek	1 ML	0.5	1 ML Tank
<b>Contaminated water</b>			
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](http://www.austarcoalmine.com.au).

## Underground Pumping

There are two (2) underground pumping systems that can 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 was 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 as calculated from monthly flow rates and volumes for the annual licence period is provided in **Table 2-6**.

**TABLE 2-6 INCIDENTAL GROUNDWATER INTERCEPTION AT AUSTAR**

Water Licence No.s	Water sharing plan, source and management zone	Entitlement (ML/year)	Passive take / groundwater interception (ML)
20BL171481 20BL173349 20BL173350	North Coast Fractured and Porous Rock Groundwater Sources	770	699.7

The total incidental groundwater interception of 699.7 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 greater than the 280 ML recorded for the 2015-2016 reporting period, and similar to but greater than the predicted take of 550ML prepared for the LWB1-B3 Environmental Assessment for DA29/95 MOD 6. A further groundwater assessment completed for the LWB4-B7 modification in May 2017 predicted groundwater take of approximately 730ML.

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 was installed in the LWB1-LWB3 mining area (MB03) 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.

Austar is required by Development Consent DA29/95 to review the groundwater impacts of the development in the 2017-2018 AEMR period (by end of February 2018). The review will be undertaken to validate the impact predictions in specific Environmental Assessments for DA29/95 including groundwater levels and quality in alluvial and non-alluvial aquifers, mine inflow sources and volumes. The review will also evaluate the effectiveness of the existing groundwater model for use in current and future mining operations, and also evaluate the effectiveness of any approved Extraction Plan or Water Management Plan.

#### 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 1,729,017 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.

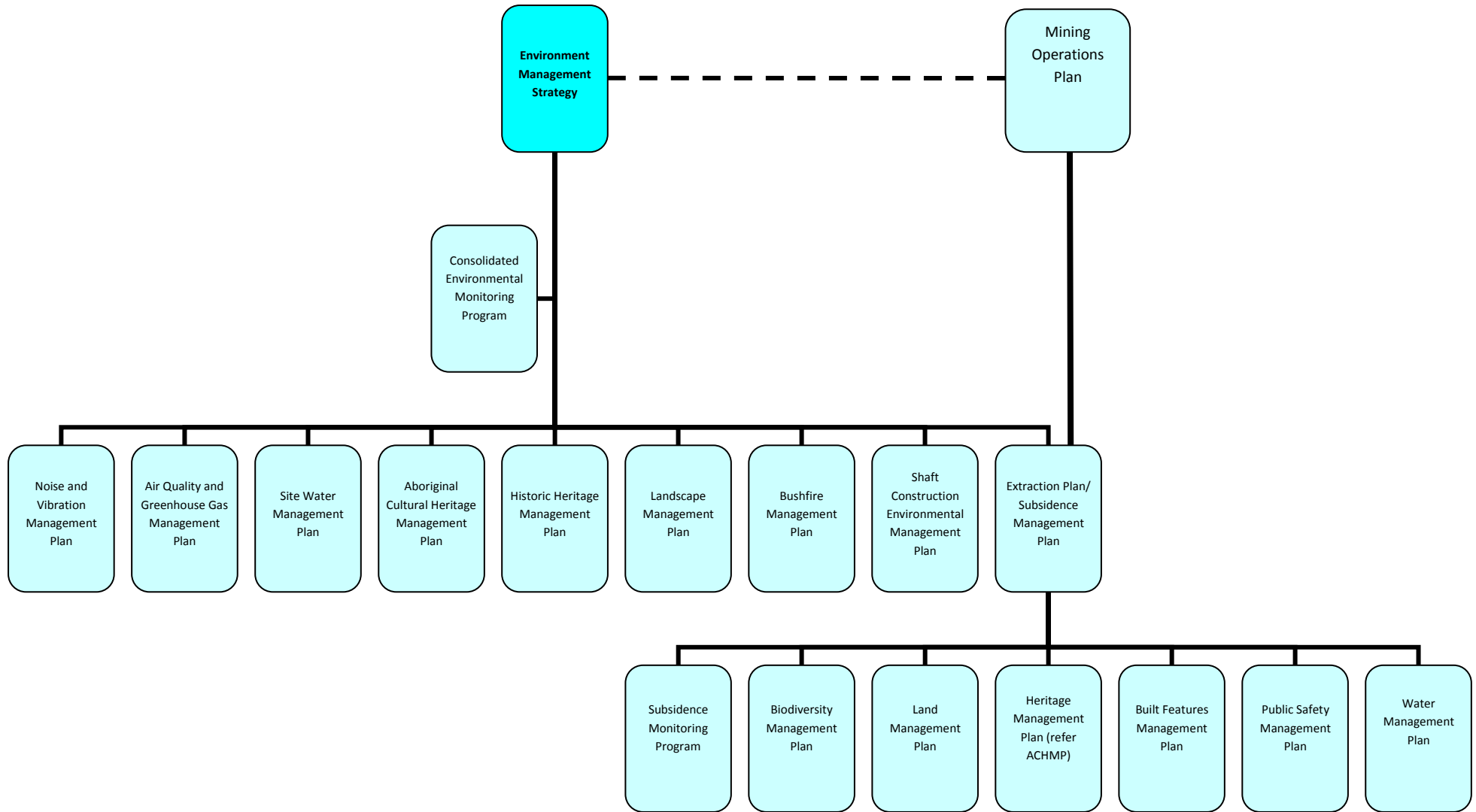
During the 2016-2017 AEMR reporting period no product coal was transported by road haulage.

### 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 2016-2017 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 Annual survey in LWB1-B3 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 2016-2017 reporting period.

#### 3.2.1 Rainfall

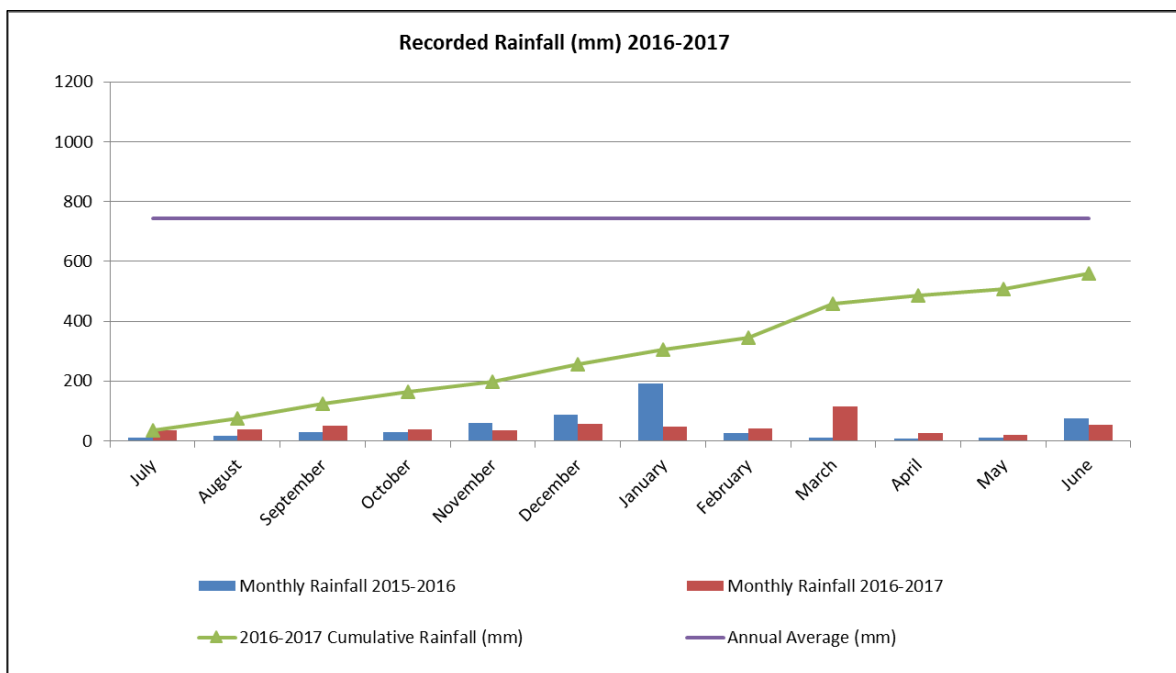
The total monthly rainfall (mm) and number of rain days during the reporting period is shown in **Table 3-2** and **Figure 3-2**. A total rainfall of 558.6mm was recorded during the 2016-2017 reporting period. This represents an increase of 0.4mm from the 2015-2016 total of 558.2mm. Additionally, it



is 183.8mm below the annual mean rainfall for the Cessnock region of 742.4mm (Bureau of Meteorology Cessnock Airport AWS 1968 - 2016).

**TABLE 3-2 RECORDED RAINFALL 2016-2017**

Total Monthly Rainfall (mm)												
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
35.6	39.0	50.2	38.8	35.8	58.2	46.4	41.2	114.4	27.0	19.6	52.4	<b>558.6</b>
Number of Rain Days (>0.2mm)												
13	13	14	10	9	8	14	13	20	14	13	19	<b>160</b>



**FIGURE 3-2 RECORDED RAINFALL AT AUSTAR METEOROLOGICAL STATION (MM) 2016-2017**

### 3.2.2 Temperature

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

**TABLE 3-3 MONTHLY MINIMUM AND MAXIMUM TEMPERATURES 2016-2017**

Minimum and Maximum Monthly Temperatures (°C)												
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
<b>Min</b>	-1.2	1.7	4.7	5.4	7.7	12.1	14.9	12.3	12.4	5.7	0.6	3.2
<b>Max</b>	23.8	23.3	24.4	32.1	35.8	39.9	42.3	45.6	32.7	26.8	24.9	18.8

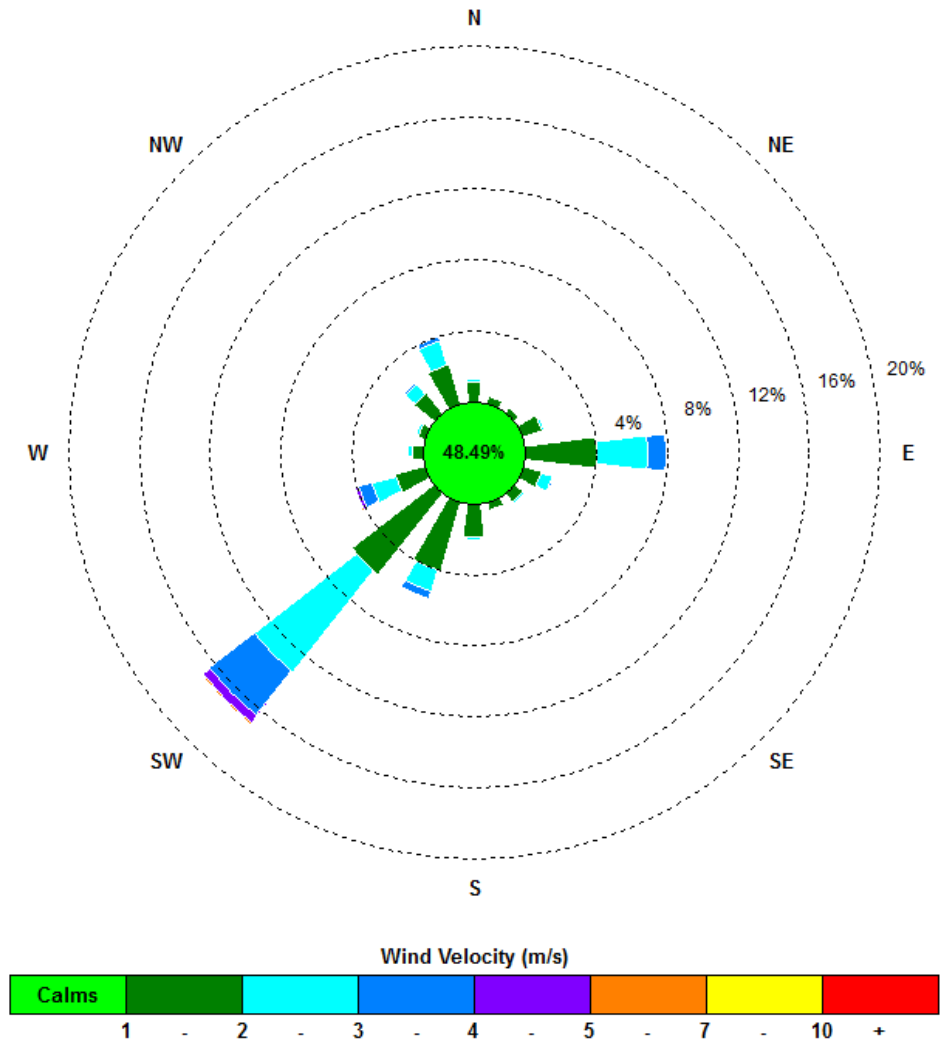
### 3.2.3 Wind Speed

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 2016-2017**

Month	Mean Wind Speed (m/s)	Mean Maximum Wind Speed (m/s)	Dominant Wind Direction
July 2016	1.0	7.6	NNW
August 2016	0.9	7.2	SW
September 2016	0.9	8.0	NNW
October 2016	1.2	9.5	SW
November 2016	1.1	8.6	E
December 2016	0.9	8.2	E
January 2017	1.0	8.2	E
February 2017	1.0	8.5	E
March 2017	1.3	7.8	SW
April 2017	1.0	7.3	SW
May 2017	0.8	6.4	SW
June 2017	1.2	7.1	SW

**2016-2017 WIND DATA**  
1 July 2016 – 30 June 2017



**FIGURE 3-3 MONTHLY AVERAGE WIND ROSE 2016-2017**

### 3.3 Air Pollution

#### 3.3.1 Environmental Management

Austar has prepared an Air Quality and Greenhouse Gas Management Plan (AQGGMP) 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.

During the 2015-2016 reporting period, DPE made comment that depositional dust gauge five (5) was contaminated eight (8) times during the reporting period. In response, Austar has implemented management measures, including bird spikes, to further minimise contamination of the gauge which has resulted in a decrease of contamination with four (4) samples in the 2016-2017 reporting period being contaminated.

The AQGGMP 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 ( $\leq 10\mu\text{m}$ ), or more commonly referred to as  $\text{PM}_{10}$ . 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 ( $\text{PM}_{10}$ )	Pyne Way, Mount View
HVAS 2 ( $\text{PM}_{10}$ )	Ellalong Road, Pelton Village
HVAS 3 ( $\text{PM}_{10}$ )	Coney Creek Lane, Quorrobolong

\*Temporary dust gauge D2A has been discontinued

The air quality criteria for deposited dust, particulate matter  $<10\mu\text{m}$  ( $\text{PM}_{10}$ ) 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 <sup>3</sup>	Annual
	Particulate Matter < 10µm (PM <sub>10</sub> )	30 µg/m <sup>3</sup>	Annual
Short Term Impact Assessment Criterion for Particulate Matter	Particulate Matter < 10µm (PM <sub>10</sub> )	50 µg/m <sup>3</sup>	24 hour
Long Term Impact Assessment Criteria for Deposited Dust	Depositional Dust	2 g/m <sup>2</sup> /month (maximum increase in deposited dust level)	Annual
		4 g/m <sup>2</sup> /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 AQGGMP, 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<sub>10</sub> 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<sup>2</sup>/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 2015-2016 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<sup>2</sup>/month.

**TABLE 3-7 DUST GAUGES ANNUAL AVERAGE**

No	Location	Annual Average Insoluble Solids (g/m <sup>2</sup> /month) 2015/2016	Annual Average Insoluble Solids (g/m <sup>2</sup> /month) 2016/2017
D1	Pyne Way, Mount View	0.9	0.8
D2	Ellalong Road, Pelton Village	1.4	1.4
D3	Bimbadeen Road, Mount View	0.9	1.1
D4	Ellalong Village	2.7	1.6
D5	Kalingo Infrastructure Area (Upcast Shaft 3)	3.3	1.5
D7	Pelton Fire Trail, Quorrobolong	0.9	0.9
D8	Coney Creek Lane, Quorrobolong	0.6	0.9
D9	Kitchener Village	0.9	0.8

Overall, a total of 13 monthly dust deposition gauges were either contaminated with bird droppings/insects, these results were left out of the annual average calculation.

Assessment criterion of a maximum increase of 2g/m<sup>2</sup>/month annual average for deposited dust was undertaken by comparing annual average deposited dust results for 2016-2017 to those from the previous reporting period. All gauges had a difference in annual averages of less than 2g/m<sup>2</sup>/month when compared with dust results from the 2016-2017 reporting period.

#### PM<sub>10</sub> (Fine Dust)

The annual average PM<sub>10</sub> results for the reporting period are provided in **Table 3-8**.

**TABLE 3-8 PM<sub>10</sub> HVAS RESULTS**

No	Location	Annual Average PM <sub>10</sub> (µg/m <sup>3</sup> ) 2015-2016	Annual Average PM <sub>10</sub> (µg/m <sup>3</sup> ) 2016-2017
HVAS1	Pyne Way, Mount View	11.0	11.2
HVAS2	Ellalong Road, Pelton Village	12.5	12.0
HVAS3	Coney Creek Lane, Quorrobolong	9.6	9.8

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<sub>10</sub> results for the reporting period are well below the annual average criterion of 30 µg/m<sup>3</sup> at HVAS1, HVAS2 and HVAS3. Results have remained similar to the previous reporting period of 2015-2016 for HVAS1, HVAS2 and HVAS3.

The measured 24 hour PM<sub>10</sub> did not exceeded the 24 hour maximum criteria of 50µg/m<sup>3</sup> during any monitoring events during the 2016-2017 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 ( $\mu\text{g}/\text{m}^3$ ) 2015/2016	Annual Average TSP ( $\mu\text{g}/\text{m}^3$ ) 2016/2017
HVAS1	Pyne Way, Mount View	27.5	28.0
HVAS2	Ellalong Road, Pelton Village	31.3	30.0
HVAS3	Coney Creek Lane, Quorrobolong	24.1	24.5

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

### **$\text{PM}_{10}$ (Fine Dust) Continuous Dust Monitoring**

A Tapered Element Oscillating Microbalance analyser (TEOM) which measures  $\text{PM}_{10}$  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  $\text{PM}_{10}$  results are provided in **Appendix A**. The annual average from the 2016-2017 reporting period was  $10.1\mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$ .

## **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 2016-2017 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 2016-2017 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.

Rehabilitation works were carried out at the Kitchener Surface Infrastructure Site on a clean water diversion drain in October 2016 including replacing worn geofabric and covering with 200mm ballast rock.

### **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 2016-2017 reporting period, there were no reportable incidents at the Kitchener SIS that involved water overflowing from sediment basins.

Details of environmental incidents 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. On 7 December 2016, the EPL Licence Variation, Condition L3.1 of EPL No. 416, was approved by the NSW EPA to increase the discharge limit for the licenced discharge Point 6, from 2,000KL/day to 5,000KL/day (as an annual average).

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	<ul style="list-style-type: none"> <li><b>SW1</b> – Emergency Dam Spillway, <b>EPL Point 1</b></li> </ul>	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
	<ul style="list-style-type: none"> <li><b>SW2</b> – Bellbird Creek Pinch Bridge, <b>EPL Point 2</b></li> <li><b>SW4</b> – Bellbird Creek Eastern Boundary Downstream of CHPP, <b>EPL Point 4</b></li> <li><b>SW5</b> – Unnamed Creek Western Boundary Upstream of CHPP, <b>EPL Point 5</b></li> </ul>	EC pH Fe TSS	N/A N/A N/A N/A
	<ul style="list-style-type: none"> <li><b>SW6</b> – 1ML tank discharge to Bellbird Creek, <b>EPL Point 6</b></li> </ul>	EC pH Fe TSS Volume	600 $\mu$ S/cm 6.5-8.5 1 mg/L 50 mg/L 5,000 KL/day as annual average
Creeks – Bellbird South UG Mining Area	<ul style="list-style-type: none"> <li><b>SWQ1</b> – Quorrobolong Creek Sandy Creek Road</li> <li><b>SWQ2</b> – Quorrobolong Creek Upstream of Stage 2 Area</li> <li><b>SWQ3</b> – Quorrobolong Creek Downstream of Stage 2 Area</li> <li><b>SWC1</b> – Cony Creek</li> </ul>	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 Bellbird South and Stage 3 areas.

There was no discharge event from SW1 during the reporting period. At the 1ML tank 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 6.57 (SW2) and 7.73 (SW4) which was similar to the 2015-2016 range of pH 6.60 to 7.40;
- Surface water EC ranged between 114 $\mu$ S/cm (SW2) and 8,450 $\mu$ S/cm (SW5), which was similar in the 2015-2016 for SW2 range of 120 $\mu$ S/cm (SW2) to 12,000 $\mu$ S/cm (SW5);

- TSS recorded a maximum of 120mg/L (SW5) with a minimum TSS of 1mg/L (SW4) for the reporting period, the maximum recorded TSS was higher than the 2015-2016 range of <1mg/L (SW2, SW4 & SW5) to 61mg/L (SW5); and,
- Fe (Iron) recorded a minimum of <0.05mg/L (SW2) and a maximum of 26.7mg/L (SW5) for the reporting period, the maximum recorded Fe was higher than the 2015-2016 range <0.05mg/L (SW2) of 19.5mg/L (SW5).

The maximum result for TSS from SW5 (upstream of CHPP influence) was higher than that from the 2015-2016 reporting period and the maximum Fe read went from 19.5mg/L to 26.7mg/L in the 2016-2017 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, with five (5) samples unable to be collected due to the creek being dry.

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 6.80 (SWQ3) and pH 7.93 (SWQ2), which is slightly higher than the 2015-2016 range of pH 6.60 to 7.80;
- EC ranged between 599 $\mu$ S/cm (SWQ3) and 3,170 $\mu$ S/cm (SWQ2), with the minimum EC being significantly higher than the 2015-2016 range of 186 $\mu$ S/cm to 3,810 $\mu$ S/cm;
- TSS recorded a maximum of 388mg/L (SWQ1) with a minimum TSS of 3mg/L (SWQ1 & SWC1) for the reporting period, the maximum TSS was lower when compared to the 2015-2016 range of <1mg/L to 599mg/L; and,
- Fe (Iron) recorded a minimum of 0.452mg/L (SWQ1) and a maximum of 63mg/L (SWC1) for the reporting period, which is significantly elevated compared to the 2015-2016 range of 0.452mg/L to 21.70mg/L.

There were two (2) surface water environmental incidents which were reportable (comprising reportable leak from a mine water or tailings pipeline), and one potential environmental incident which was reported on suspicion during the AEMR period.

For the incident reported on suspicion, the source of the incident was not conclusively determined at the end of the AEMR period. An orange staining/residue was observed within a clean water drainage line at the CHPP site in June 2017. The drainage line is ephemeral and mainly dry with some pool areas. At the time of the identification, it was unclear whether the source of the staining/residue was from a source on site or some other source unrelated to mining. Due to the unknown nature of the incident, the Pollution Incident Response Management Plan was triggered, with relevant agencies being notified and a monitoring program undertaken.

There were several minor water or hydrocarbon spills to land recorded as environmental incidents during the AEMR period also. Details of all the environmental incidents and the actions in response to those incidents are included in **Appendix G**.

### 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 eight (8) piezometers (MB01, MB02, MB03, AQD1073a, NER1010, WBH1, WBH2 and WBH3) to assess impacts on groundwater levels in the Stage 2 and Stage 3 areas. An additional alluvial groundwater monitoring bore (MB03) was installed during 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 contaminants 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 (MB03, 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 between April and June 2017. A general decline in groundwater levels occurred from September 2016 to February 2017, correlating with declining cumulative rainfall departure. Groundwater levels increased throughout March to June from sustained rainfall events.
- Stage 2 NER1010 monitoring bore screened within a non-alluvial hard rock aquifer shows an overall declining trend; however groundwater levels have increased approximately 0.37m after sustained rainfall in March to April of this 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 in Stage 3 monitoring bore MB01 began to decrease suddenly on 19 August 2016. Austar commissioned increased frequency of monitoring and analysis of the decrease. The investigation found there was no additional inflow into the underground mine, the bore is located within a faulted zone, adjacent bores did not display a decrease in water level. The water level continued to decline at a slower rate from September 2016 until June 2017.

MB01 groundwater level had risen coincidentally with June 2017 rainfall events before commencing a decreasing trend once more.

- Monitoring of groundwater level in MB02 commenced in May 2015 and was initially monitored manually. A water level logger was installed in September 2016. This monitoring bore is located over longwall A11 in the Stage 3 area, some distance away from active mining in the reporting period. This bore appears to be screened in a unit of very low hydraulically permeability. This can be observed through very slow recovery rates of the water level between monitoring events where the bore was purged prior to sampling. The purging method for sampling was stopped from March 2017 to attempt to monitor water level without purging interruptions. The groundwater level in monitoring bore MB02 has recovered between April and June 2017 since the purging sampling method ceased.
- Groundwater quality (pH and conductivity) remained relatively stable throughout the reporting period, with the exception of Stage 2 AQD1073A which recorded 5.75pH in Q4 2016 reporting period which is comparable to historic values, and Stage 3 MB02 remain in the alkaline scale. 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 was undertaken during the 2015-2016 reporting 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 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 offsite 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 2016 and Autumn 2017.

There is no rare or threatened fauna or flora species 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, with threatened flora and fauna being known to occur in the area. As such, any land disturbance that is required for the on-going operation will only be undertaken 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 whilst, 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.

### **LWB1-B3 Modification Area**

Baseline surveys ahead of mining longwalls in the LWB1-B3 Extraction Plan Area were undertaken in Spring 2016, specifically focussing on three (3) endangered ecological communities (EEC), Iron-Bark Forest EEC, River-flat Eucalypt Forest EEC and the potentially occurring Quorrobolong Scribbly Gum Woodland EEC, which are all listed under the *Threatened Species Conservation Act 1995*. Although three (3) sites were originally proposed, landowner access was not permitted; therefore no monitoring was undertaken for the area containing potential Quorrobolong Scribbly Gum Woodland EEC. Photo monitoring further supplements this data whilst, providing a visual reference of the baseline condition of the vegetation.

During the baseline survey, two monitoring locations within the subsidence area were surveyed. Baseline monitoring of both sites indicated that each survey site is in varying states of disturbance due to past land use activities, such as grazing. Longwall mining has not commenced in this area and at the time of the baseline surveys, the report indicated that no observed disturbance-related matters were a result of subsidence. The baseline surveys indicated that both monitoring sites are in moderate condition with persistent vegetation in a good state of health.

### **LWB4-B7 Modification Area**

An ecological assessment was undertaken for the LWB4-B7 modification area in late 2016 to record the flora and fauna species diversity, vegetation communities and fauna habitats occurring within the modification area. The ecological assessment also focussed on the identification of any threatened species, endangered populations or threatened ecological communities.

A total of three (3) endangered ecological communities (EEC) were identified within the LWB4-B7 modification area, these being the Lower Hunter Spotted Gum- Iron-Bark Forest EEC, River-flat Eucalypt Forest EEC and the potentially occurring Quorrobolong Scribbly Gum Woodland EEC, which are all listed under the *Threatened Species Conservation Act 1995*. Three (3) threatened bird species and seven (7) threatened mammal species were identified within the LWB4-B7 modification area.

The assessment outlines that the subsidence predictions indicate that no significant adverse impacts to ecological features should occur within the modification area. Longwall mining has not commenced in this area at the time of the ecological assessment.

### **Proposed Tailings Boreholes**

An ecological due diligence assessment was undertaken autumn 2017 by qualified ecologist to seek flexibility for tailings boreholes and the associated pipelines and access tracks. As the area is already approved for impact, this due diligence assessment was carried out to determine the best disturbance footprint options. The assessment area included all of the approved reject emplacement area. The survey identified a total of 84 habitat trees and 13 threatened species as part of the due diligence surveys or as part of survey works being undertaken in tandem. In addition, a bat survey was undertaken in tandem with the ecological due diligence in accordance with Schedule 3, Condition 22 of DA29/95. The bat survey involved the evaluation of potential habitat as well as the use of the Anabat echolocation devices.



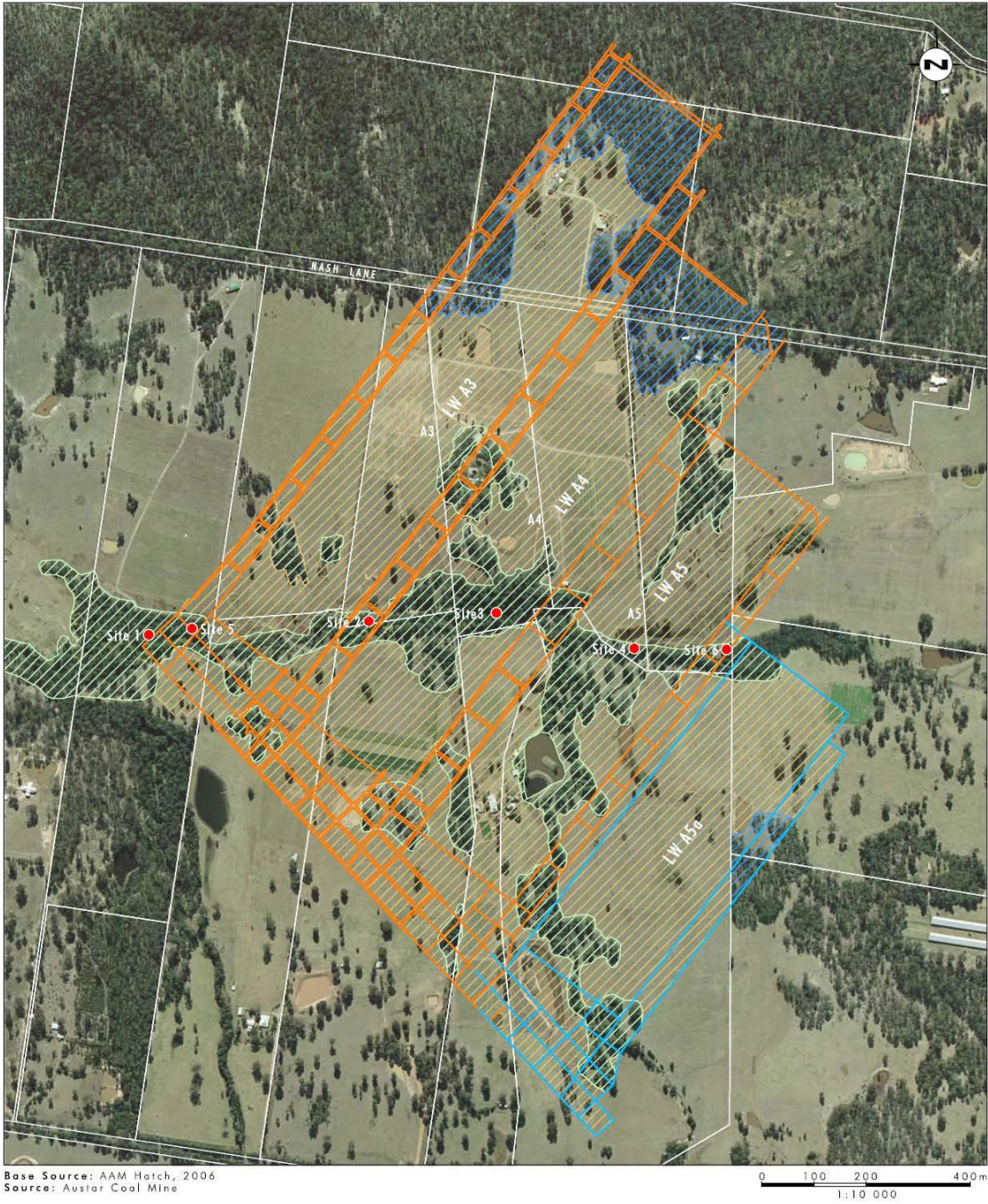
### 3.8.2 Environmental Performance

Ecological monitoring during the 2016-2017 reporting period was undertaken by qualified ecologists during Spring 2016 and Autumn 2017 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, **Figure 3-5** for Stage 3, **Figure 3.6** for LWB1-B3 Extraction Plan Area and **Figure 3.7** for the proposed tailings boreholes.

Ecological monitoring included the following:

- 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 which removed much of the groundcover vegetation. Monitoring during autumn 2017 has observed an increase in diversity coverage of native flora species at the majority of Stage 3 sites. These observations demonstrated that the vegetation across Stage 3 is in the process of recovery as native vegetation responds to bush fire.
- Monitoring site 10 underwent a reduction in tree cover as a result of unauthorised tree clearing being undertaken by non-Austar personnel, it should be noted that these clearing activities were not a result of mining activities.
- 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;
- 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*) and an increase in density of moth vine (*Araujia sericifera*); however less blackberry (*Rubus fruticosus sp. agg*) appears to be present throughout Stage 2 than has been observed in previous years; and
- Baseline monitoring event was undertaken in spring 2016 for LWB1-B3 Extraction Plan Area, with the baseline surveys indicating monitoring sites are in moderate condition with persistent vegetation and in a good state of health
- To date, there is no evidence of any impacts on ecological features as a result of longwall mining.
- The ecological due diligence assessment observed 84 habitat trees and 13 threatened species.
- The additional bat survey confidently identified 14 micro-bat species with a further eight (8) micro-bat species possibly identified using echolocation surveys. One (1) mega-bat species was identified. Ten (10) of these species are listed as vulnerable under the *Threatened Species Conservation Act 1995*.

- Three (3) threatened ecological communities (EEC), three (3) threatened bird species and seven (7) threatened mammal species were identified within the LWB4-B7 Modification Area
- *Grevillea parviflora subsp. parviflora* (*G. parviflora subsp. parviflora*) near the Kitchener SIS was observed to have outgrown the original cordoned off area during a DRE site inspection on 2 May 2017, the area has been extended to encapsulate all the *G. parviflora subsp. parviflora* on 2 May 2017.



**Legend**

- Stage 2 Longwall Panels
- Stage 2 Extension Longwall Panel
- Riparian Swamp Oak - Rough-barked Apple Open Forest (River-flat Eucalypt Forest EEC)
- Spotted Gum - Ironbark Forest (Lower Hunter Spotted Gum-Ironbark Forest EEC)
- Derived Grassland
- Ecological Monitoring Sites

FIGURE 2.1  
Location of Ecological Monitoring Sites

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FIGURE 3-4 LOCATION OF STAGE 2 ECOLOGICAL MONITORING SITES



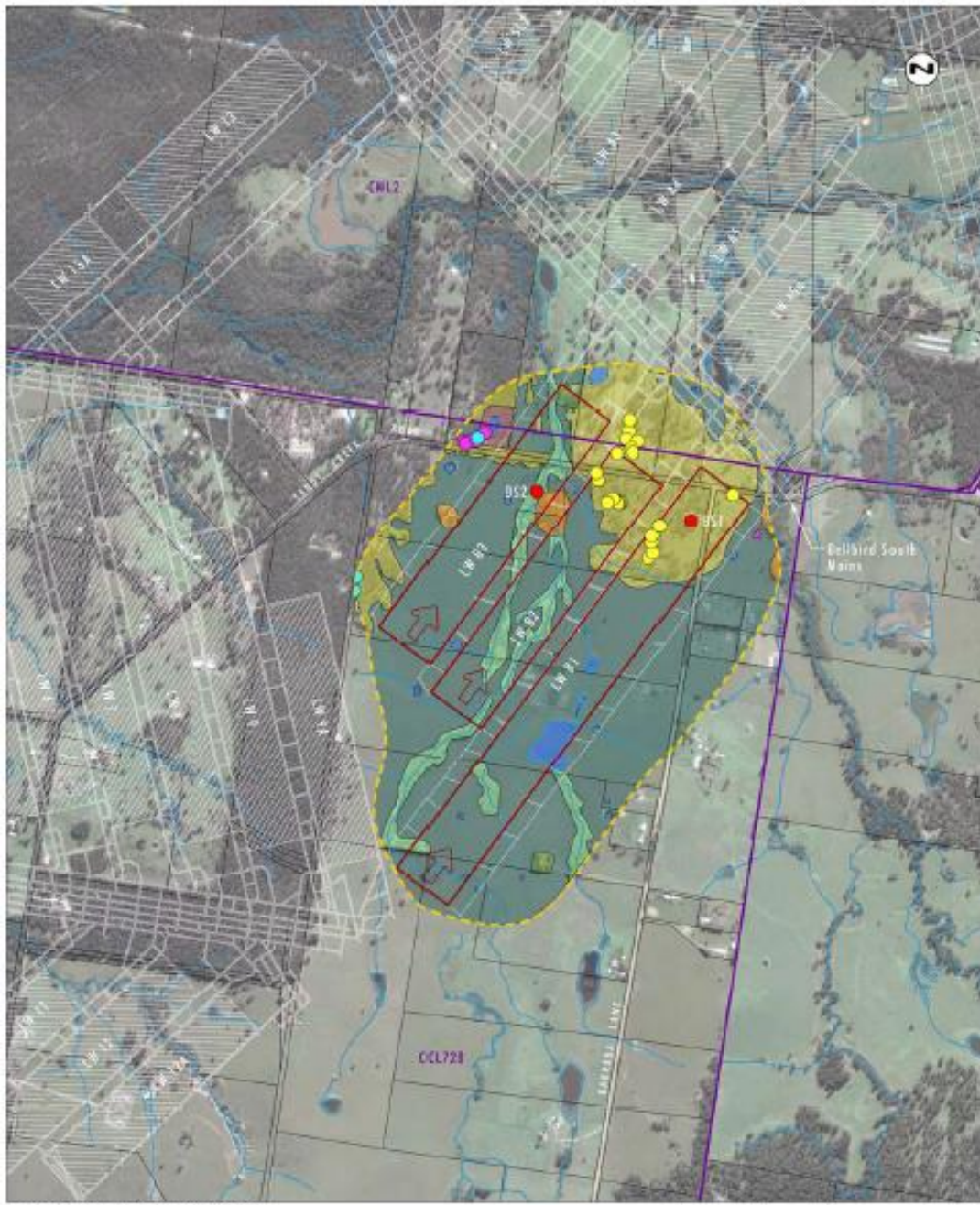


Image Source: Google Earth (2014)  
 Data Source: Austar Coal Mine (2012)

0 0.25 0.5 1.0 km  
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- Legend**
- LWB1-B3 Extraction Plan longwall Panels
  - LWB1-B3 Extraction Plan Area
  - Completed Underground Workings
  - Mining Lease Boundary
  - Direction of Mining
  - Drainage Line
  - Cadastral Boundary
  - Grassland
  - Spotted Gum Ironbark Forest
  - Planted Vegetation
  - Melaleuca Shrubland with Emergent Eccepts
  - Riparian Cabbage Gum Open Forest
  - Riparian Swamp Oak Open Forest
  - Water Body
  - Wet Sock
  - Ecological Monitoring Sites
  - Callistemon linearifolius*
  - Grevillea parviflora* subsp. *parviflora*
  - Pteridium heterogama*

FIGURE 2.1

Location of LWB1-B3  
 Ecological Monitoring Sites  
 and Vegetation Communities

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FIGURE 3-6 LOCATION OF LWB1-B3 ECOLOGICAL MONITORING SITES

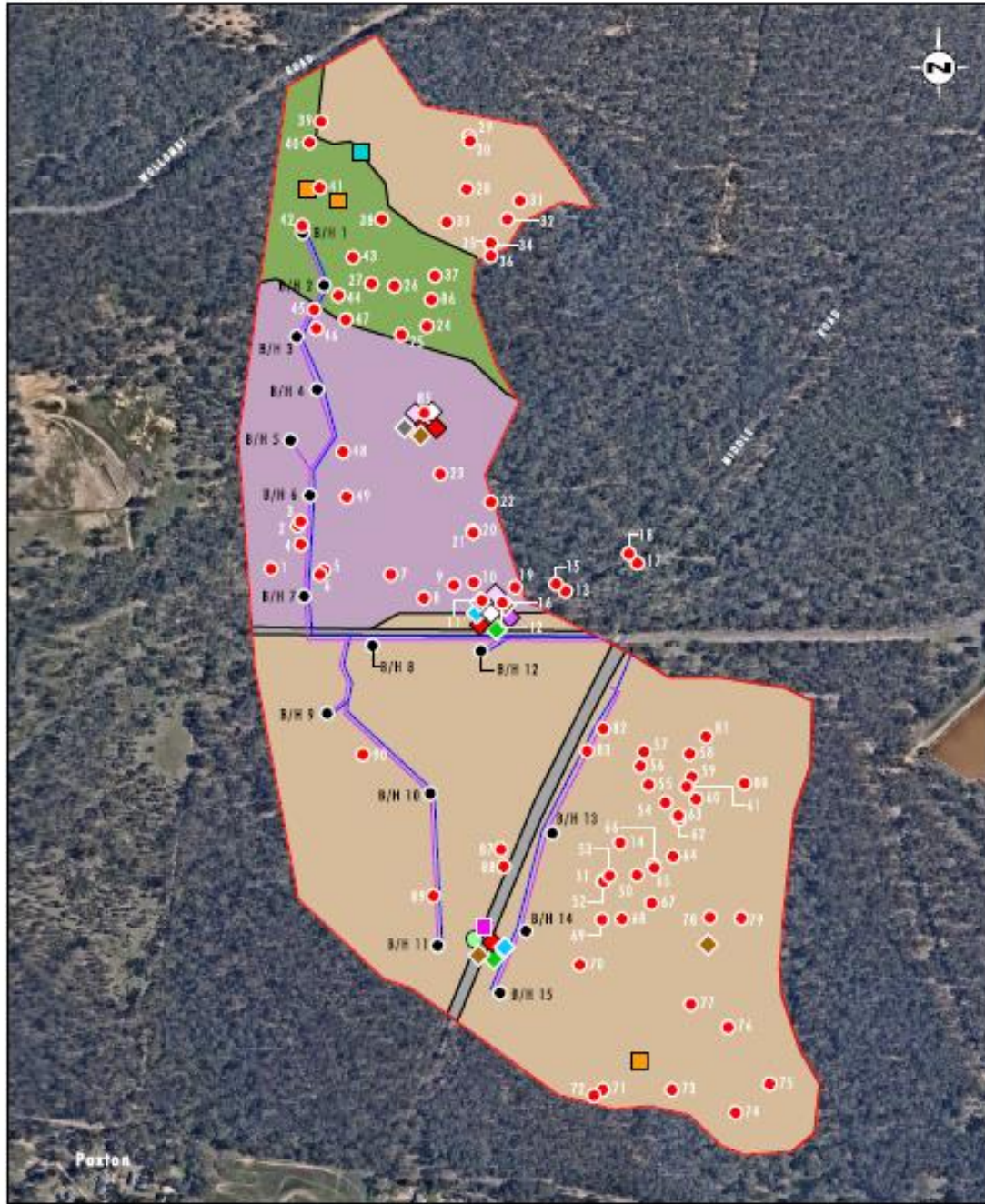


Image Source: Nearmap (2017)

**Legend**

- |  |                                |                                |
|--|--------------------------------|--------------------------------|
| Survey Area                                    | Eastern bantwing-bat           | <i>Rediviva heteropora</i>     |
| Lawn Hunter Spotted Gum - Red Ironbark Forest  | Eastern cave bat               | Proposed Borehole Location     |
| Cobbegs Gum Floodplain Woodland                | Eastern false pipistrelle      | Proposed Tailings Access Track |
| Illalong Grey Gum - Stringybark - Apple Forest | Greater broad-nosed bat        | Proposed Tailings Pipe         |
| Road/Access Tracks                             | Grey-headed flying fox         |                                |
| Hollow-bearing Tree                            | Large-eared pied bat           |                                |
| Barking Owl                                    | Little bantwing-bat            |                                |
| Brown treecreeper (eastern subspecies)         | Southern myotis                |                                |
| East-coast freetail-bat                        | Yellow-bellied sheath-tail-bat |                                |

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**FIGURE 2**  
Proposed Impacts

**FIGURE 3-7** ECOLOGICAL DUE DILIGENCE MONITORING SITES (TAILINGS BOREHOLES)

## 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 alongside Quorrobolong Creek near Sandy Creek Road during June 2017. Works focused on controlling green cestrum (*Cestrum parqui*).

#### Feral Animal Management

There was little evidence of feral animal issues being 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.

Austar have continued to implement the approved Noise and Vibration Monitoring Program (NVMP) with vibration monitors located at 345 Quorrobolong Road, Quorrobolong (V7) and an additional monitor located in the Bellbird South LWB1-B3 area off Sandy Creek Road, Quorrobolong (V9). A temporary vibration monitor was located off Barraba Lane, Quorrobolong (V9a) for a period whilst land access arrangements were negotiated for vibration monitoring at location V9. The new vibration monitoring location V9 was included in an update to the NVMP in April 2017. The location of vibration monitors is shown in **Plan 2**.

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 2016-2017 reporting period.

### 3.10.2 Environmental Performance

Vibration monitoring in the mining area was undertaken during the 2016-2017 reporting period. In general 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 were 85 vibration events recorded during the 2016-2017 reporting period. This is an increase of 73 vibration events compared to the 2015-2016 reporting period where 12 events were recorded. The majority of vibration events were recorded shortly after commencement of Longwall B2, between July and November 2016, after which time the frequency and magnitude of vibration events reduced considerably. Longwall B3 extraction commenced on 11 March 2017 and only five (5) vibration events were recorded up to the end of the AEMR period.

The British Standard provides guideline values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated and where minimal risk of cosmetic damage may occur (15mm/s). The maximum recorded event for the current reporting period was 25.16mm/s, followed by 19.82mm/s, 18.83mm/s and 17.40mm/s, with these four (4) events over the British Standards. Other vibration events recorded significantly less.

Vibrations of this magnitude, have the potential to cause cosmetic damage to buildings (over 15 mm/s). Four (4) vibration events during the 2016-2017 reporting period exceeded the non-mandatory EPA 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 2016-2017 period was in accordance with the NVMP, with the exception of recorded exceedances at monitoring locations C2 and C5.

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
<b><i>Nearest Potentially Affected Receivers to CHPP</i></b>			
<b>C1</b>	South of Bimbadeen Road, Mt View	West of CHPP	L <sub>A90</sub> 40 dB
<b>C2</b>	Pelton Village	South East of CHPP	L <sub>A90</sub> 43 dB
<b>C3</b>	Bimbadeen Road, Mt View	North-west of CHPP	L <sub>A90</sub> 37 dB
<b>C4</b>	84 Bimbadeen Road, Mt View	North of CHPP	L <sub>A90</sub> 37 dB*
<b>C5</b>	43 Doyle Street, Mt View	North East of CHPP	L <sub>A90</sub> 37 dB*
<b><i>Nearest Potentially Affected Receivers to Kitchener Surface Infrastructure Site</i></b>			
<b>K1</b>	Pelton Road, Quorrobolong	South of SIS	L <sub>Aeq</sub> 35 dB / L <sub>A1</sub> 45 dB
<b>K2</b>	Coney Creek Lane, Quorrobolong	East of SIS	L <sub>Aeq</sub> 35 dB / L <sub>A1</sub> 45 dB
<b>K3</b>	Richmond Street, Kitchener	North of SIS	L <sub>Aeq</sub> 35 dB / L <sub>A1</sub> 45 dB
<b><i>Nearest Potentially Affected Receivers to Kalingo Infrastructure Area</i></b>			
<b>K4</b>	Nash Lane, Quorrobolong	East of Kalingo Infrastructure Area	L <sub>Aeq</sub> 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 relevant noise limits at the majority of monitoring locations during the 2016-2017 reporting period with the exceptions of C2 and C5 during July 2016. Activities at the CHPP resulted in noise levels equal to the relevant L<sub>A90</sub> impact assessment criteria at C2 and a 1dB exceedance at C5.

A summary of results from attended monitoring undertaken during the 2016-2017 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 2016-2017**

Quarter	Period	Austar CHPP Only LA90, 15 min (dB)				
		C1	C2	C3	C4	C5
		Noise Criteria	40	43	37	37
3 2016	Night	34	<b>48*</b>	<35	<32	<b>43*</b>
		38	32	32	<30	<b>42*</b>
		30	45*	25	NM	32
4 2016	Night	29	43	<25	<30	31
		35	NM	30	IA	NM
		41	42	37	<30	<35
1 2017	Night	<25	27	NM	NM	<20
		NM	33	NM	NM	<30
		<25	NM	<30	<25	NM
2 2017	Night	32	44*	32	29	31
		28	<b>47*</b>	<b>41*</b>	38*	39*
		31	<b>46*</b>	39*	<b>40*</b>	<b>42*</b>

Note: These are results for Austar CHPP in the absence of all other noise sources;

\* indicates Industrial Noise Policy low frequency modifying factor caused exceedance of noise criteria.

Bolded results indicate exceedance of criteria and met data causes criteria to be applicable.

IA denotes inaudible. NM denotes not measurable.

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.

**TABLE 3-13 AUSTAR SIS ATTENDED NOISE MONITORING RESULTS 2016-2017**

Quarter	Period	Austar SIS Only $L_{Aeq, 15 \text{ min}}$ (dB)		
		K1	K2	K3
	Noise Criteria	35	35	35
<b>3 2016</b>	Night	<25	<25	IA
		<30	<30	IA
		28	26	IA
<b>4 2016</b>	Night	25	<25	IA
		<20	<20	IA
		IA	IA	IA
<b>1 2017</b>	Night	<20	<20	IA
		NM	IA	IA
		IA	IA	IA
<b>2 2017</b>	Night	<25	IA	<25
		<20	IA	<25
		IA	IA	IA

Note: These are results for Austar SIS in the absence of all other noise sources;  
 \* indicates Industrial Noise Policy low frequency modifying factor caused exceedance of noise criteria.  
 Bolded results indicate exceedance of criteria and met data causes criteria to be applicable.  
 IA denotes inaudible. NM denotes not measurable. NA denotes no access to monitoring point.

**TABLE 3-14 AUSTAR KIA ATTENDED NOISE MONITORING RESULTS 2016-2017**

Quarter	Period	Austar KIA Only
		$L_{Aeq, 15 \text{ min}}$ (dB)
		K4
Noise Criteria		35
<b>3 2016</b>	Night	IA
		36*
		25
<b>4 2016</b>	Night	<25
		<20
		IA
<b>1 2017</b>	Night	25
		<25
		<25
<b>2 2017</b>	Night	<25
		24
		27

Note: These are results for Austar KIA in the absence of all other noise sources;  
\* indicates Industrial Noise Policy low frequency modifying factor caused exceedance of noise criteria.  
Bolded results indicate non-compliance of criteria and met data causes criteria to be applicable.  
IA denotes inaudible. NM denotes not measurable.

All recorded exceedances of noise limits from the CHPP or KIA were due to the addition of the low frequency modifying factor. Noise levels measured from the CHPP and KIA were 1-2dB over the noise limit on a total of six (6) occasions, which do not class as a non-compliances, as Chapter 11 of the EPA ‘Industrial Noise Policy’ deems a development to be in non-compliance only when “the monitored noise level is more than 2dB above the statutory noise limit specified in the consent or licence condition.”.

As per the Industrial Noise Policy (INP), the nature of the measured noise indicated that C2 and C5 in quarter 3 of 2016, and C2, C3, C4, C5 in quarter 2 2017 were classified as low frequency and attracted the 5dB modifying factor. When the modifying factor was applied the resultant noise level exceeded the relevant EPL or the adopted Noise and Vibration Management Plan  $L_{A90}$  noise limit. No atypical operations were occurring at the CHPP during the monitoring events. A review of the existing meteorological data indicated that noise limits were applicable at the time of monitoring.

A development is considered to be in breach of a noise consent of EPL licence condition is sustained non-compliances are not addressed and rectified. In response to the exceedance in noise limits, Austar notified the EPA and DPE. Austar reviewed previous reports on the CHPP for potential noise control options and potential low frequency sources, Austar also carried out follow up monitoring

when the CHPP was in operation and the weather conditions suitable. An incident report was submitted to the EPA and DPE.

Details of environmental incidents are included in **Appendix G**.

### **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 four artefact scatters and isolated finds (ACM9, ACM10, ACM14 and ACM35) 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. The ACHMP was distributed for consultation to the Registered Aboriginal Parties and OEH during the reporting period.

### **LWB4-B7 Modification**

An Aboriginal Cultural Heritage Assessment was undertaken in 2017 to assess the Aboriginal Cultural Heritage impacts of the proposed modification LWB4-B7. The assessment identified one (1) existing and 13 new archaeological sites within the modification area.

The majority of the sites within the modification area have been assessed and to be of low archaeological significance, with the exception of ACM38 and ACM40 which were assessed to having a low-moderate archaeological significance, largely based on their research potential. An Aboriginal stakeholder identified that the landscape within the vicinity of LWB4-B7 modification area has a high cultural significance with each site having unique spiritual and cultural values and connections. Quorrobolong Creek within the modification area may hold a low scientific value but holds high importance and cultural significance to the Aboriginal community.

As the modification does not involve surface development, the Aboriginal cultural Heritage Assessment indicated that the potential impacts of the LWB4-B7 modification is limited to indirect impacts associated with subsidence.

## **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 11 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 DRG 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 2016-2017 reporting period.

Coarse reject piles at the Aberdare Coarse Reject Emplacement area experienced heating and emitted odours for a brief period in October 2016, before they were pushed over with a dozer and compacted. This was the cause of three (3) community complaints at that time, refer to **Appendix F**. 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 their respective mining areas.

Austar prepared an Extraction Plan for Bellbird South LWB1-B3 which was approved by DPE on 4 July 2016.

Subsidence monitoring for the Bellbird South LWB1-B3 area at Austar during the reporting period was completed in accordance with the Subsidence Monitoring Program which forms part of the Extraction Plan. Monitoring is conducted in affected areas pre 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. The Extraction Plan for Bellbird South LWB1-B3 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 commenced extraction of Longwall B2 on 7 July 2016 and completed extraction on 3 February 2017. Extraction of Longwall B3 followed beginning on 11 March 2017 and was continuing at the end of the 2016-2017 AEMR period.

Subsidence monitoring has been undertaken in accordance with the Subsidence Monitoring Program. The mine subsidence movements resulting from the extraction of Longwall B2 were monitored using the following:

- Line B2;
- Line Bellbird South Crossline;
- Line SCR1 (Sandy Creek Road); and
- Line BL1 (Barraba Lane).

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

Subsidence monitoring results from Bellbird South have been consistently within the maximum predicted range as shown in displayed in **Appendix E**, with less than 200mm of vertical subsidence

recorded at the completion of LWB2 compared to the maximum predicted subsidence after LWB2 of 250mm. This trend has continued after the commencement of LWB3, with measured subsidence being within predicted levels at the monitoring lines during extraction.

The ground movements, measured along Lines B2, Bellbird South Crossline, SCR1 and BL1, indicate that the observed subsidence, resulting from the extraction of Longwall B2, were generally similar to or less than the maximum predicted. The profiles of observed subsidence also reasonably matched those predicted, but with reduced magnitudes.

During subsidence monitoring inspections, there have been no perceptible impacts to the environment or increases in public safety risk. At the completion of mining LWB2 there was no abnormal behaviour observed that required particular review.

No subsidence management actions were required to be undertaken as a result of B2 extraction during the 2016-2017 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.

One (1) environmental incident occurred that involved a diesel stain being observed on the road after rainfall at No. 2 shaft on 20 March 2017. The diesel stain was quickly attended to with a spill kit and by scraping the gravel off the road for disposal.

During a routine inspection on 2 May 2017 by the DRE, it was noted that the hydrocarbon contaminated material was observed running off a hardstand area and the oil water separator appeared to have reached capacity or failed during the site inspection. In response to DPE, Austar communicated the cleaning procedure to the personnel responsible for diesels, and the oily waste

material was disposed of correctly on 3 May 2017. Further clean ups externally of the building was also undertaken in this 2016-2017 reporting period.

Details of the environmental incident is included in **Appendix G**.

### **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<sub>2</sub> (2016-2017 Average 0.17%) with some CH<sub>4</sub> (2016-2017 Average 0.05%) under normal operating conditions.

### **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, Stage 3 and Bellbird South LWB1-B3 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, Stage 3 and Bellbird South LWB1-B3 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 did not take place during the 2016-2017 reporting period. 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 2016-2017 reporting period a total of 5 complaints were received, a decrease on the 4 complaints in 2015-2016 reporting period. A summary of all the complaints received during the reporting period is provided in **Appendix F**.

Complaints received during the 2016-2017 reporting period were in relation to odour, vibration and surface water. 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 2016-2017 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:

- 23 August 2016;
- 16 November 2016;
- 29 March 2017; and
- 31 May 2017.

**TABLE 4-1 AUSTAR COMMUNITY CONSULTATIVE COMMITTEE (CCC) DURING THE 2016-2017 REPORTING PERIOD**

Organisation/Representative	Name
Independent Chairperson	Ms Margaret MacDonald-Hill
Cessnock Council Representative	Clr Mark Lyons
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 2016-2017 were:

- Current mining operations – underground, CHPP, Kitchener SIS and rehabilitation, Bellbird South Area (including progress of the modification application and environmental assessment for LWB4-B7);
- Environmental monitoring and results;
- Environmental incidents;
- Complaints management;
- Mining Operations Plan 2016-2023;
- Community sponsorships;

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 2016-2017, 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 progress of mining operations discussed as part of this resident consultation.

Landholders over the LWB1-B3 mining area and the proposed LWB4-B7 modification area were consulted with during the preparation of the environmental assessment for the modification application to DA29/95 to permit the extraction of LWB4-B7. 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 within the LWB1-B3 mining area were notified of the approval of the LWB1-B3 Extraction Plan (approved 4 July 2016), the types of monitoring to be undertaken in the Extraction Plan area, and individual landowner specific Built Features Management Plans. During the AEMR period, landholders over the LWB1-B3 Extraction Plan area were provided with the results of monitoring of subsidence and environmental impacts over the mining area.

Landholders over the Stage 3 area were consulted regarding exploration boreholes and geophysical surveys (ground magnetic surveys and seismic surveys) over parts of the Stage 3 mining area. These discussions included a description of the proposed exploration activity, and negotiations for access to private property to undertake the planned works.

Ongoing consultation on mining operations of LWB1-B3, the proposed LWB4-B7 area and for exploration activities will continue in the next AEMR period.

#### **4.2.3 Community Contributions**

During the reporting period, Austar launched a Community Support Program Q3 2016, which was a new initiative. The Community Support Program provides a more formalised process for community groups or programs to apply for funding to assist their community activities and projects. The Community Support Program was advertised in the local newspaper and on the Austar website. Projects and groups sponsored included, but not limited to:

- Hunter Valley Steamfest Maitland;
- Cessnock City Council Mayoral Scholarship;
- Cessnock Youth Employment Program;
- Abermain Public School 2016 Carols by Candlelight;
- Westpac Helicopter;
- Camp Quality;
- Cessnock Regional Art Gallery;
- Cessnock Croquet Club;
- Coalfield Heritage Group;
- Ellalong Public School;
- Coalfields Amateur Swimming Club;
- Heal for Life Foundation;
- Kitchener Poppet Head;
- Kitchener Public School;
- Kurri Early Childhood Centre;
- Stanford Merthyr Public School P&C;
- Central Coast Axeman - 2016 Miners Challenge Memorial Woodchop;
- Cessnock High School - end of year presentation;
- Shamrock Soccer Club;
- Cessnock Rugby League Football Club; and
- 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 DRG. Consultation will continue with Cessnock City Council in the 2017-2018 reporting period.

### 5.2 Rehabilitation of Disturbed Land

Capping works were undertaken in the Aberdare Extended Reject Emplacement Area. An area of 4000m<sup>2</sup> of coarse reject material was capped within the 2016-2017 AEMR period with works in the area to continue in the next AEMR period.

Soil testing to support rehabilitation maintenance activities at the Kitchener SIS was carried out to enable suitable amelioration and seeding to occur within the next AEMR period, including sloped batter areas where some erosion rills have developed.

### 5.3 Other Infrastructure

No rehabilitation activities other than the works outlined in **Section 5.2** were carried out during the 2016-2017 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.

During a routine inspection on the 2 May 2017 by DRE, it was noted that there appeared to be higher volumes of coal within the Aberdare Reject Emplacement Area, where ongoing spontaneous combustion risks occur. In response, Austar carried out a site inspection with the CHPP Quality Coordinator and Environment and Community Coordinator. The site inspection determined that two (2) piles of reject had a higher volume of coal present. The two (2) piles containing the coal were moved back to the stockpile for reprocessing on 22 May 2017. DRE also noted the lack of quantifiable rehabilitation results at the Aberdare Extended Reject Emplacement Area during the site inspection. In response, Austar cordoned off three (3) quadrats on 5 May 2017. These areas were selected to be representative of the nearby levels of regrowth and will be monitored against the completion criteria as defined in the MOP. Austar will continue to monitor the quadrats into the next reporting period.

Rehabilitation works have begun at the Aberdare Extended Reject Emplacement Area during the 2016-2017 reporting period with capping of material being undertaken in December 2016. The rehabilitation works in the Aberdare Extended Reject Emplacement Area is ongoing and will continue into the 2017-2018 reporting period.

Further research to be undertaken in the 2017-2018 reporting period 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 after consultation with DRG. 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 (Ha) (2015-2016)	This Reporting Period (Ha) (2016-2017)	Next Reporting Period (Ha) (2017-2018)
Total Mine Footprint	181.15	182.01	182.42
Total Active Disturbance	137.08	137.94	134.90
Land being Prepared for Rehabilitation	0.00	0.00	0.00
Land under active Rehabilitation	44.07	44.07	47.50
Completed Rehabilitation	0.00	0.00	0.00

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**

Nature of Treatment	Area Treated (ha)		Comment/Control Strategies/Treatment Detail
	Report Period	Next Period	
Additional erosion control works (drains re-contouring, rock protection)	0.5	1.0	Rock-lined drains were constructed at Kitchener SIS 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 2017-2018 reporting period, as outlined in **Table 6-1**.

**TABLE 6-1 PROPOSED ACTIVITIES FOR 2017-2018 REPORTING PERIOD**

Activities Proposed in 2017-2018 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	Finalisation of Phase 1 Contamination Assessment for all Surface Mining Lease areas.
4	Submission of a new MOP including additional tailings boreholes to Pelton underground workings and installation of those boreholes in accordance with the new 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.
9	Revision of any strategies, plans and procedures relevant to the 2017-2018 reporting period.

# Plans

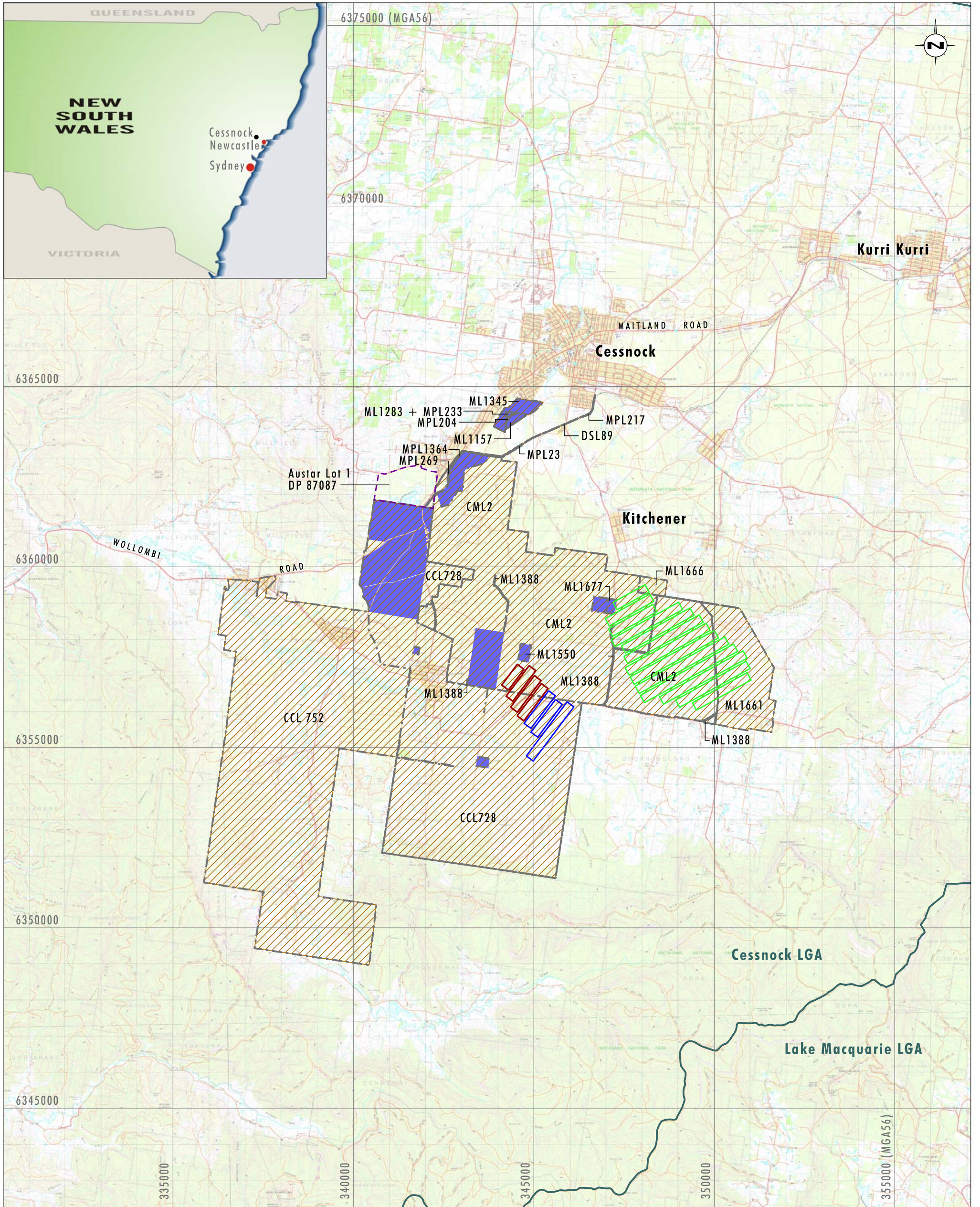


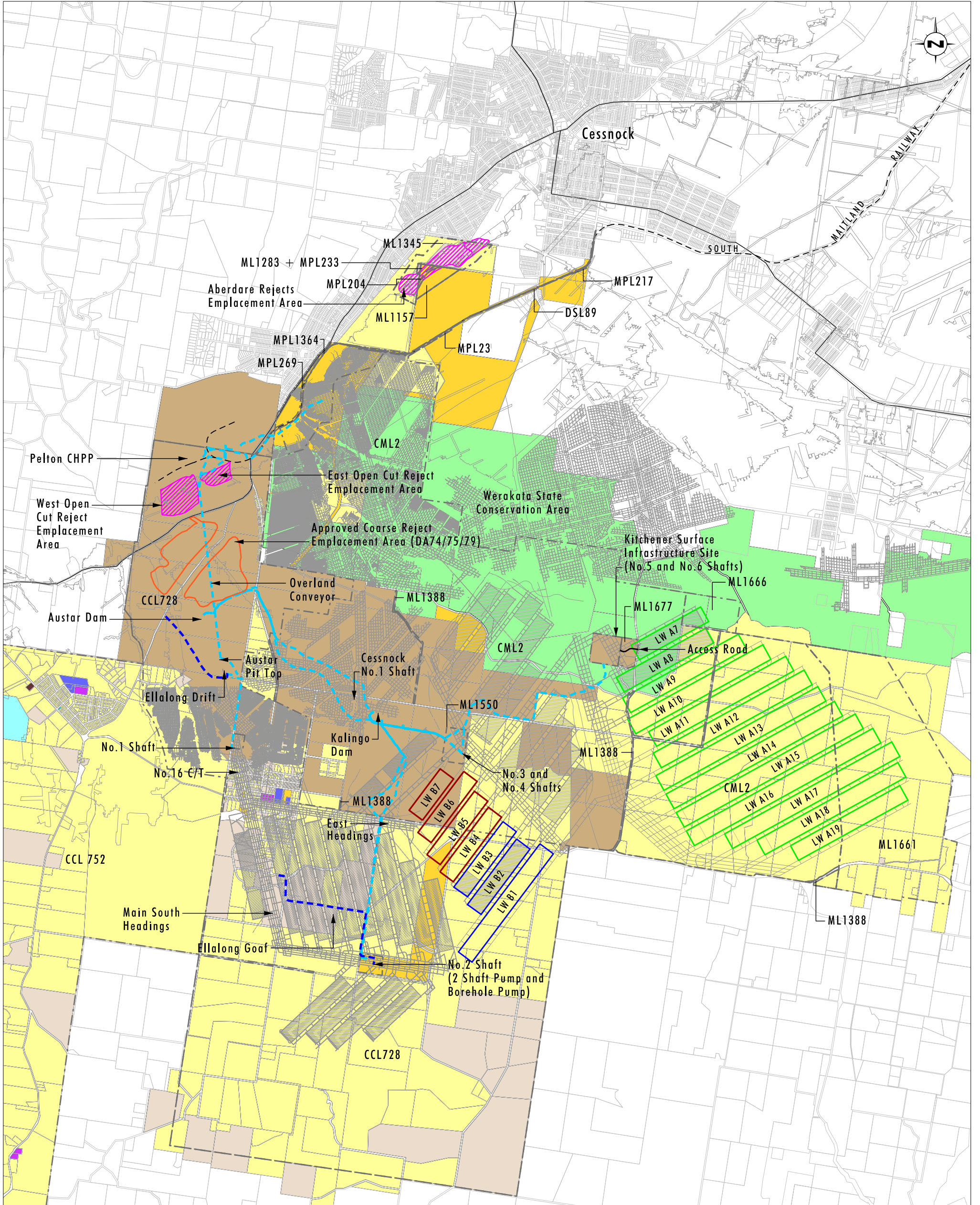
Image Source: Department of Land (2006)  
 Data Source: Austar Coal Mine (2015)

0 1 2 5km  
 1:100 000 (at A3)

**Legend**

- B1-B3 Extraction Plan Longwall Panels (DA29/95 MOD6)
- Proposed B4-B7 Longwall Panels (DA25/95 MOD 7)
- Layout for Stage 3 Longwall Panels (PA08\_0111 MOD3)
- Local Government Area Boundary
- Mining Lease Boundary
- Surface Lease
- Sub Surface Lease
- Austar Lot 1, DP 87087

File Name (A3): 3504\_116.dgn



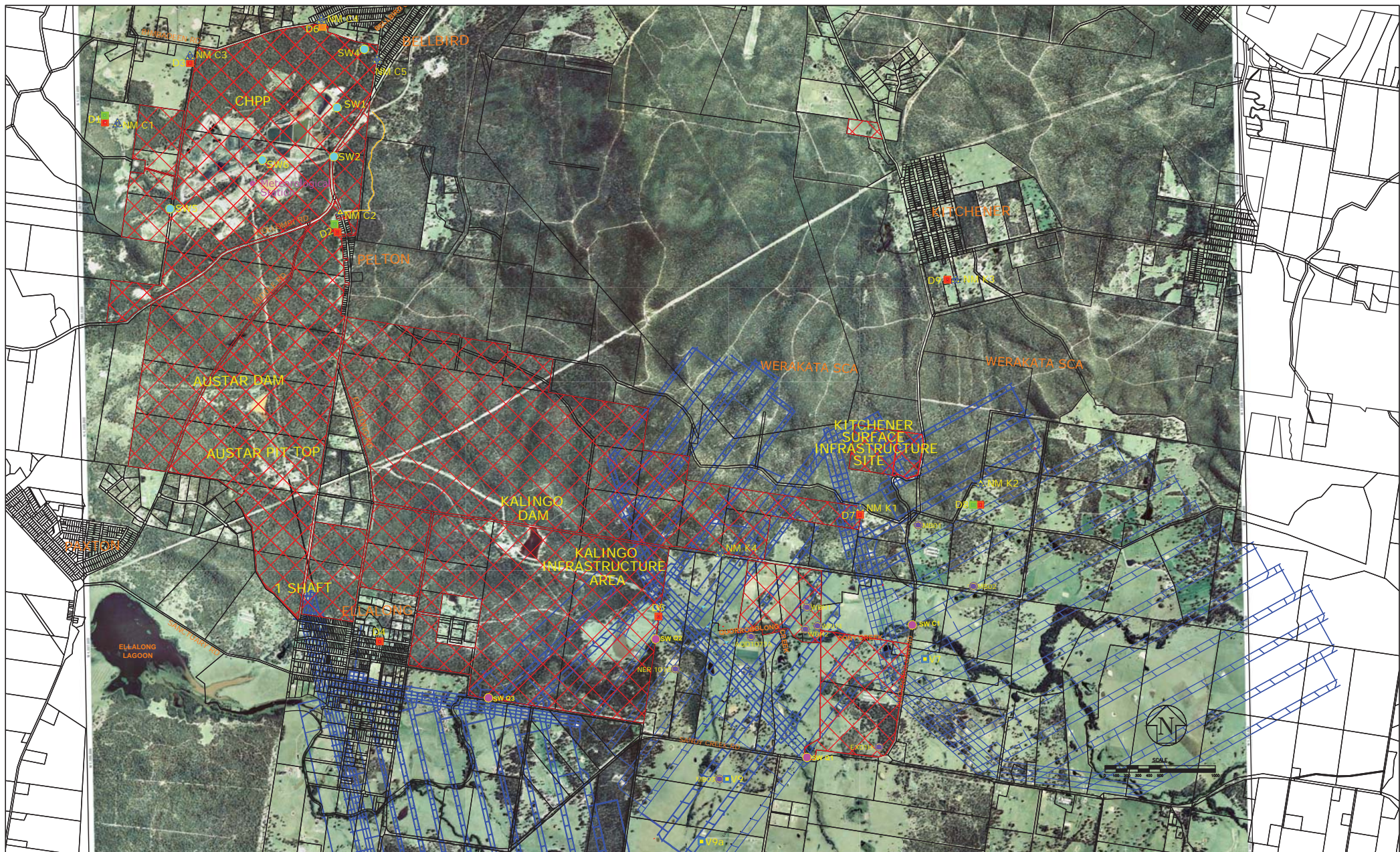
Data Source: Auster Coal Mine (2015)

0 1.0 2.0 2.5km  
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**Legend**

- B1-B3 Extraction Plan Longwall Panels (DA29/95 MOD 6)
- Proposed B4-B7 Longwall Panels (DA25/95 MOD 7)
- 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
- Auster Coal Mine Land
- Cessnock City Council
- Crown Land
- Energy Australia
- Hunter Water
- Minister for Education
- Private Land
- Assumed Freehold Land

File Name (A3): 3504\_114.dgn



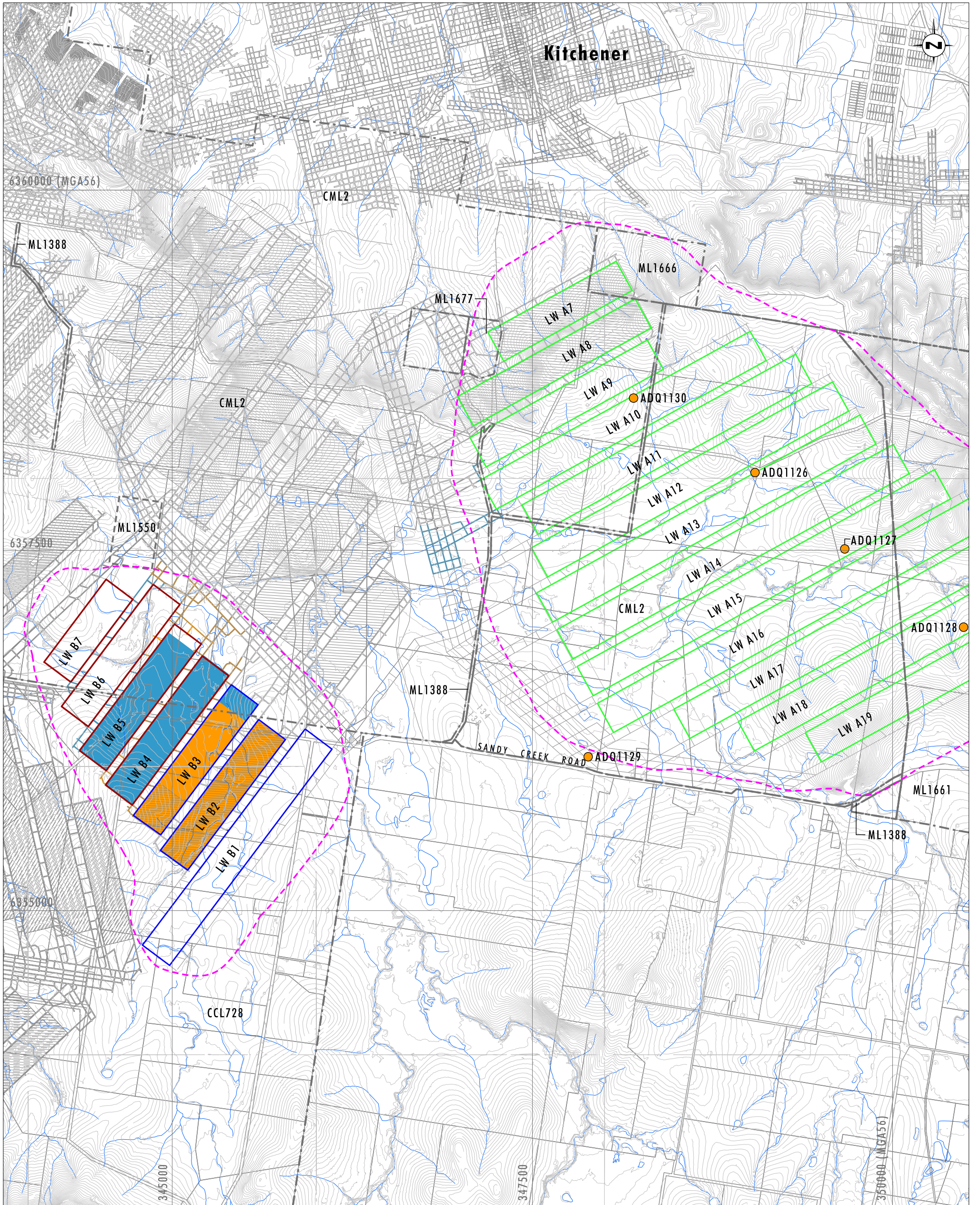
NM 1010	Ground Water Monitor	D5	High Volume Air Sampler / Dust Gauge
NM K1	Noises Monitors	D6	Continuous Dust Monitor
V7	Vibration Monitors	SW 2	Surface Water EPL Sample Points
AUSTAR OWNED LAND	SW C1	SW C2	Coney Creek Sample Points
	SW C1	SW C2	Quomabalong Creek Sample Points

DRAWN	J. Chadwick
DATE	27/9/2017
CHECKED	G. Mulhearn
APPROVED	

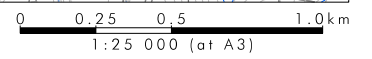
<b>AUSTAR COAL MINE</b>	
<b>Plan 2: Austar Environmental Monitoring Network</b>	
SCALE	Not to scale
DRAWING No.	Environmental/ Monitoring Plan A3







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



### Legend

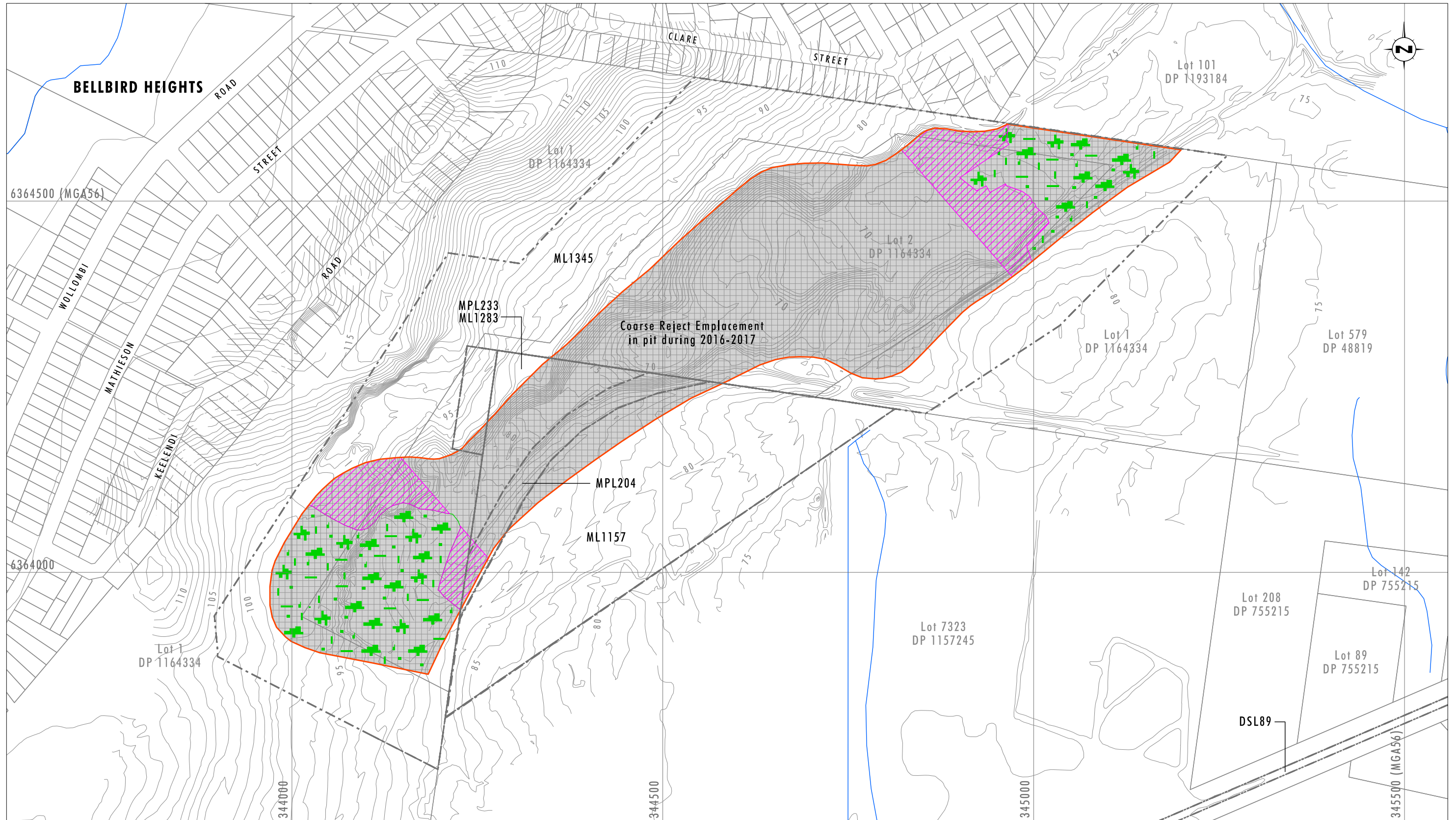
- ▭ B1-B3 Extraction Plan Longwall Panels (DA29/95 MOD6)
- ▭ Proposed B4-B7 Longwall Panels (DA25/95 MOD7)
- ▭ Layout for Stage 3 Longwall Panels (PA08\_0111 MOD3)
- ▭ Previously Mined Land/First Workings
- ▭ Mining Lease Boundary
- ▭ 20mm Subsidence Contour Estimate

- Drainage Line
- Contour Line
- Cadastre

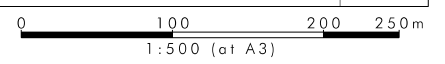
#### Mining Activities

- ▭ July 2016 - June 2017
- ▭ July 2017 - June 2018
- Borehole

File Name (A3): 3504\_115.dgn



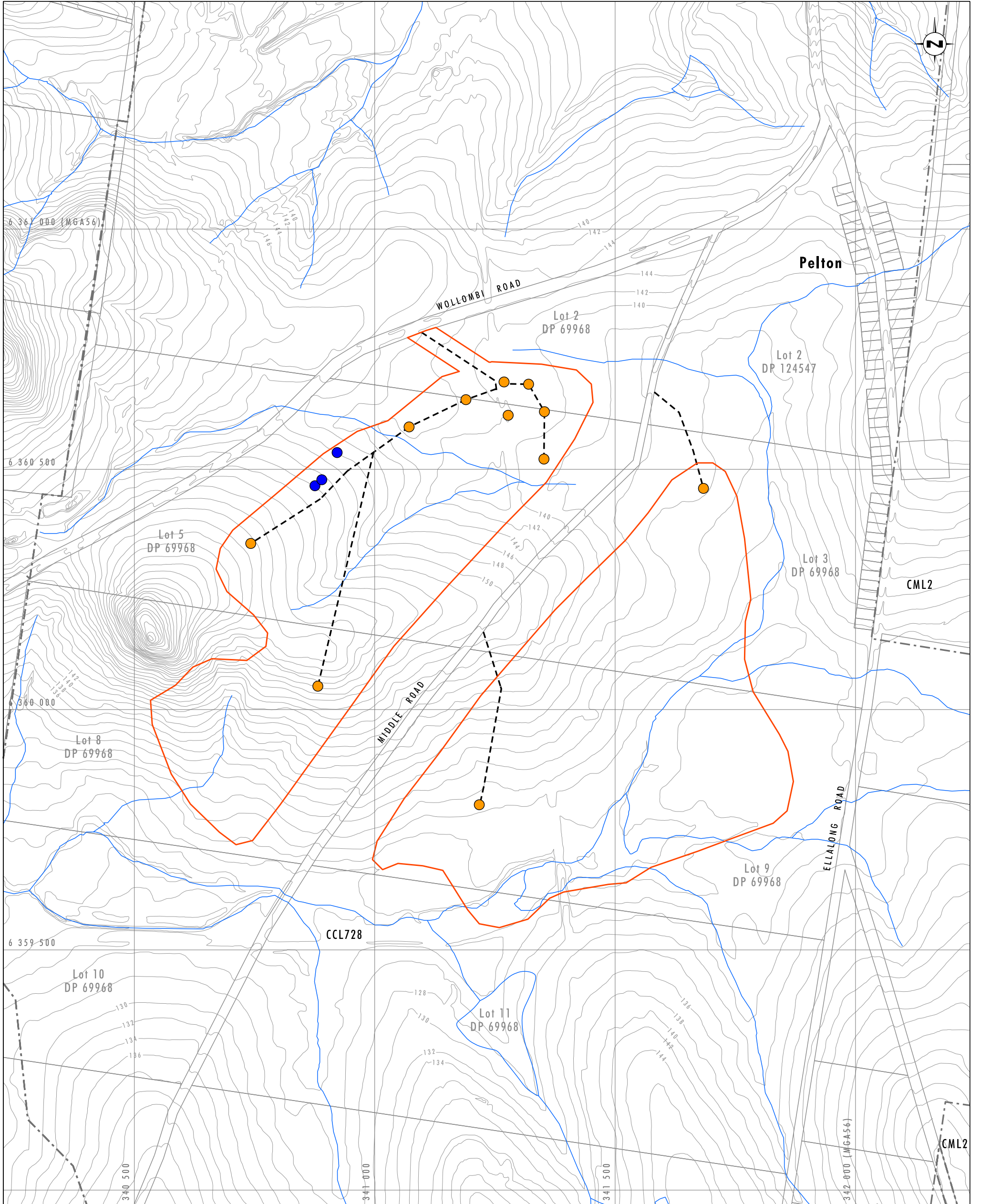
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 Note: 1m and 10m Contour Interval



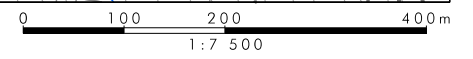
- Legend**
- Stage Plan 2017-2018
  - Mining Lease Boundary
  - Drainage Line
  - Contour Line
  - Cadastral Line
  - Primary Domain
  - 2 - Reject Emplacement Area
  - Secondary Domains
  - Rehabilitation Area - Grassland

PLAN 3B

**Aberdare Extended Emplacement Area  
 Mining and Rehabilitation  
 30 June 2017**



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



- Legend**
- Approved Coarse Reject Emplacement Area (DA74/75/79)
  - Mining Lease Boundary
  - Drilled Borehole 2016-2017
  - Drilled and Grouted Borehole 2016-2017
  - Access Track
  - Drainage Line
  - Contour Line

**PLAN 3D**  
**Tailings Boreholes Area**  
**Mining and Rehabilitation**

# Appendix A: Dust Monitoring Data

### Austar Coal Mine 2016-2017 Dust Deposition Gauge Results (g/m<sup>2</sup>/month)

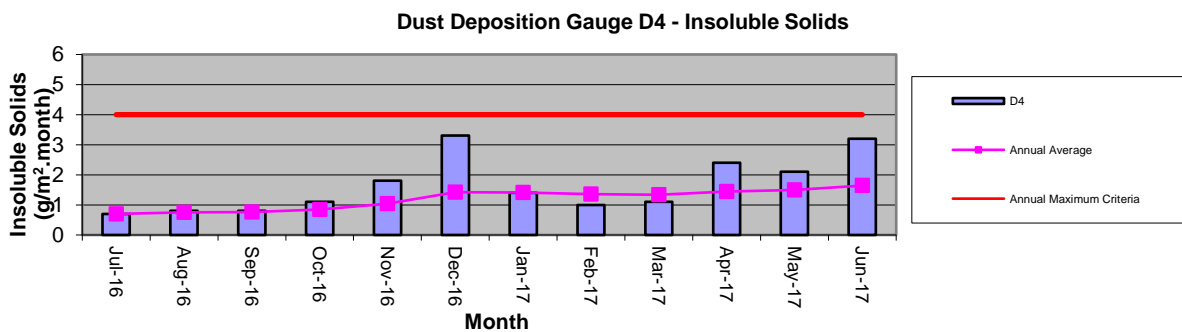
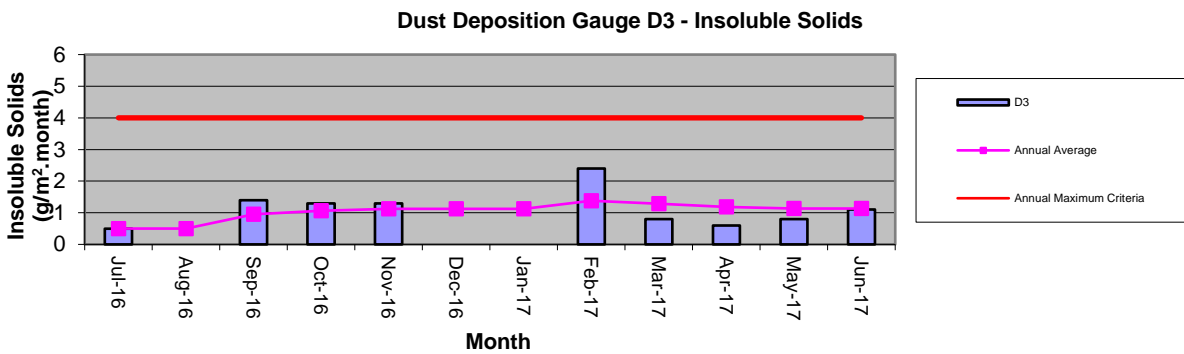
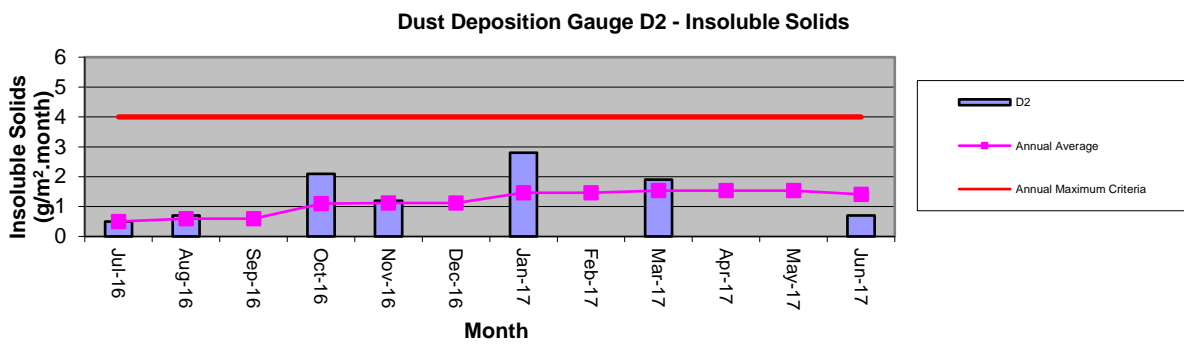
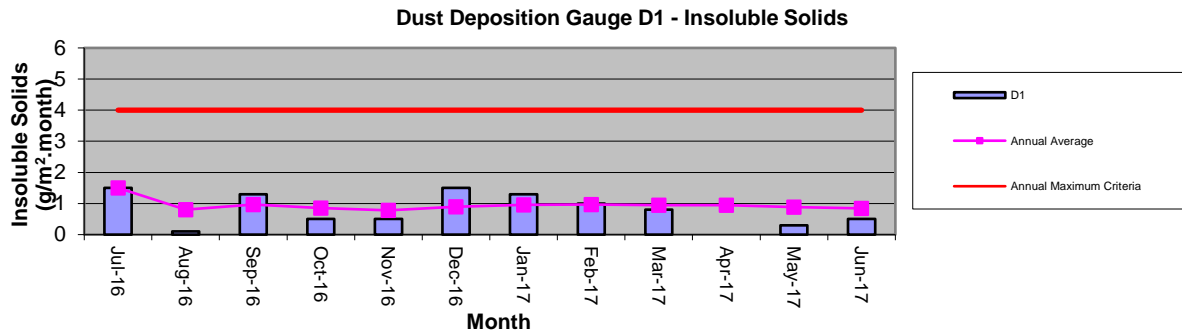
Month	D1			D2			D3			D4			D5			D7			D8			D9			Annual Maximum Criteria
	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	Insoluble Matter	Annual Average YTD	Ash	
Jul-16	1.5	1.5	0.8	0.5	0.5	0.2	0.5	0.5	0.3	0.7	0.7	0.5	2	2.0	1.3	0.3	0.3	0.1	0.6	0.6	0.2	0.6	0.6	0.4	1.5
Aug-16	0.1	0.8	<0.1	0.7	0.6	0.3	37.8c	0.5	26.6	0.8	0.8	0.6	1.1	1.6	0.8	0.3	0.3	0.2	0.8	0.7	0.5	0.6	0.6	0.4	0.8
Sep-16	1.3	1.0	0.9	5.2c	0.6	1.7	1.4	1.0	0.8	0.8	0.8	0.4	2.7	1.9	1.3	2.3	1.0	1.7	0.6	0.7	0.3	0.4	0.5	0.2	1.0
Oct-16	0.5	0.9	0.3	2.1	1.1	1.1	1.3	1.1	0.6	1.1	0.9	0.6	1.3	1.8	0.9	0.7	0.9	0.5	0.4	0.6	0.2	0.6	0.6	0.4	0.9
Nov-16	0.5	0.8	0.1	1.2	1.1	0.3	1.3	1.1	0.4	1.8	1.0	0.7	1	1.6	0.5	0.8	0.9	0.3	0.85	0.7	0.2	0.8	0.6	0.3	0.8
Dec-16	1.5	0.9	0.6	4.7c	1.1	2.3	4.4c	1.1	1.6	3.3	1.4	1.5	2.8c	1.6	0.6	0.7	0.9	0.4	1.3	0.8	0.9	1.4	0.7	0.9	0.9
Jan-17	1.3	1.0	0.6	2.8	1.5	1.5	3.9c	1.1	0.5	1.4	1.4	0.6	0.8	1.5	0.2	1.8	1.0	0.6	1.2	0.8	0.5	1.1	0.8	0.5	1.0
Feb-17	1	1.0	0.5	3.8c	1.5	2.4	2.4	1.4	1.1	1	1.4	0.6	2.7	1.7	1.4	1.6	1.1	0.9	1.0	0.8	0.6	1	0.8	0.5	1.0
Mar-17	0.8	0.9	0.5	1.9	1.5	0.7	0.8	1.3	0.4	1.1	1.3	0.6	0.5	1.5	0.3	0.6	1.0	0.2	0.6	0.8	0.4	0.7	0.8	0.4	0.9
Apr-17	4.4c	0.9	1.3	3.9c	1.5	1.3	0.6	1.2	0.2	2.4	1.4	1.6	4.4c	1.5	2.9	0.9	1.0	0.3	1.0	0.8	0.2	0.7	0.8	0.1	0.9
May-17	0.3	0.9	0.3	6.1c	1.5	2.0	0.8	1.1	0.5	2.1	1.5	1.8	8.2c	1.5	3.3	0.4	0.9	0.3	2.4	1.0	1.0	0.8	0.8	0.6	0.9
Jun-17	0.5	0.8	0.2	0.7	1.4	0.3	1.1	1.1	0.5	3.2	1.6	2.6	3.1c	1.5	1.1	0.7	0.9	0.4	0.3	0.9	0.2	0.4	0.8	0.2	0.8

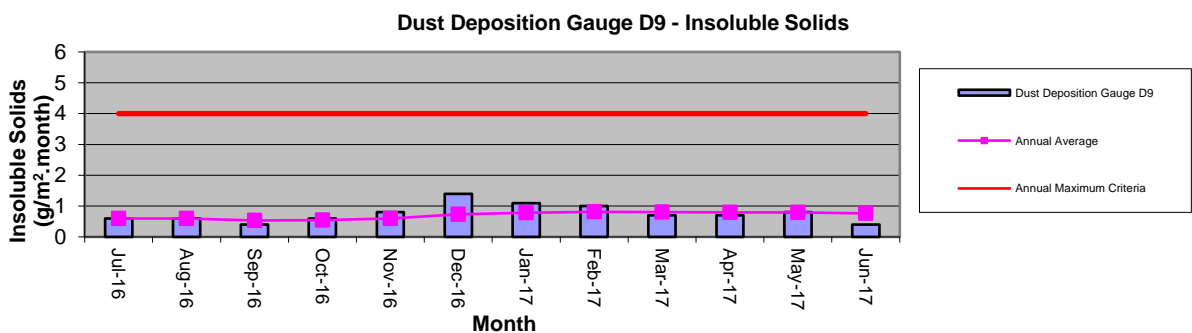
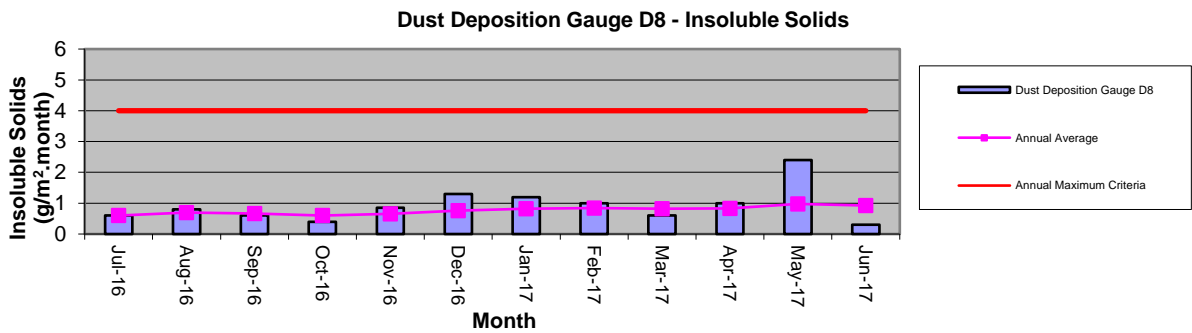
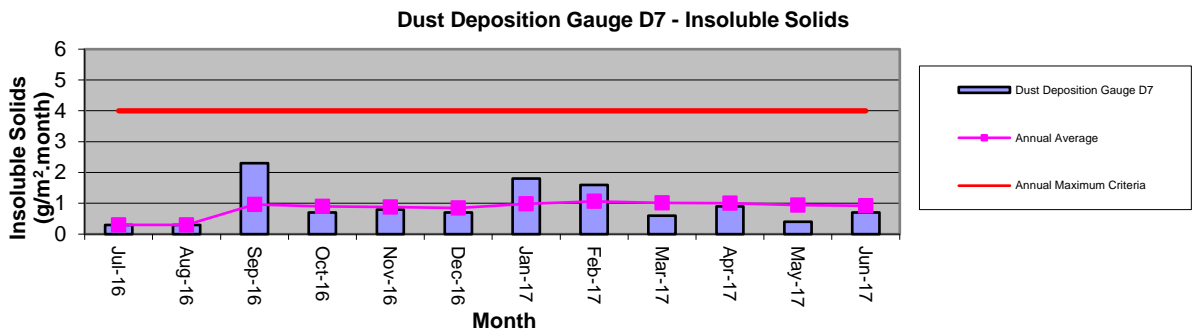
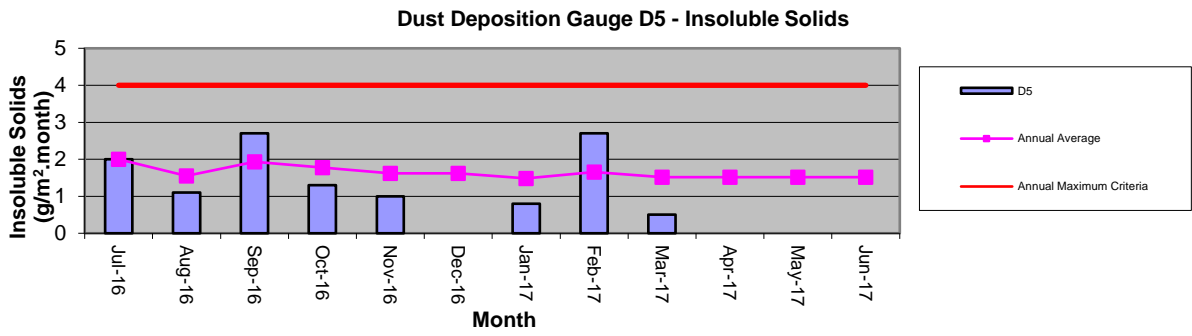
**Note:** "c" denotes contaminated with bird droppings or similar. NS denotes sampling not undertaken. NA denotes sample not available as bottle was missing. Not used for Annual Average Calculations.

Individual monthly dust results and Annual Average dust results over the Annual Average Criteria of 4g/m<sup>2</sup> are highlighted in bold.

YTD denotes Year to Date.

### Austar Coal Mine 2016-2017 Dust Deposition Gauge Result Graphs





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

**Austar Coal Mine 2016-2017 High Volume Air Sampler (HVAS) Results (PM<sub>10</sub> µg/m<sup>3</sup>)**

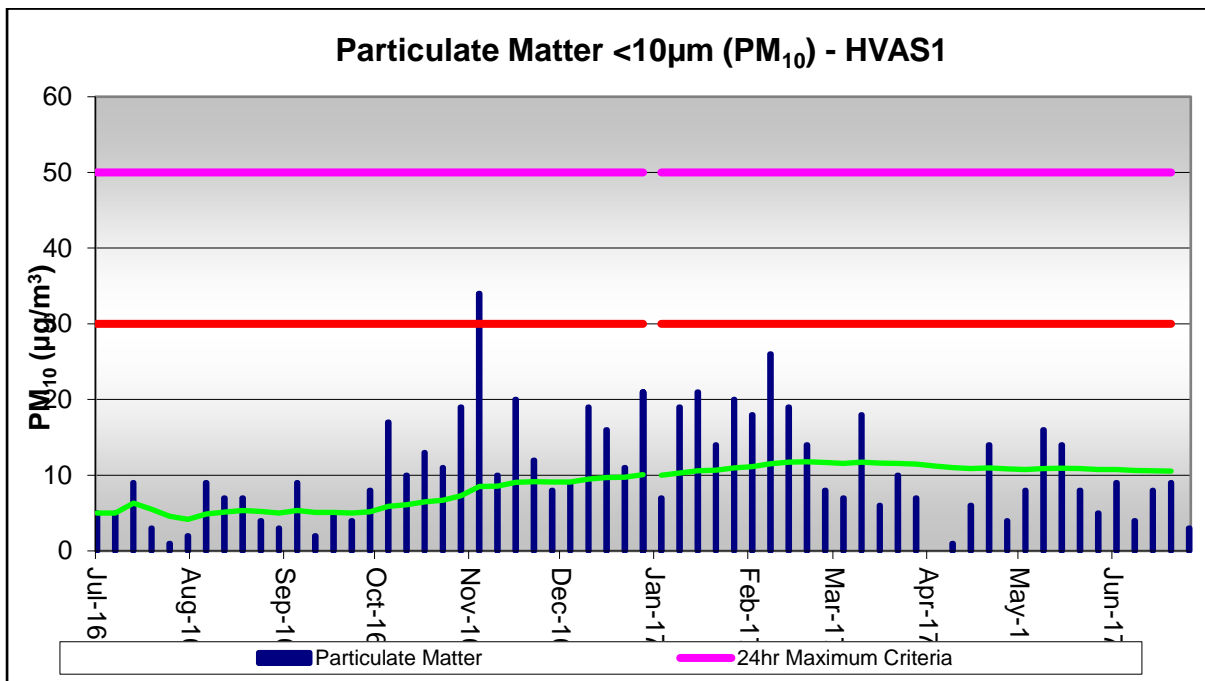
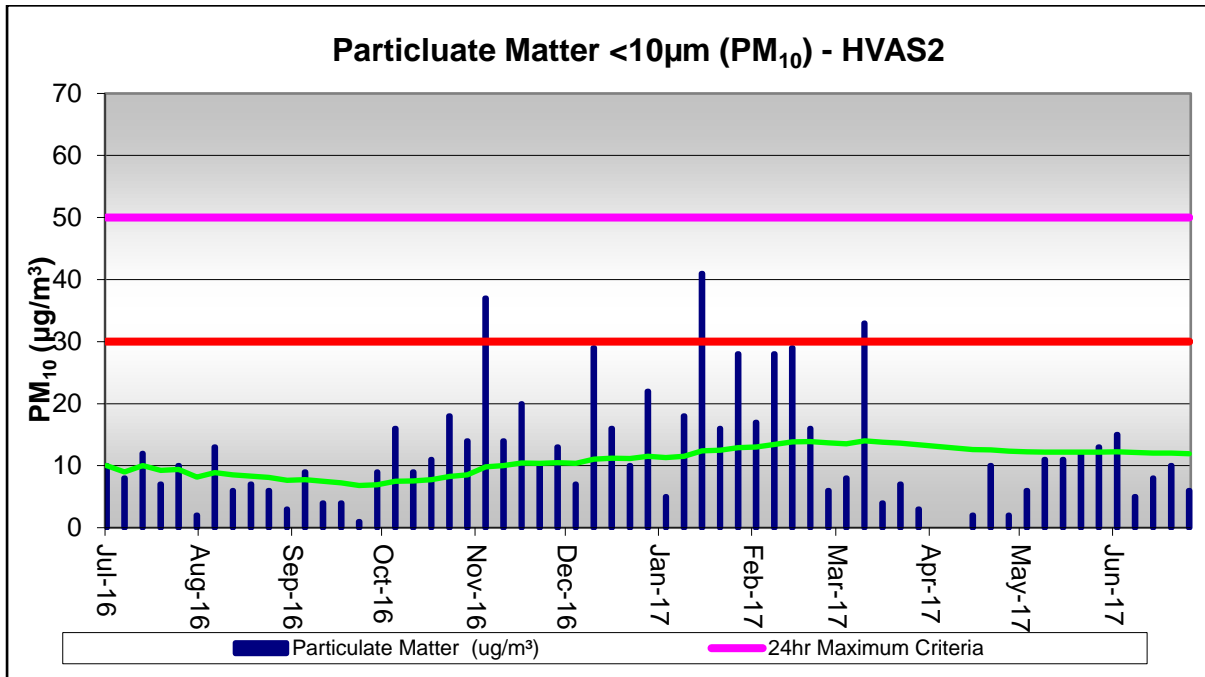
Date	Particulate Matter <10µm (PM <sub>10</sub> ) – HVAS1			Particulate Matter <10µm (PM <sub>10</sub> ) – HVAS2			Particulate Matter <10µm (PM <sub>10</sub> ) – HVAS3		
	Particulate Matter	Monthly Average	Current Annual Average YTD	Particulate Matter	Monthly Average	Current Annual Average YTD	Particulate Matter	Monthly Average	Current Annual Average YTD
4/07/2016	5		5.0	10		10.0	10		10.0
10/07/2016	5		5.0	8		9.0	3		6.5
16/07/2016	9		6.3	12		10.0	11		8.0
22/07/2016	3		5.5	7		9.3	2		6.5
28/07/2016	1	4.6	4.6	10	9.4	9.4	3	5.8	5.8
3/08/2016	2		4.2	2		8.2	6		5.8
9/08/2016	9		4.9	13		8.9	7		6.0
15/08/2016	7		5.1	6		8.5	8		6.3
21/08/2016	7		5.3	7		8.3	6		6.2
27/08/2016	4	5.8	5.2	6	6.8	8.1	4	6.2	6.0
2/09/2016	3		5.0	3		7.6	3		5.7
8/09/2016	9		5.3	9		7.8	10		6.1
14/09/2016	2		5.1	4		7.5	4		5.9
20/09/2016	5		5.1	4		7.2	6		5.9
26/09/2016	4	4.6	5.0	1	4.2	6.8	3	5.2	5.7
2/10/2016	8		5.2	9		6.9	6		5.8
8/10/2016	17		5.9	16		7.5	15		6.3
14/10/2016	10		6.1	9		7.6	6		6.3
20/10/2016	13		6.5	11		7.7	10		6.5
26/10/2016	11	11.8	6.7	18	12.6	8.3	12	9.8	6.8
1/11/2016	19		7.3	14		8.5	9		6.9
7/11/2016	34		8.5	37		9.8	26		7.7
13/11/2016	10		8.6	14		10.0	11		7.9
19/11/2016	20		9.0	20		10.4	18		8.3
25/11/2016	12	19.0	9.2	10	19.0	10.4	10	14.8	8.4
1/12/2016	8		9.1	13		10.5	11		8.5
7/12/2016	9		9.1	7		10.4	10		8.5
13/12/2016	19		9.5	29		11.0	31		9.3
19/12/2016	16		9.7	16		11.2	12		9.4
25/12/2016	11		9.7	10		11.2	10		9.4
31/12/2016	21	14.0	10.1	22	16.2	11.5	24	16.3	9.9
6/01/2017	7		10.0	5		11.3	4		9.7
12/01/2017	19		10.3	18		11.5	18		10.0
18/01/2017	21		10.6	41		12.4	18		10.2
24/01/2017	14		10.7	16		12.5	15		10.3
30/01/2017	20	16.2	10.9	28	21.6	12.9	17	14.4	10.5
5/02/2017	18		11.1	17		13.0	17		10.7
11/02/2017	26		11.5	28		13.4	31		11.2
17/02/2017	19		11.7	29		13.8	18		11.4
23/02/2017	14	19.3	11.8	16	22.5	13.9	15	20.3	11.5
1/03/2017	8		11.7	6		13.7	6		11.4
7/03/2017	7		11.6	8		13.5	7		11.3



Date	Particulate Matter <10µm (PM <sub>10</sub> ) – HVAS1			Particulate Matter <10µm (PM <sub>10</sub> ) – HVAS2			Particulate Matter <10µm (PM <sub>10</sub> ) – 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
13/03/2017	18		11.7	33		14.0	18		11.4
19/03/2017	6		11.6	4		13.8	5		11.3
25/03/2017	10		11.6	7		13.6	9		11.2
31/03/2017	7	9.3	11.5	3	10.2	13.4	6	8.5	11.1
6/04/2017	0		11.2	0		13.1	0		10.9
12/04/2017	1		11.0	0		12.8	0		10.6
18/04/2017	6		10.9	2		12.6	5		10.5
24/04/2017	14		11.0	10		12.6	13		10.6
30/04/2017	4	5.0	10.8	2	2.8	12.4	4	4.4	10.5
6/05/2017	8		10.8	6		12.2	6		10.4
12/05/2017	16		10.9	11		12.2	16		10.5
18/05/2017	14		10.9	11		12.2	8		10.4
24/05/2017	8		10.9	12		12.2	3		10.3
30/05/2017	5	10.2	10.8	13	10.6	12.2	9	8.4	10.3
5/06/2017	9		10.7	15		12.2	8		10.2
11/06/2017	4		10.6	5		12.1	4		10.1
17/06/2017	8		10.6	8		12.1	7		10.1
23/06/2017	9		10.6	10		12.0	6		10.0
29/06/2017	3	6.6	10.4	6	8.8	11.9	5	6.0	9.9

**Note:** The annual average PM<sub>10</sub> criterion is 30 µg/m<sup>3</sup>. Annual average results greater than this figure are bold.  
The 24-hour average PM<sub>10</sub> criterion is 50 µg/m<sup>3</sup>. Results greater than this figure are bold.  
YTD denotes year to date.

**Austar Coal Mine 2016-2017 High Volume Air Sampler (HVAS) Results Graphs**

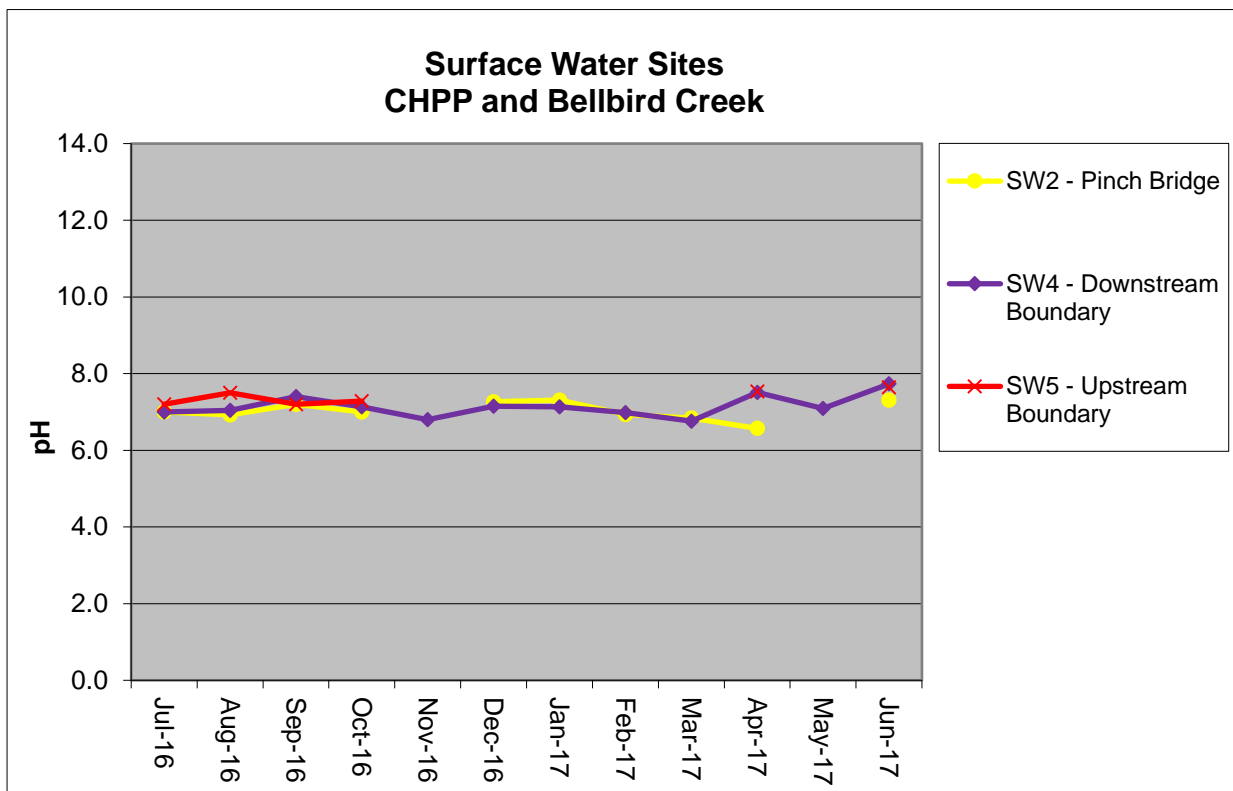
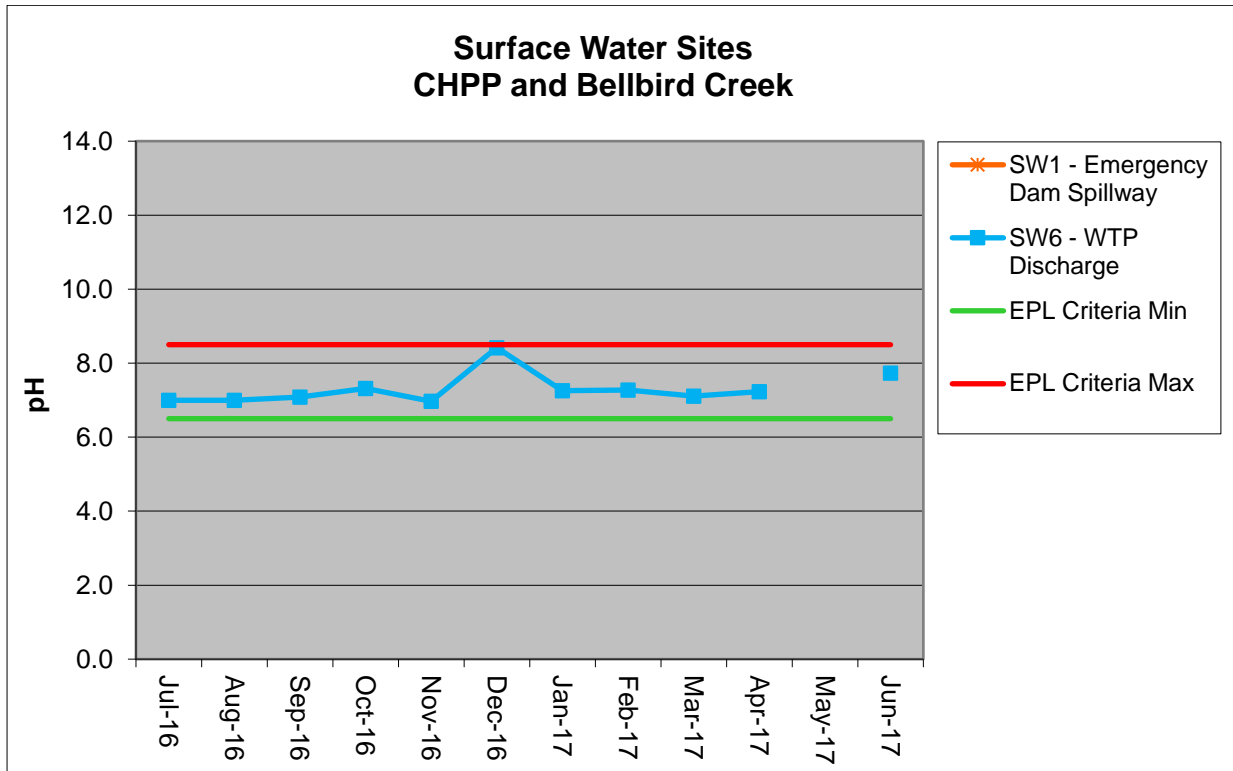




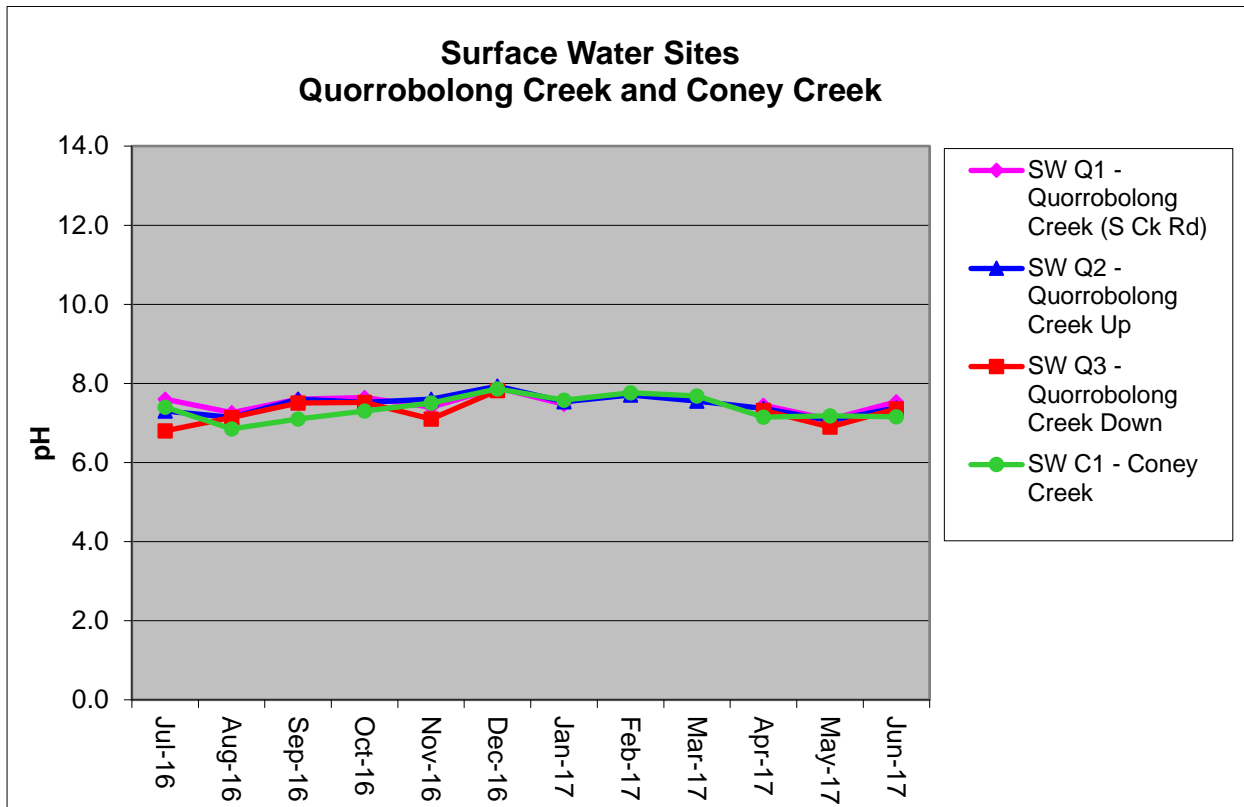
# Appendix B:

# Water Quality Data

**Austar Coal Mine 2016-2017 Surface Water Monitoring Results Graphs – pH**

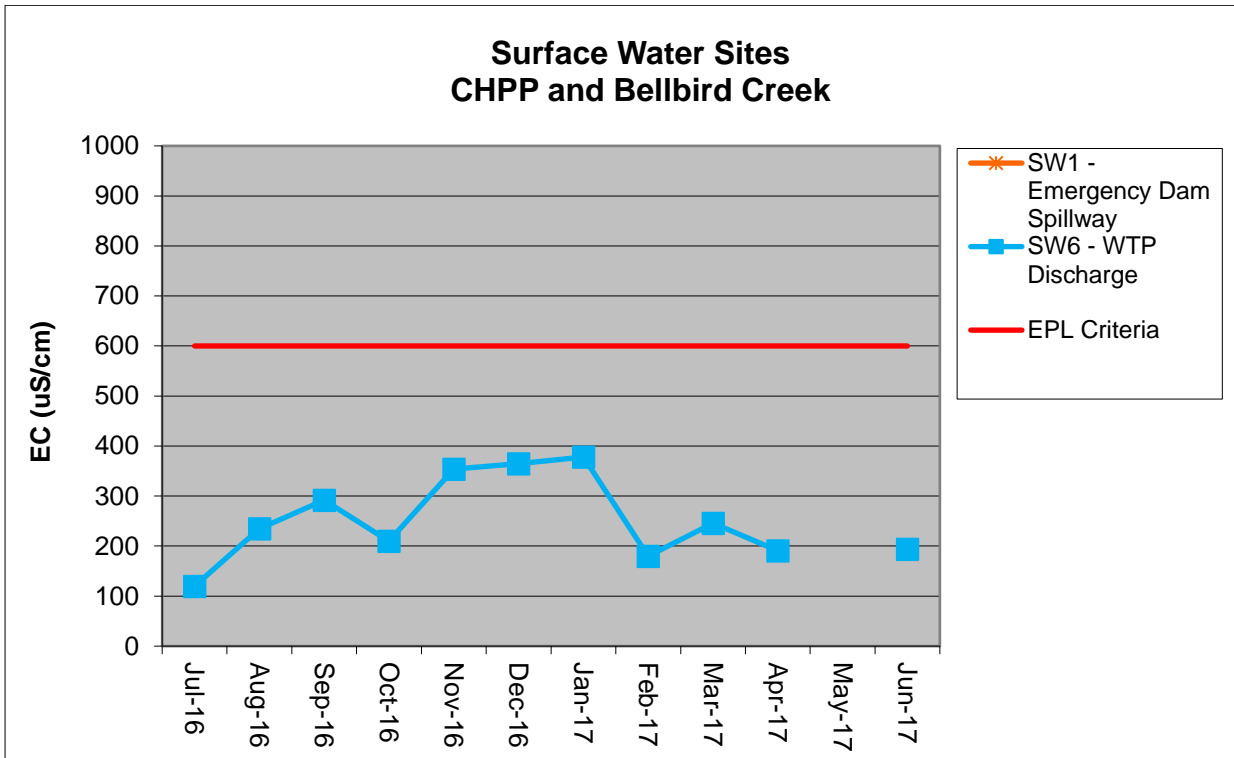


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

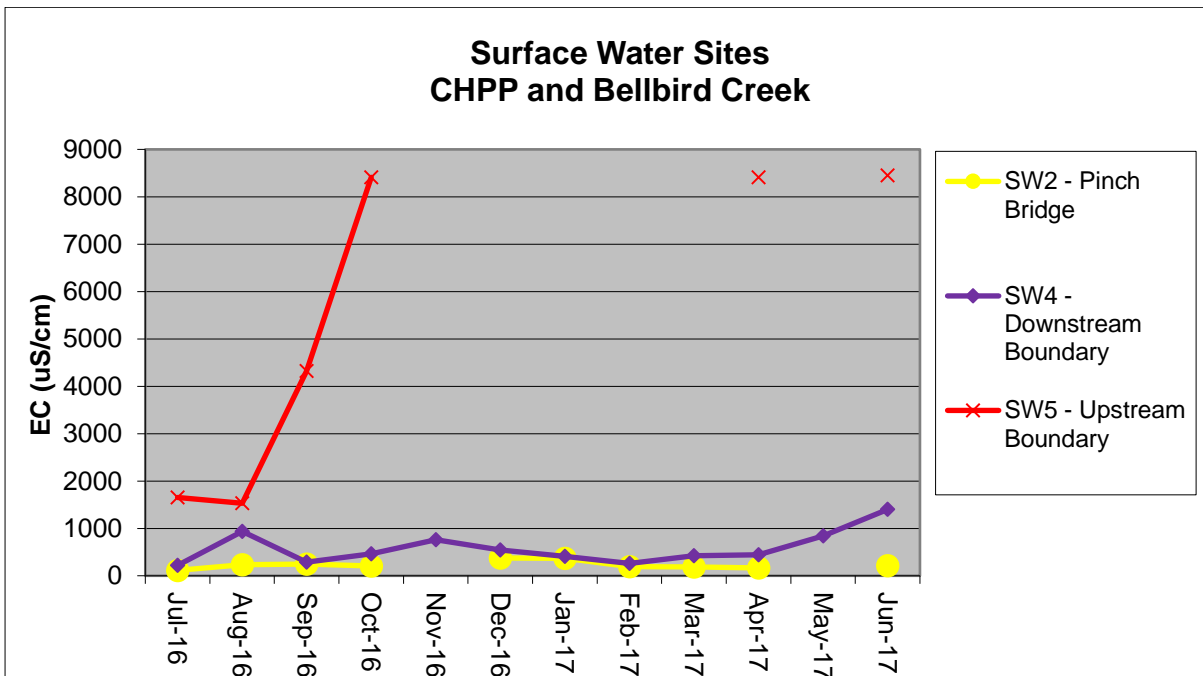


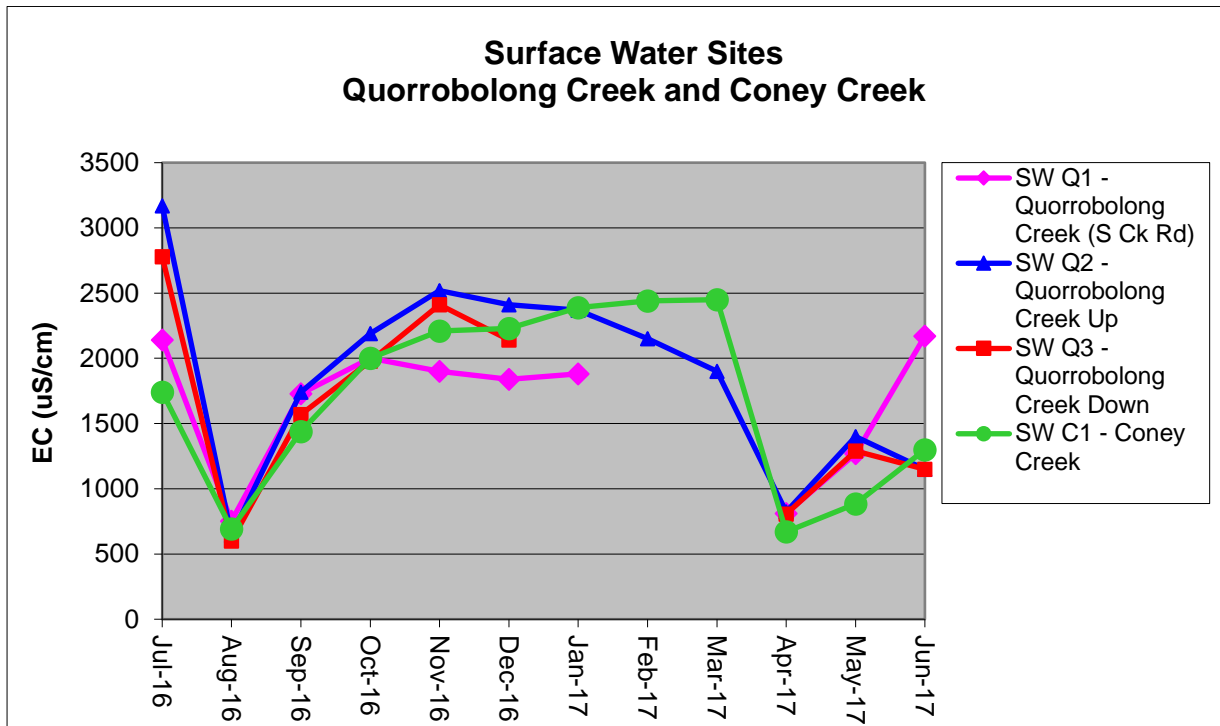
*Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.*

**Austar Coal Mine 2016-2017 Surface Water Monitoring Results Graphs – EC and TDS**



Note: No discharge occurred from SW1 in 2016-2017 reporting period.

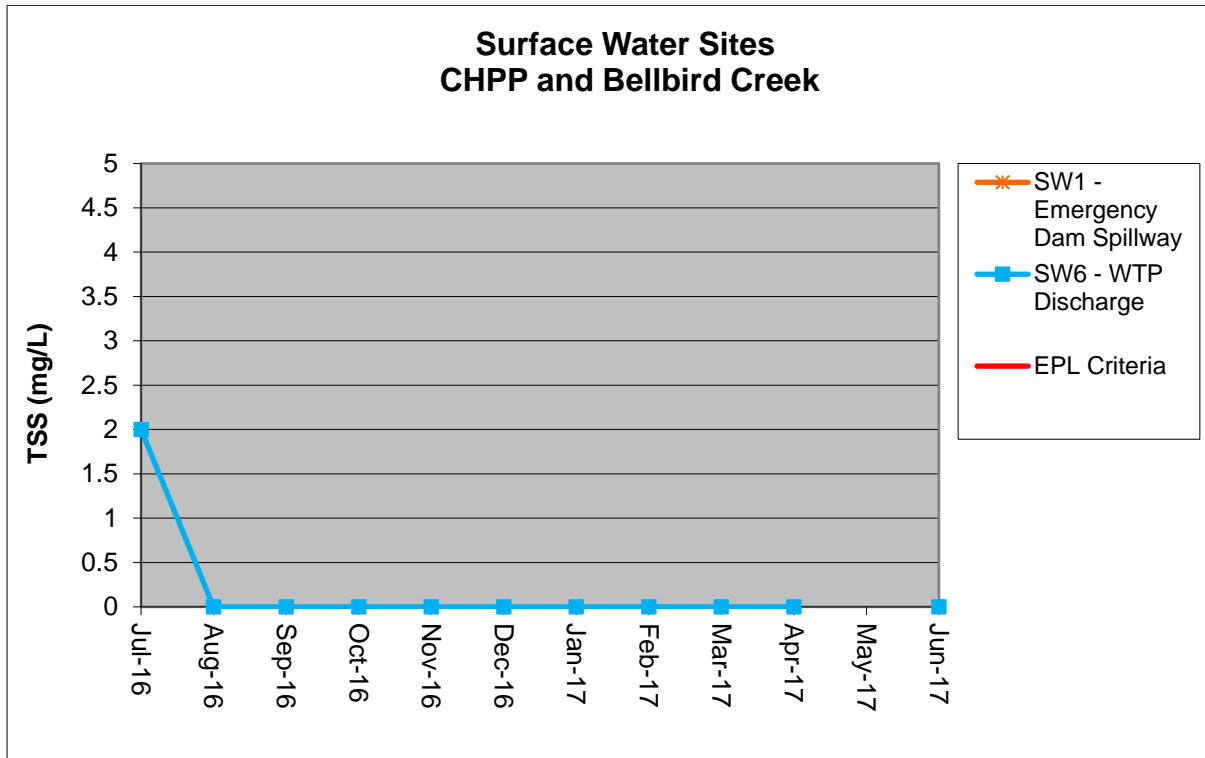




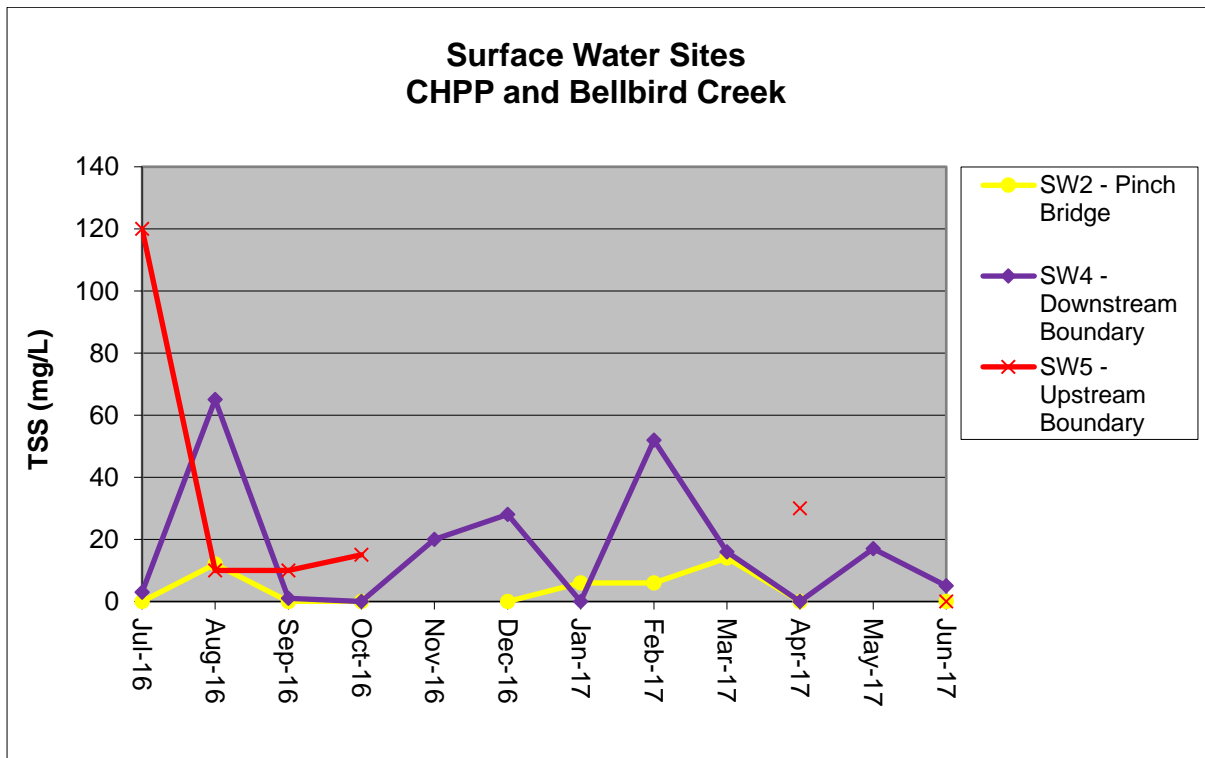
Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.



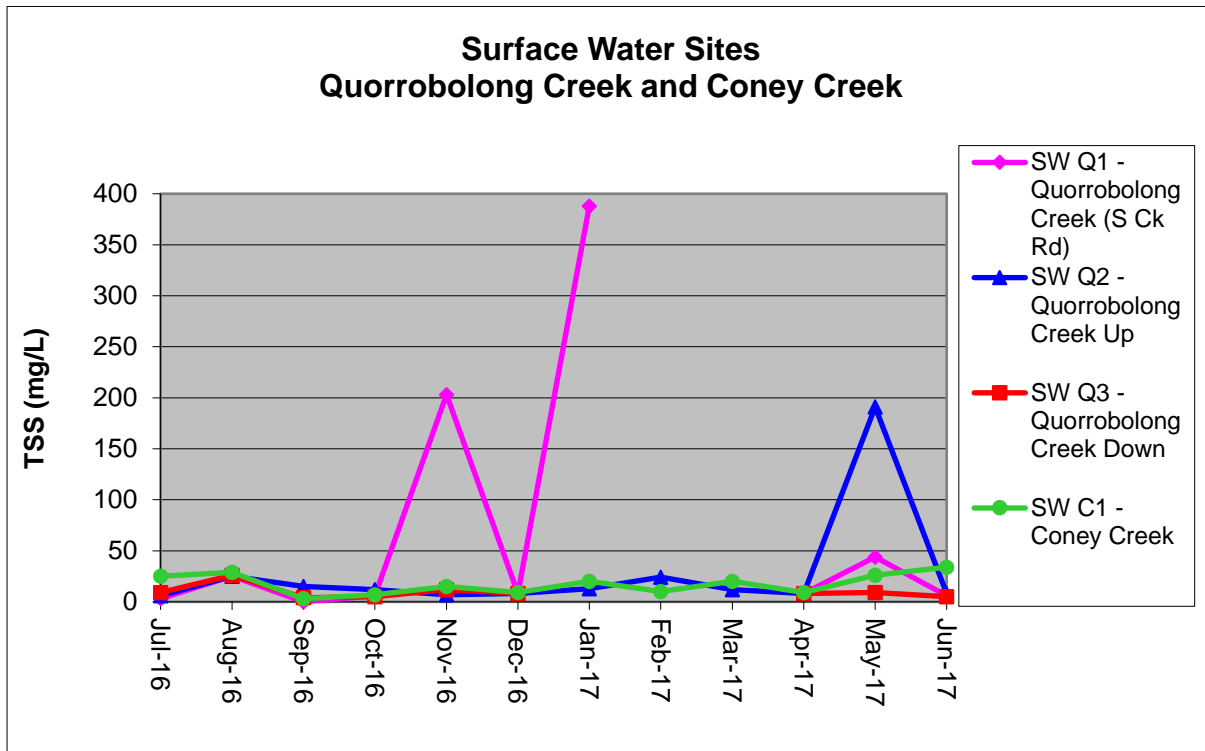
**Austar Coal Mine 2016-2017 Surface Water Monitoring Results Graphs – TSS**



Note: No discharge occurred from SW1 in 2016-2017 reporting period.

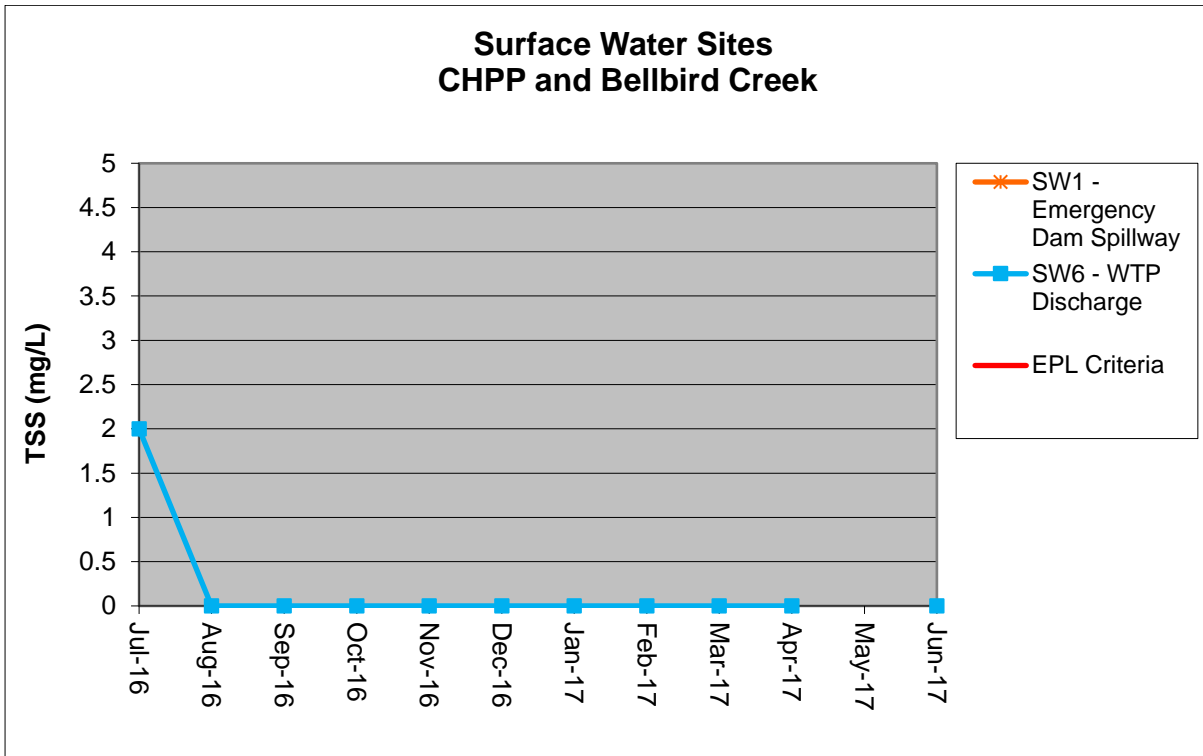


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

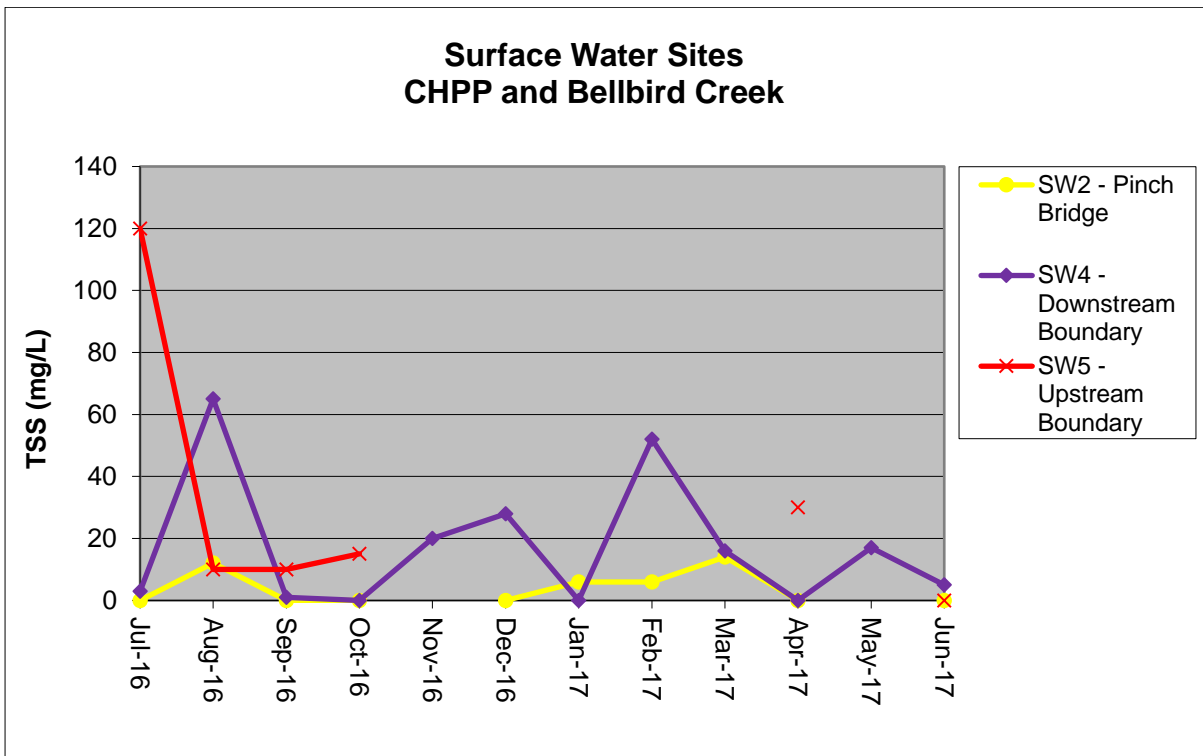


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

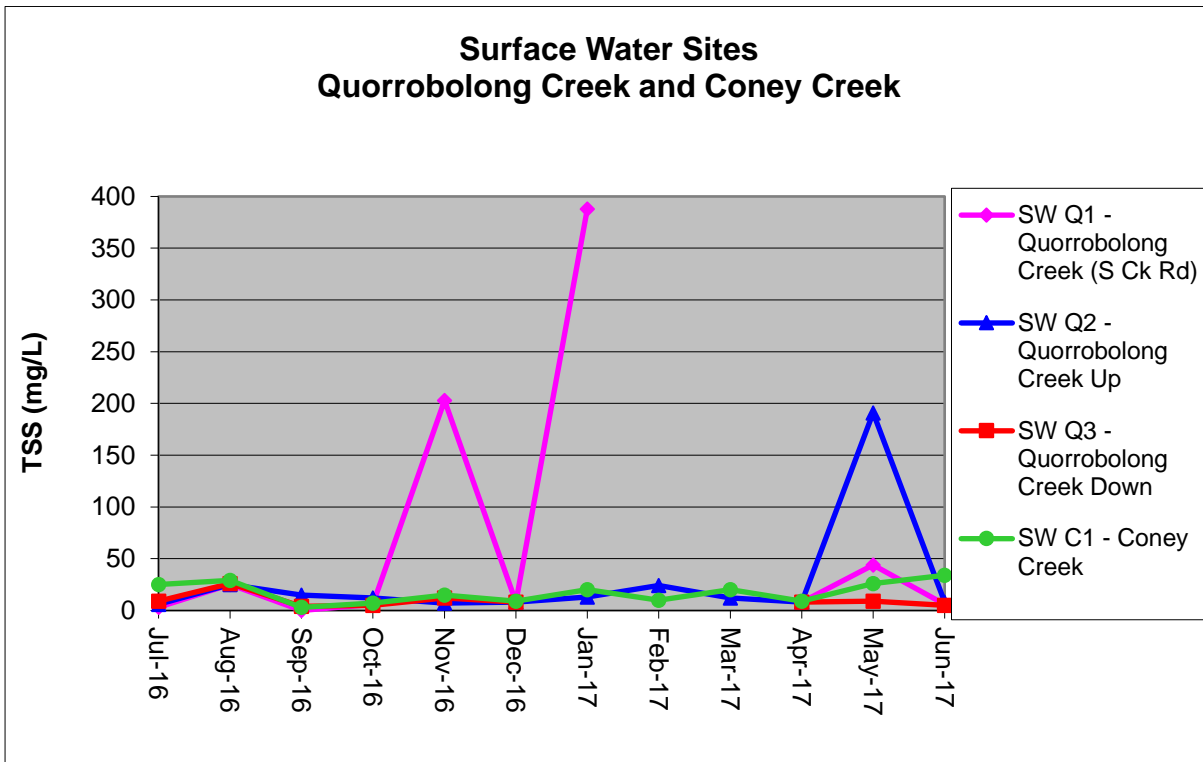
**Austar Coal Mine 2016-2017 Surface Water Monitoring Results Graphs – Fe**



Note: No discharge occurred from SW1 in 2016-2017 reporting period.



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

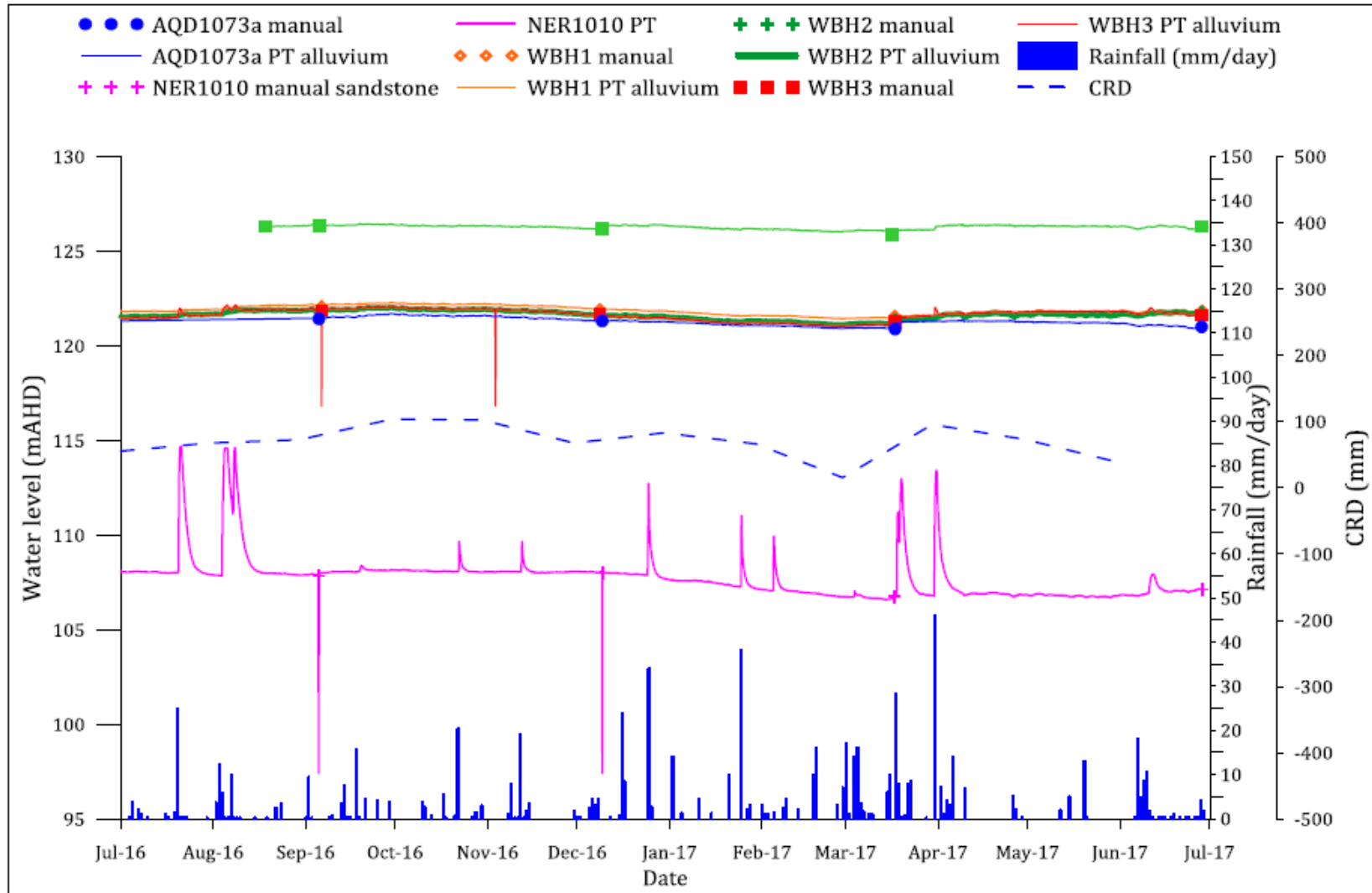


Note: For months where results are not shown the creeks were dry and a sample was not able to be collected.

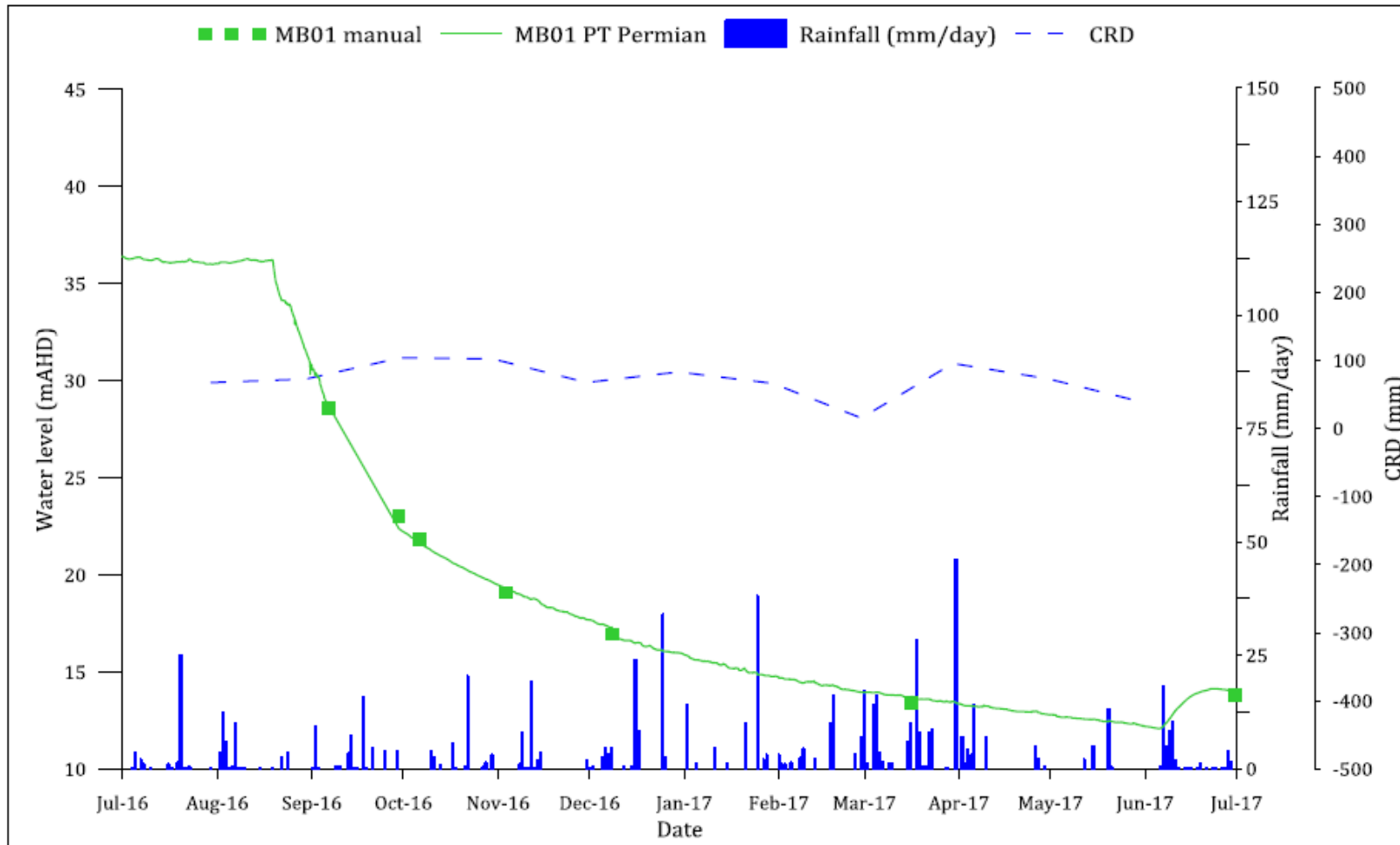
# **Appendix C:**

# **Groundwater Level and Quality Monitoring Data**

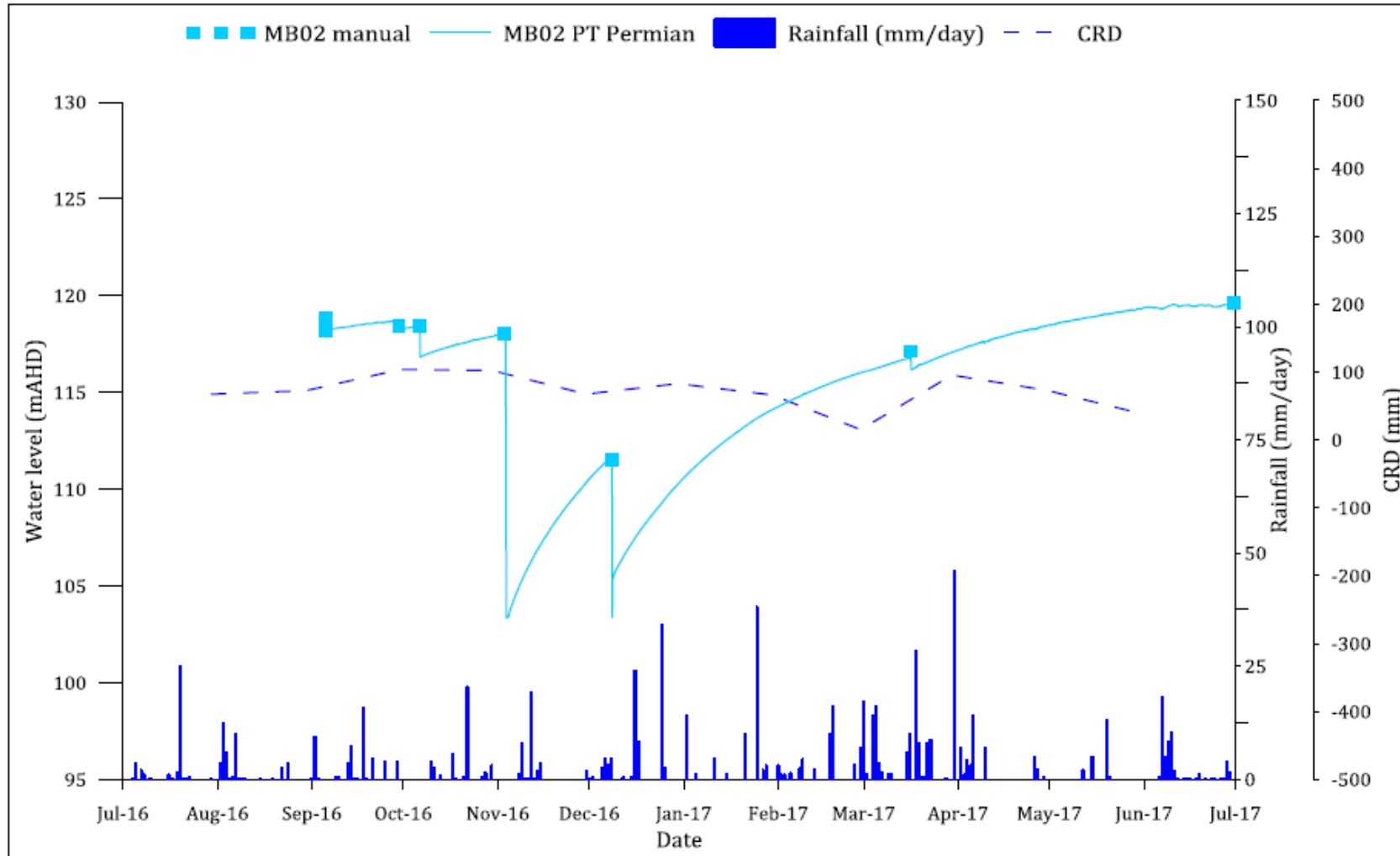
### Groundwater Level Monitoring Data – Groundwater Depth and Daily Rainfall



### Stage 3 MB01 Sandstone Hydrograph

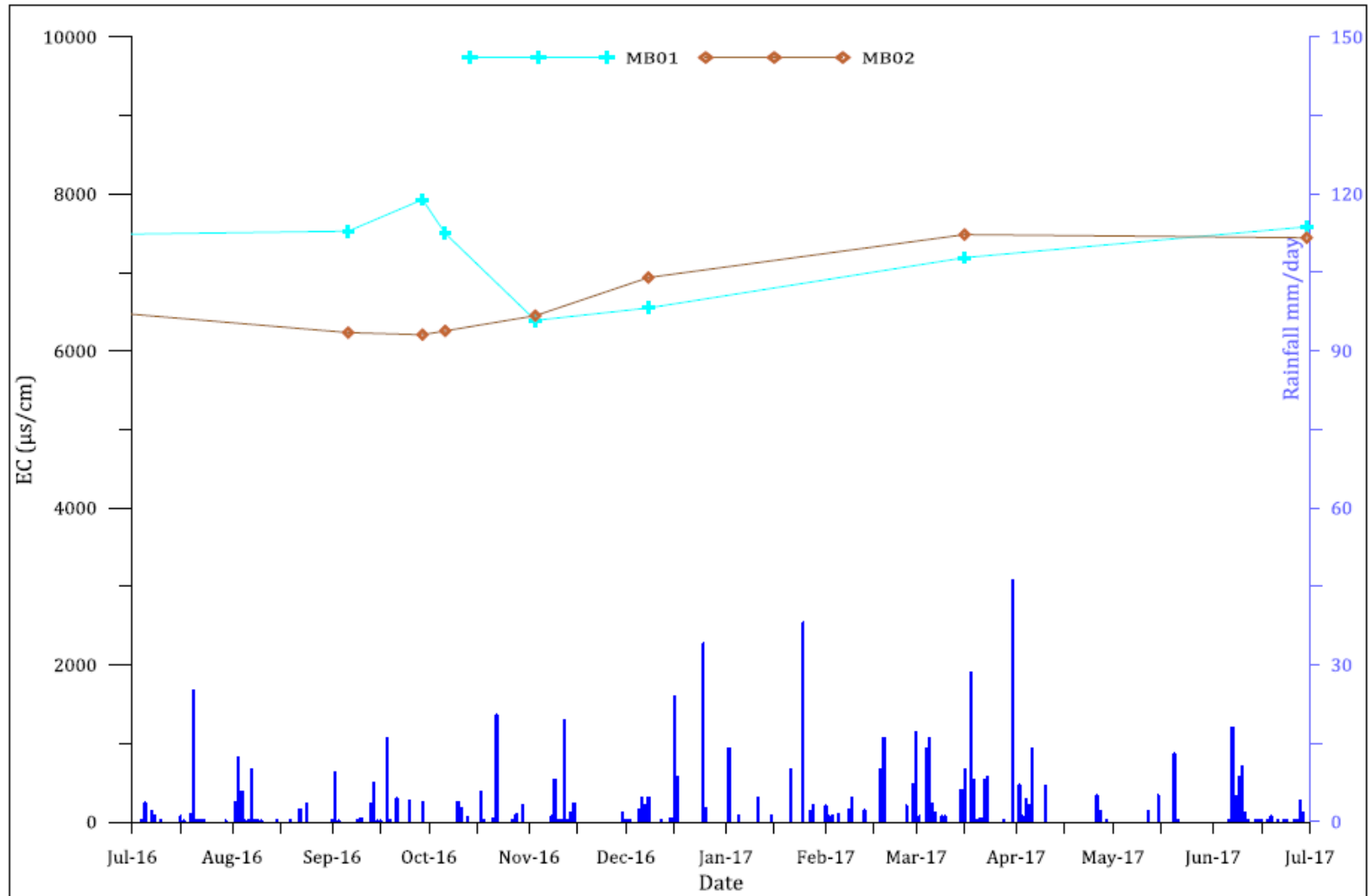


### Stage 3 MB02 Sandstone Hydrograph

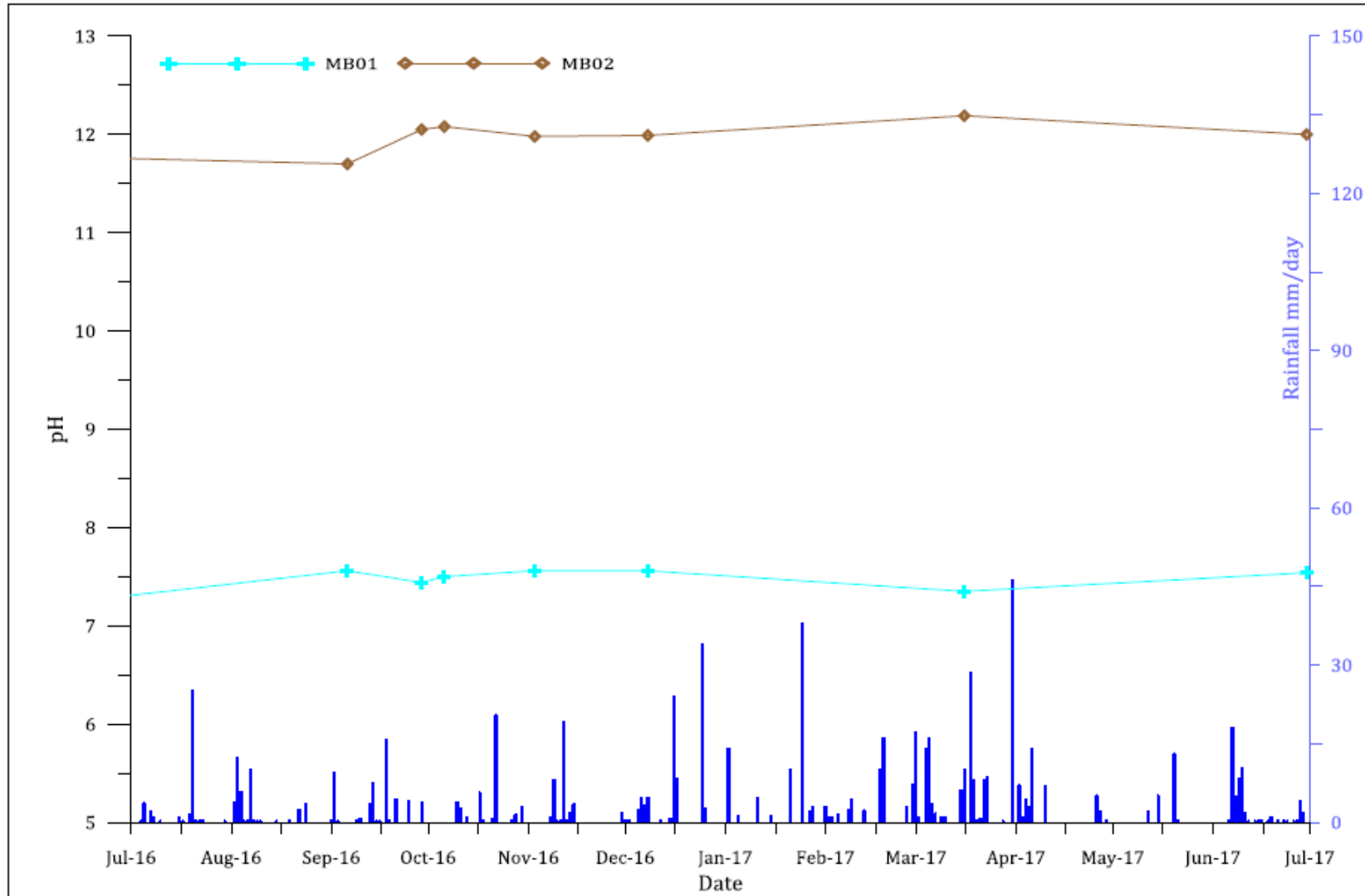




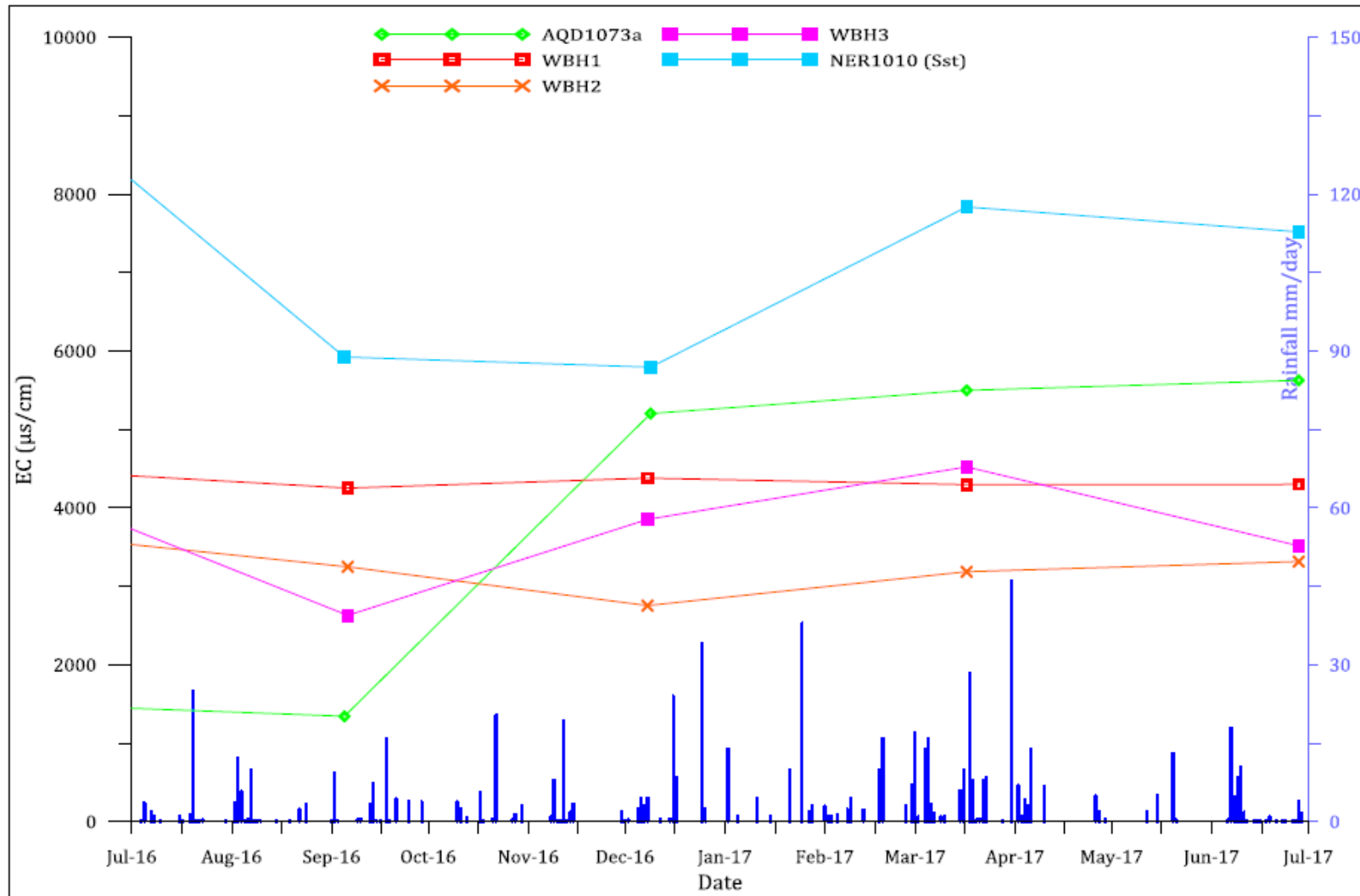
### Stage 3 Sandstone EC



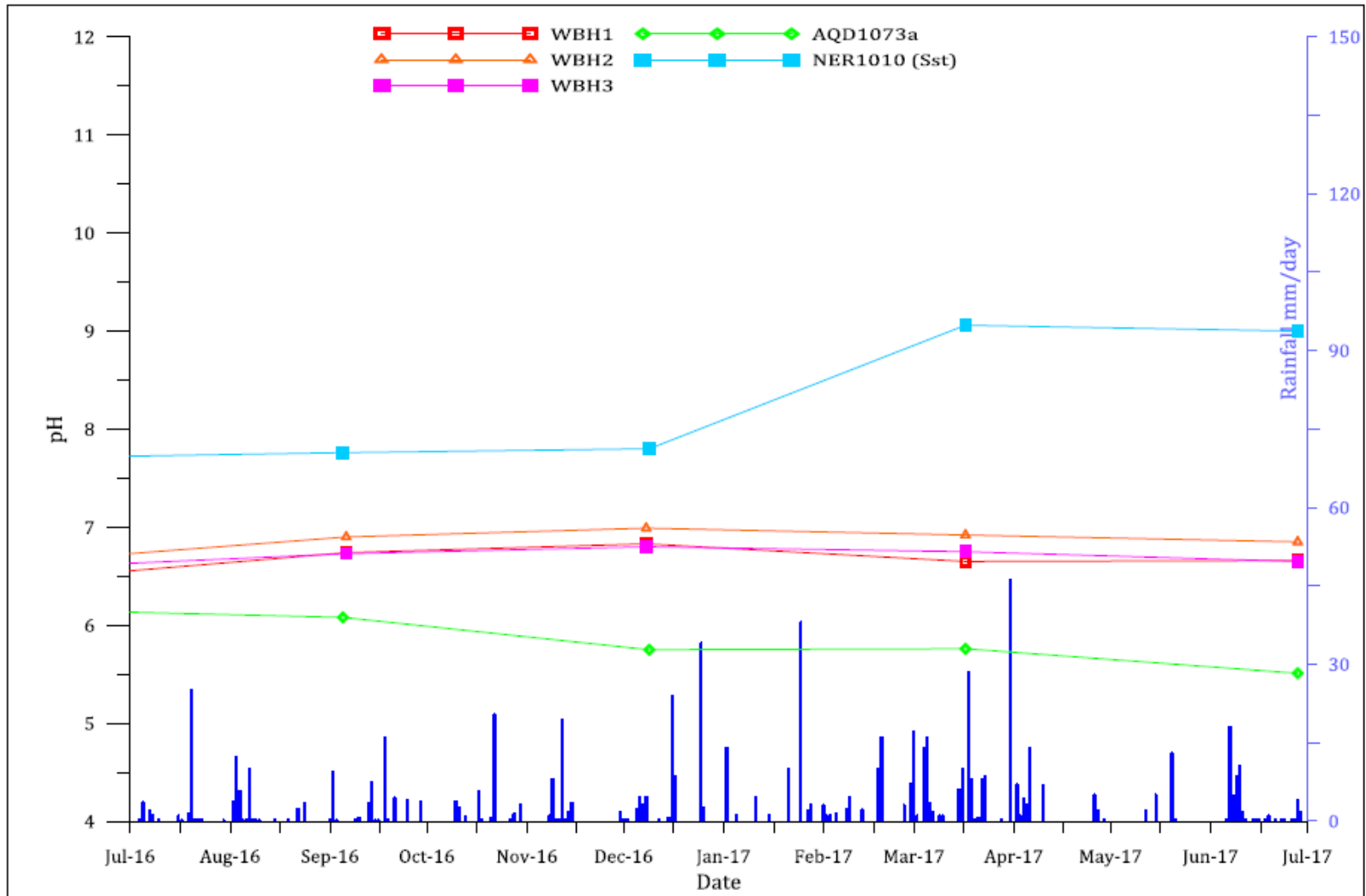
### Stage 3 Sandstone pH



### Stage 2 Alluvial and Sandstone EC

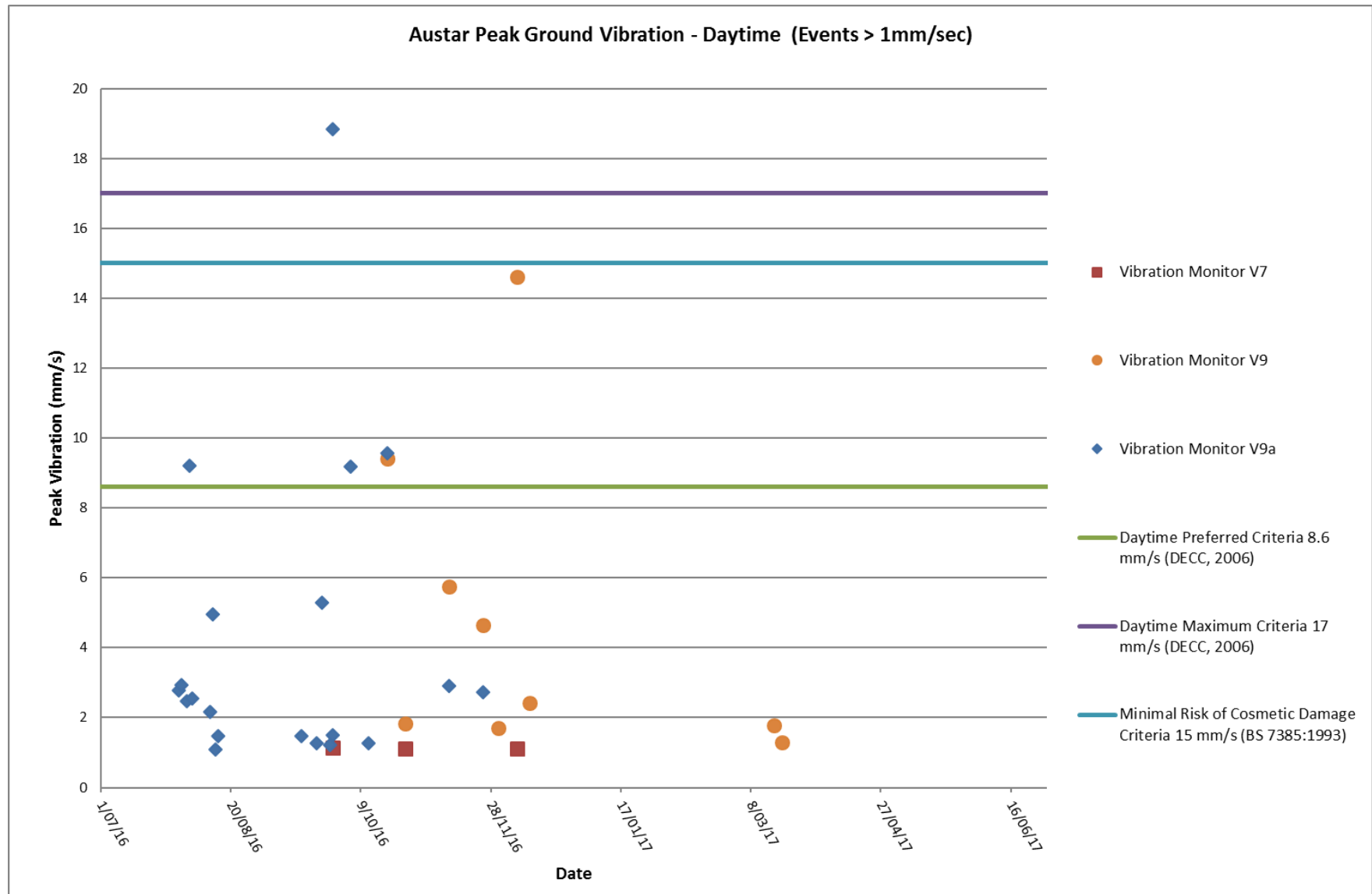


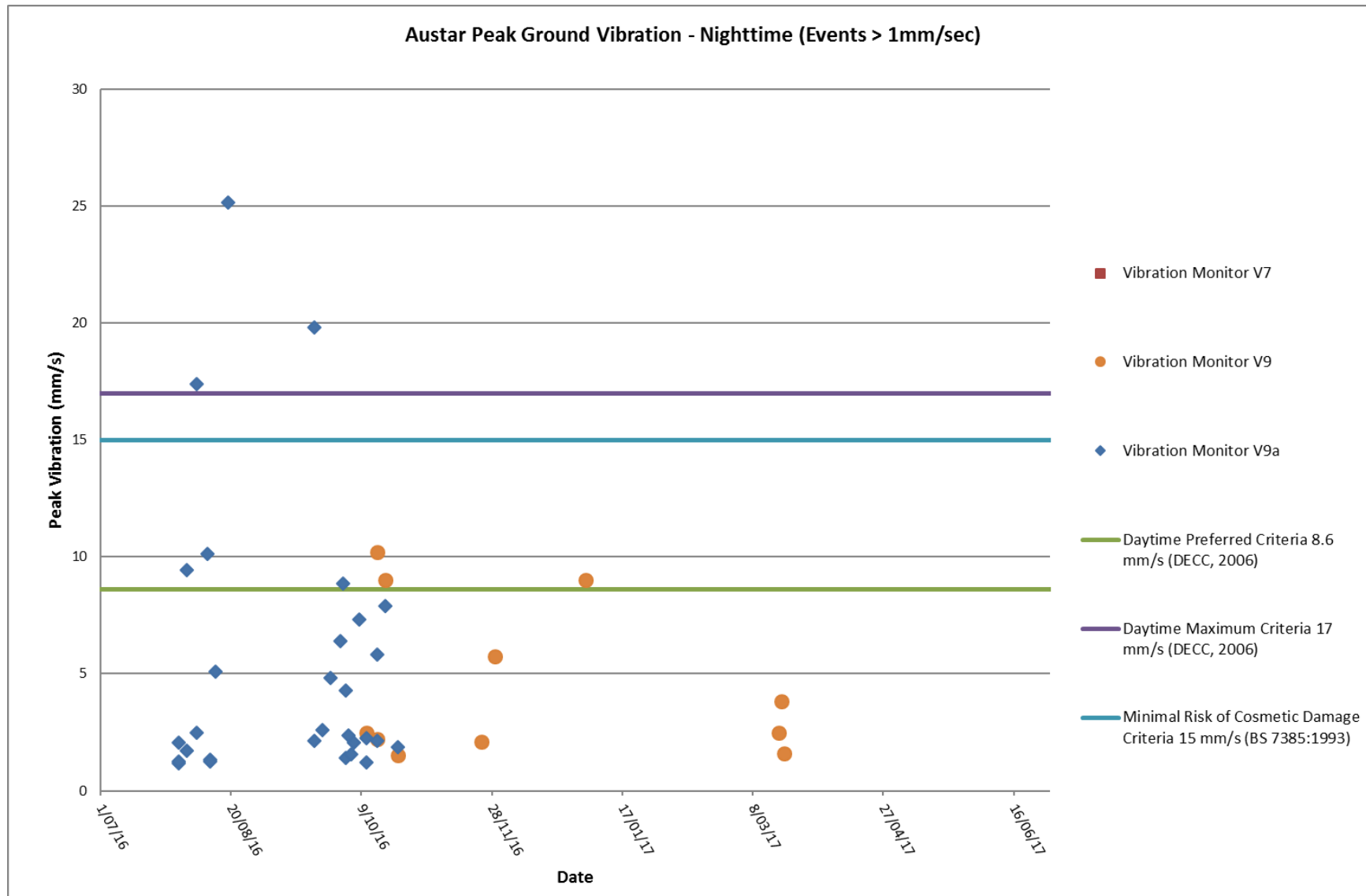
### Stage 2 Alluvial and Sandstone pH



# Appendix D:

# Vibration Monitoring Data

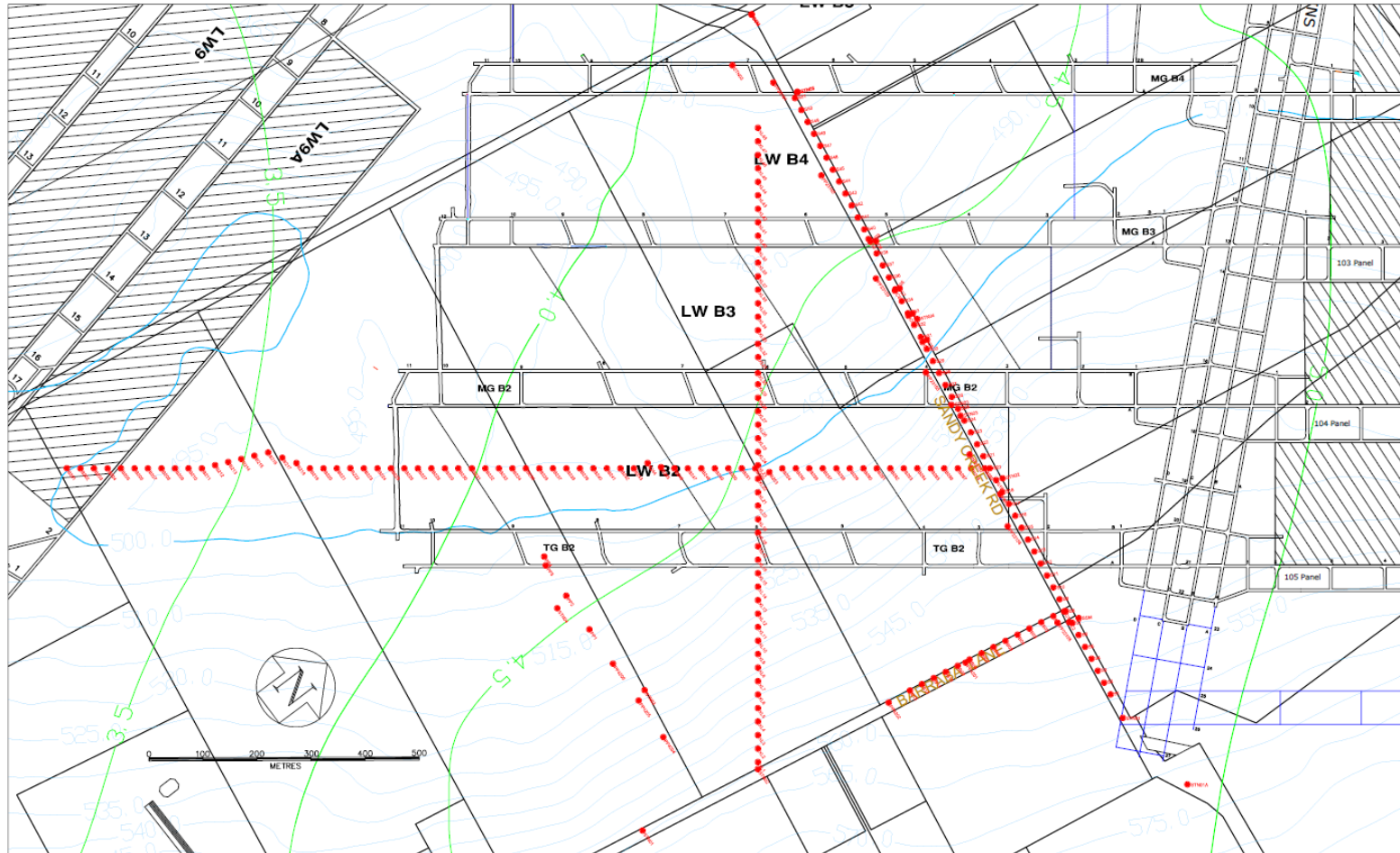








# Appendix E:

# Subsidence Monitoring Data

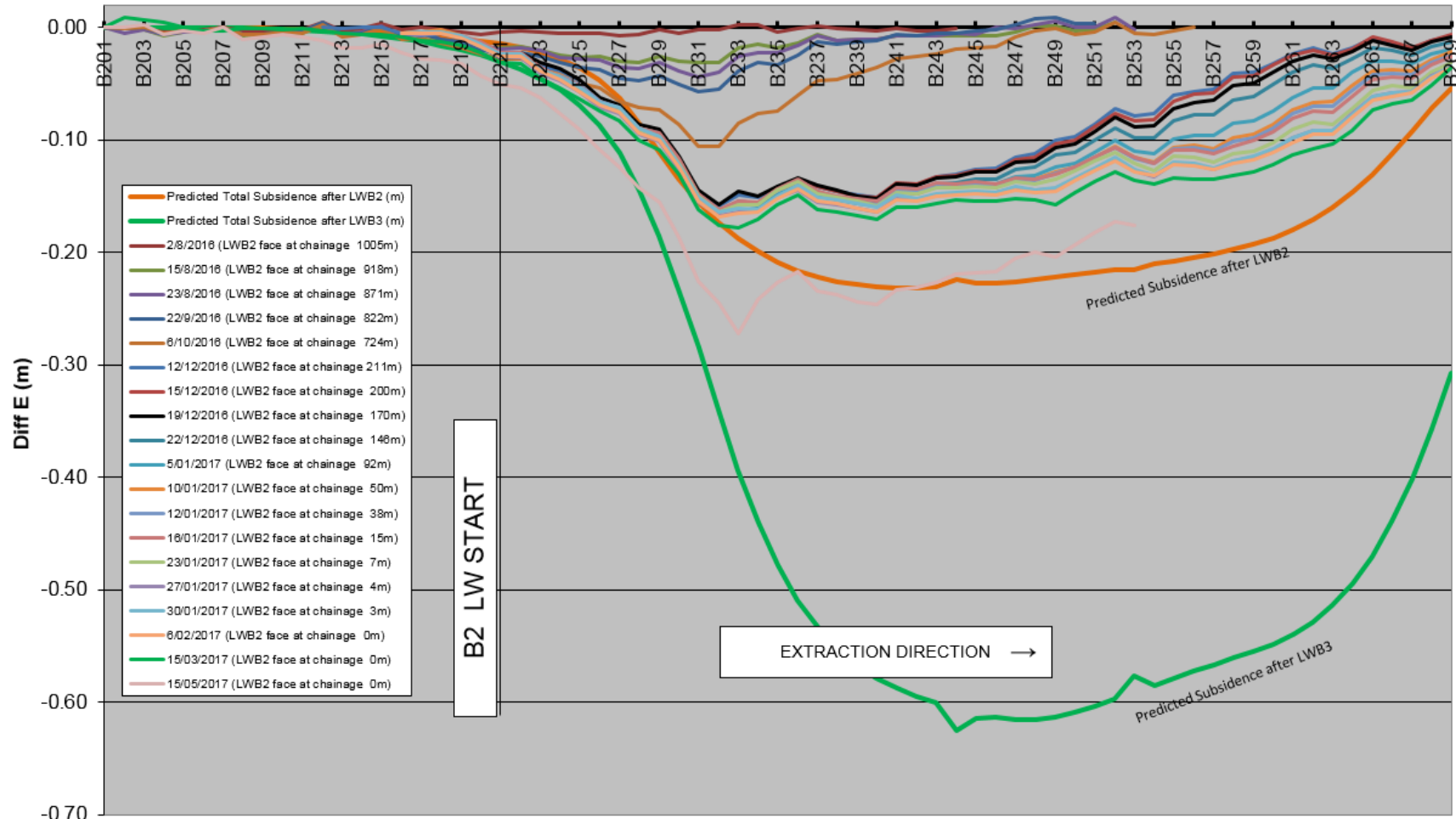




<b>LEGEND:</b>  5.6 ..... Full Seam Thickness (Metres)  490 ..... Depth of Cover (Metres)  B238 ..... Subsidence Marks	DRAWN M. Wright	<b>AUSTAR COAL MINE</b>	
	DATE 4/5/17	TITLE Subsidence Monitoring Locations	
	APPROVED	SCALE NTS	DRAWING No. B2 Centreline.dwg
			

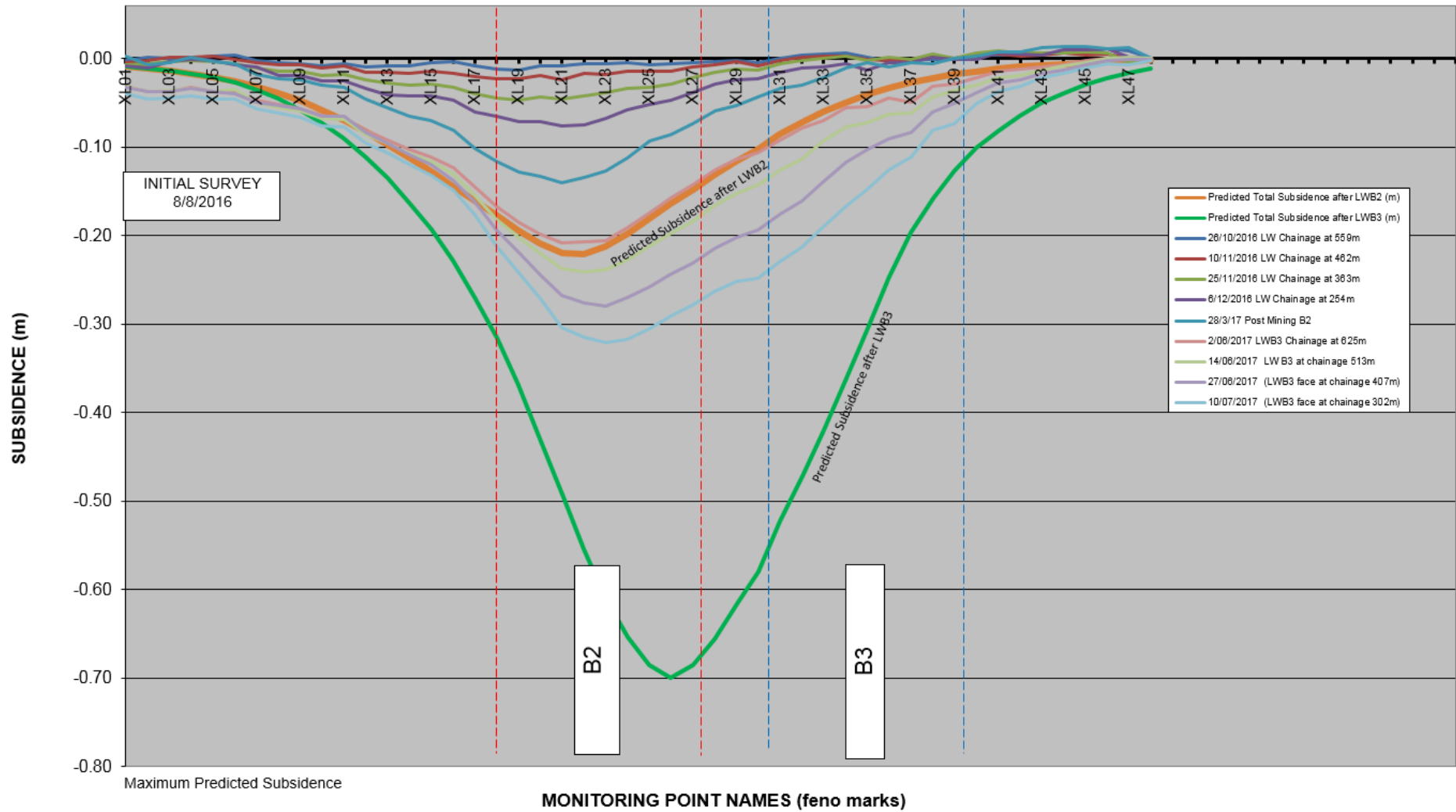
**Subsidence- LINE "B2"**

INITIAL SURVEY 4/7/2016

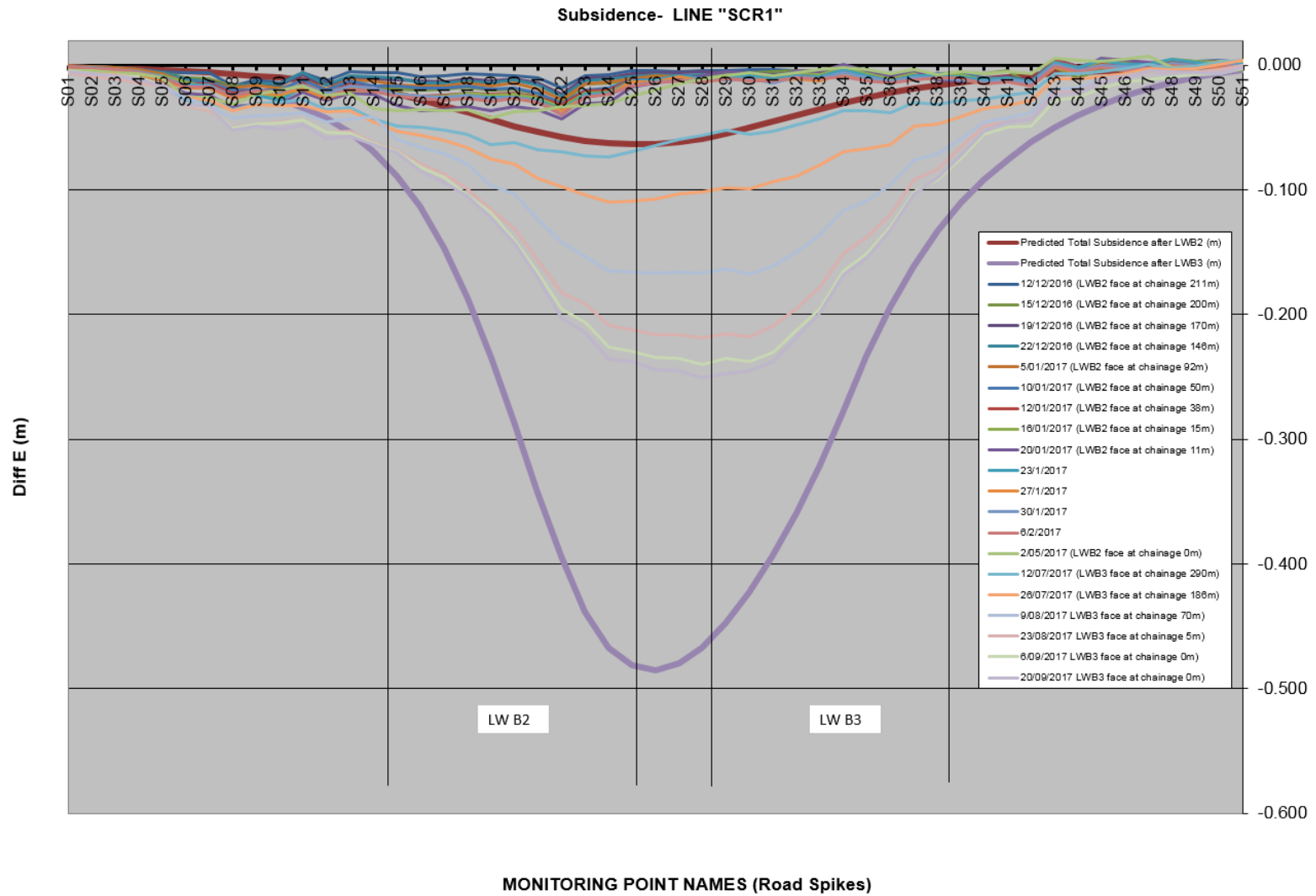


MONITORING POINT NAMES (Feno marks)

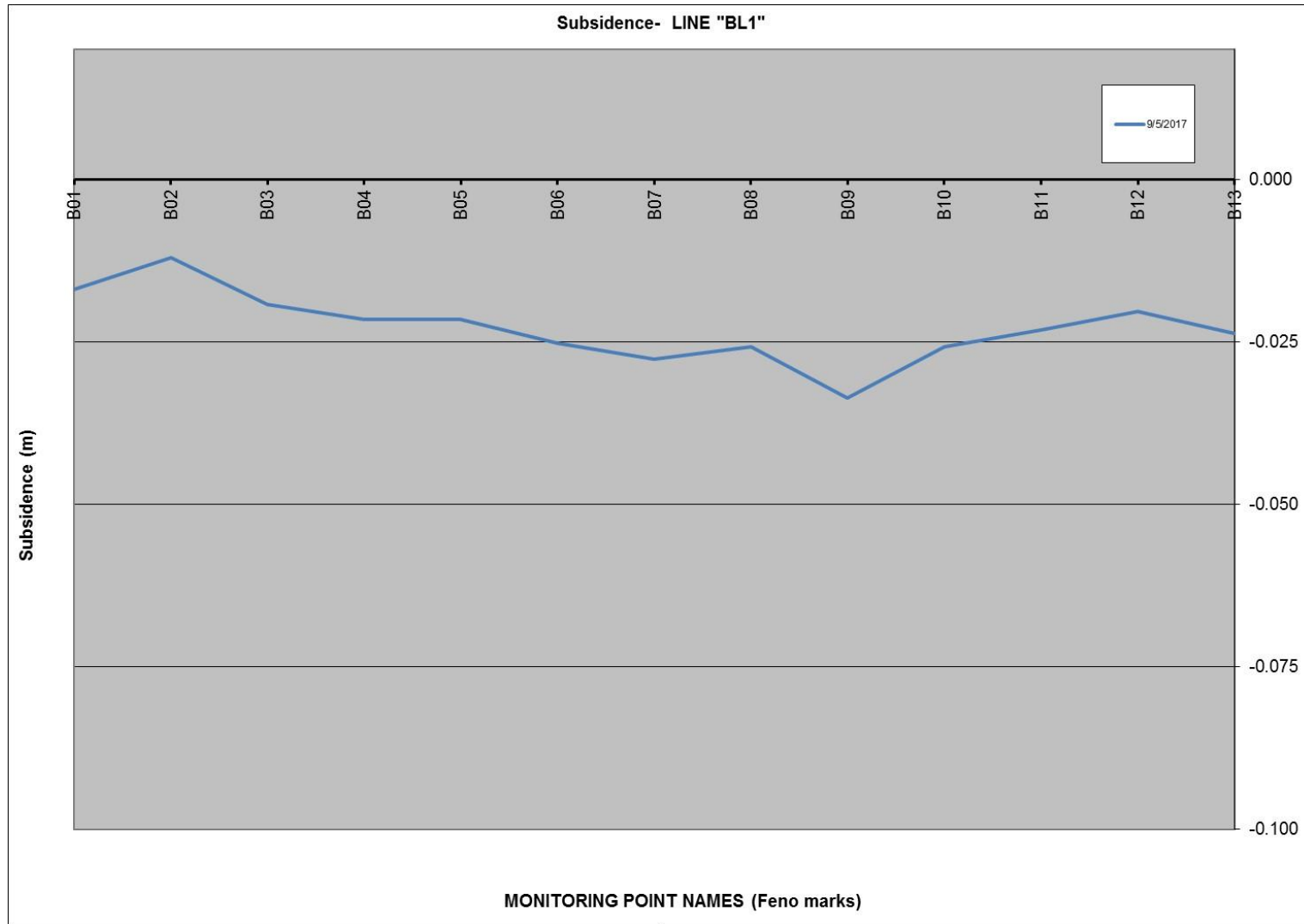
**SUBSIDENCE Bellbird South Crossline**



### Sandy Creek Road Subsidence Monitoring



Barraba Lane Subsidence Monitoring



# Appendix F:

# Community Complaints

**Austar Coal Mine Community Complaints Register  
July 2016 to June 2017**

Complaint No	Category	Date	Property	Detail	Follow Up Actions
1	Vibration	26/09/2016	Barraba Lane, Quorrobolong	Potential damage to residential property in the Bellbird South mining area.	Environment and Community Manager (ECM) met with the resident on the day of complaint and provided an update on the longwall position, subsidence monitoring and vibration monitoring results. The ECM advised the resident that Austar has been in contact with the Mine Subsidence Board (MSB) to discuss the vibration levels and potential impact to residential properties. ECM provided the resident with the MSB claim form and relevant MSB contact details.
2	Odour	17/10/2016	Clare St, Cessnock	The resident called regarding an odour thought to be originating from Aberdare Emplacement Area on the previous night. The resident asked whether there had been any fertiliser spread in the area recently. ECM advised there had not been any fertiliser spread in the area.	ECM contacted CHPP personnel. Reject truck operators had identified an odour in the morning and arranged for water truck to wet the area down. ECM visited the emplacement area and observed wetting down occurring. CHPP personnel had also arranged for piles to be spread with dozer and rolled on 18/10/16. The resident was advised of the outcomes of investigation and the actions undertaken. The resident appreciated the call.
3	Odour	18/10/2016	Cessnock	ECM called back at 9:20am. The resident advised there was an odour from Aberdare Emplacement Area.	ECM advised the resident that the issue had been identified by Austar personnel the previous day and that we had immediately arranged for water truck to wet the area down. ECM advised that the CHPP personnel had arranged for piles to be spread with dozer and rolled on 18/10/16 which will address the issue. The resident appreciated the call back.
4	Odour	18/10/2016	Clare Street, Cessnock	The resident advised there was an odour from Aberdare Emplacement Area. The resident also advised there he has to clean dust from his outside areas on occasion.	ECM advised the resident that the issue had been identified by Austar personnel the previous day and that we had immediately arranged for water truck to wet the area down. ECM advised that the CHPP personnel had arranged for piles to be spread with dozer and rolled on 18/10/16 which will address the issue. For the dust issue, the resident was advised that we operate water carts when reject trucks are operating, and the coarse reject forms a crust and does not generate significant dust, other sources of dust include motorbikes that use the adjacent bush tracks. The

**Austar Coal Mine Community Complaints Register  
July 2016 to June 2017**

Complaint No	Category	Date	Property	Detail	Follow Up Actions
					timing for filling and rehabilitation of Aberdare was discussed, and the resident appreciated the discussion.
5	Water - surface	25/2/17	Sandy Creek Road, Quorrobolong	Resident attended the Mine Control Room approximately 8:50pm and made complaint regarding Austar employees entering his property without first asking on 24/2/17, and a water discharge which may originate from a mine pipeline which has affected part of his property.	At 9:00pm the Austar Coal Mine Environment & Community Manager (ECM) contacted resident by phone and advised that an incident was identified in a road reserve on Friday afternoon 24/2/17 afternoon and Austar employees inspected the road reserve. ECM advised that at no time did any Austar employee cross any fencelines for the inspection. The resident still did not agree with this advising his wife had observed men in orange shirts on their property from her house (the house is approx 500m from the inspection area). Resident also advised that water was on his property, and was concerned about possible impact to stock. ECM advised that the extent of water onto his property must have not been observed during inspection. ECM offered to meet with resident on Monday morning to inspect and offered to erect fencing to exclude stock. Resident agreed. On 27/2/17 Austar met with resident's wife who showed Austar personnel wet area. Austar agreed to fence the area and this was completed on 27/2/17. Austar arranged for remediation of his property after the source of incident was rectified.



# Appendix G:

# Environmental Incidents

## Austar Coal Mine 2016-2017 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
1	22/07/2016	Reportable noise exceedances from the CHPP was identified at two (2) locations during routine noise monitoring on 22 July 2016 due to the low frequency modifying factor. A review of meteorological data on 22/07/16 indicated that noise limits were applicable at the time of monitoring. There was no community complaints at the time of the measured exceedance.	<p><b>Immediate Actions:</b> EPA &amp; DPE were notified once it was confirmed that the noise limits were exceeded on 22/7/16.</p> <p><b>Follow up Actions:</b> Follow up monitoring arranged to occur when CHPP operating and weather conditions suitable; Review of previous reports on CHPP site for potential noise control options and potential low frequency sources (to be subject to reasonable/feasible test); an incident report was submitted to EPA &amp; DPE on 29/7/16.</p>
2	03/08/2016	Follow up monitoring was undertaken in response to previous noise exceedance on 22/07/16 at two (2) locations. Noise exceedances at both locations was confirmed on 03/08/2016 due to the addition of the 5dB low frequency modifying factor as per the current Industrial Noise Policy. There was no community complaint at the time of the measured exceedance.	<p><b>Immediate Actions:</b> EPA &amp; DPE notified once exceedances were confirmed and incident reports were submitted to EPA and DPE.</p> <p><b>Follow up actions:</b> Follow up monitoring arranged to occur when CHPP operating and weather conditions suitable, A review of previous reports on CHPP site for potential noise control options and potential Low Frequency sources (to be subject to reasonable/feasible test) - has commenced, a review of Premises Noise Assessment prepared in 2014 for the CHPP has been requested to update with low frequency noise monitoring findings.</p>
3	09/08/2016	Follow up monitoring was undertaken in response to previous noise exceedance on 22/07/16 and 03/08/2016 at two (2) locations. Noise exceedances was identified at one location with the other being within relevant noise limits. There was no community complaint at the time of the measured exceedance.	<p><b>Immediate Actions:</b> EPA &amp; DPE notified once exceedances were confirmed and incident reports were submitted to EPA and DPE.</p> <p><b>Follow up actions:</b> Follow up monitoring arranged to occur when CHPP operating and weather conditions suitable. A review of previous reports on CHPP site for potential noise control options and potential Low Frequency sources (to be subject to</p>

### Austar Coal Mine 2016-2017 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
			reasonable/feasible test) - has commenced, a review of Premises Noise Assessment prepared in 2014 for the CHPP has been requested to update with low frequency noise monitoring findings.
4	05/09/2016	One reportable noise exceedance from the CHPP was identified at one location during routine noise monitoring on 29/8/16 due to low frequency modifying factor. Weather data analysis was completed on 5/9/16 which confirmed the exceedance. There was no community complaint at the time of the measured exceedance.	<p><b>Immediate Actions:</b> EPA &amp; DPE notified of exceedance on 5/9/16.</p> <p><b>Follow up Actions:</b> Continue with actions established from previous noise exceedances (monitoring to occur when CHPP operating and weather conditions suitable, continue potential noise control options and potential Low Frequency sources (to be subject to reasonable/feasible test), review Premises Noise Assessment prepared in 2014 for the CHPP to update with low frequency noise monitoring findings), prepare incident report to EPA &amp; DPE by 12/9/16.</p>
5	10/09/2016	Spill to land: During routine inspection of the No. 2 shaft pipeline by the shift engineer, a wet area was identified above the pipeline in a section of Crown Road as a potential leak.	<p><b>Immediate Actions:</b> The pipeline was isolated, E&amp;C Manager and Manager Mechanical Engineering were notified.</p> <p><b>Follow up Actions:</b> Crown Lands and near neighbour were notified of maintenance activities on the pipeline. Pipeline investigation works commenced 12/9/16 and repair was completed by engineering on 21/9/16 without further incident.</p>
6	01/11/2016	Minor spill of mine water to land from an air relief valve in the No. 2 shaft compound.	<p><b>Immediate Actions:</b> Air relief valve isolated.</p> <p><b>Follow up Actions:</b> Air relief valve replaced.</p>
7	04/11/2016	Minor spill of mine water to land from No. 2 Shaft pipeline air bleed valve on hill near Kalingo Dam during the restart of the pipeline. Upon inspection a leak from a faulty air bleed valve was identified with an area of ground near the faulty valve.	<p><b>Immediate Actions:</b> All air bleed valves were immediately isolated on the pipeline and a procedure for manual air bleed was initiated to permit continued operation of the pipeline until further investigation of the air bleed valves could be undertaken.</p>

### Austar Coal Mine 2016-2017 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
			<b>Follow up Actions:</b> New air bleed valves were procured by engineering and installed.
8	06/12/2016	No. 2 shaft pipeline leak causing wet area of land found during a pipeline inspection, confirmed likely to be mine water.	<b>Immediate Actions:</b> Pumps was immediately switched off. Investigation of leak commenced 06/12/2016 by excavation was located 09/12/2016.  <b>Follow up Actions:</b> Pipe welding repair completed and pump restarted 09/12/2016
9	24/02/2017	Mine water leak form No. 2 shaft pipeline to road reserve, small area of private paddocks and pools of water near road culverts. Reported to Austar by resident 2.42pm 24/02/2017.	<b>Immediate Actions:</b> No. 2 shaft pumps were switched off by control room and valves isolated. Incident area was inspected and assessed from 3.01pm. Incident triggered the Pollution Incident Response Management Plan at 3.42pm. EPA and other agencies notified. Containment pumping of the pooled water was arranged and commenced by 5.30pm. Landowners and private paddocks and Council were notified of potential leak and future remediation works once leak has been repaired.  <b>Follow up Actions:</b> Investigation of the leak via excavations commenced on 28/02/2017. Leak was repaired on 08/03/2017. Remediation works on private paddocks and Council commenced 27/03/17, with remediation works finished 27/04/17, delay due to heavy rainfall. EPA issued a 'Show Cause' notice on 27/04/17, with Austar responding 05/05/2017.
10	01/03/2017	Tailings leak at the CHPP site. Tailings sprayed to ground and in Austar gravel road table drain adjacent the overland conveyor, originating from a failed gasket at a pipe fitting.	<b>Immediate Actions:</b> Earthen containment bund installed, tailings spray area cleaned up. Tailings spray was observed adjacent to an existing containment bund (over an area of 10m x 10m), and in an internal gravel roadside drain approx. 20m from the tailings bund. The internal roadside drain leads to a dam which then would flow to the clean water system. Incident assessed which determined the incident may class as a "pollute waters" incident, but would not

### Austar Coal Mine 2016-2017 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
			<p>cause the incident to trigger the Pollution Incident Response Management Plan. The incident will be reportable in the Environment Protection Licence Annual Return. A communication was sent to Austar's EPA officer with a summary of the incident and our proposed treatment of reporting.</p> <p><b>Follow up Actions:</b> The CHPP checked and adjusted all bolted pipeline joints where necessary, a hooded cover was fitted at each earth containment bund to prevent spray from releasing over the bund and an additional float switch was installed in each bund as a redundancy.</p>
11	20/03/2017	Diesel staining was observed at the No. 2 shaft site when the roads dried out after rainfall, the stains could not be seen when the road was wet. The initial investigation found that a waste contractor's vacuum truck which supported the incident site was identified as the source of the leak. The leak caused stains on the gravel and bitumen road. A pinhole leak in contractor's diesel tank was not identified during pre-start inspections.	<p><b>Immediate Actions:</b> Contractor repaired leak once it was identified offsite.</p> <p><b>Follow up Actions:</b> Diesel stains were attended to with spill kit on sealed road, and by scraping gravel road surface and disposal. Waste contractor arranged for licenced removal of soils. Austar followed up with the contractor to ensure the repair had been made.</p>
12	09/05/2017	Noise levels measured at the CHPP were below EPL noise limits at all locations; however as per the Industrial Noise Policy methods, noise at four (4) locations attracted the low frequency modifying factor, which resulted in two (2) locations exceeding the relevant EPL noise limits by 1-2dB, which is greater than the Noise and Vibration Management Plan limit, although not considered a non-compliance at the two locations. A review of meteorological data on 09/05/2017 indicated the noise limits were applicable at the time of monitoring.	<p><b>Immediate Actions:</b> EPA &amp; DPE notified once exceedance was confirmed on 9/5/17.</p> <p><b>Follow up Actions:</b> Follow up monitoring occurred on 16/5/17 which complied with noise limits (DPE and EPA were advised). On site measurements to continue noise control options and potential Low Frequency sources was already scheduled to occur on 10/5/17.</p>
13	06/06/2017	Orange staining/residue was observed in a clean water drainage line at the CHPP site. The drainage line is ephemeral and mainly dry with some pool areas. At the time of the identification, it was unclear whether the source of the staining/residue was from a source on site	<p><b>Immediate Actions:</b> Containment activities were implemented as a contingency. Water sampling and further field investigation undertaken. EPA requested a written report once laboratory results were received. Written report provided to EPA, DPE, DRG on</p>

### Austar Coal Mine 2016-2017 Environmental Incidents

Incident No.	Date	Incident Details	Follow Up Actions
		<p>or some other source unrelated to mining. Based on inspections on 6/6/2017 and the nature of the drainage line it was considered that there was not likely to be harm to ecosystems beyond a trivial level. Despite not yet understanding how the staining has entered the drainage line, the appearance of the water/staining was treated as it could potentially be from Austar. Austar considered costs of containment and clean up on the morning of 7/7/17 and believed these costs could exceed \$10,000. On that basis and the definition of Material Harm in the POEO Act, the Pollution Incident Response Management Plan was triggered and agencies notified as required by this plan.</p>	<p>21/6/17.</p> <p><b>Follow up Actions:</b> Austar commenced a monitoring program to investigate the source of the orange staining / residue, and advised the regulators. This is in progress and involves:</p> <ul style="list-style-type: none"> <li>• Maintaining the containment locations at the installed earthen bund during the investigations, and at Doyle Street Dam (as required);</li> <li>• Undertaking a flushing approach to the drainage line where the orange staining/residue was mainly observed (upslope of the earthen containment bund) with the intent to wash away the staining/residue to the containment bund and pump the collected water to Austar's mine water system;</li> <li>• Monitoring after completion of the flushing approach for possible location of a source of the orange staining / residue.</li> </ul> <p>This process was ongoing at the end of the AEMR period in consultation with the EPA, with updates provided to DPE and DRG.</p>
14	14/06/2014	<p>Noise levels measured at the CHPP were below EPL noise limits at all locations; however as per the Industrial Noise Policy methods, noise at four (4) locations attracted the low frequency modifying factor, which resulted in two (2) locations exceeding the relevant EPL noise limits by 1-2dB, which is greater than the Noise and Vibration Management Plan limit, although not considered a non-compliance at the two locations. A review of meteorological data on 14/06/2017 indicated the noise limits were applicable at the time of monitoring.</p>	<p><b>Immediate Actions:</b> EPA &amp; DPE notified once exceedance was confirmed on 14/6/17.</p> <p><b>Follow up Actions:</b> Follow up monitoring occurred on 22/6/17, further follow up monitoring to occur in July 2017. Incident report provided to EPA &amp; DPE on 21/6/17.</p>

# Appendix H:

# Statement of Compliance

In accordance with the *Annual Review Guideline* (DPE, September 2013), The AEMR / Annual Review is required to include a statement of compliance that highlights the status of compliance with the relevant approval conditions, as at the end of the reporting period. These tables are provided below.

**Table H1 - Statement of Compliance**

Were all the conditions of the relevant approval(s) complied with?	
DA 29/95	No
PA 08_0111	No
EPL 416	No

**Table H2 - Non-Compliances**

Relevant approval	Condition #	Condition description (summary)	Compliance Status	Comment	Where addressed in AEMR
DA 29/95 PA08_0111 EPL416	Schedule 3 Condition 20  Schedule 4, Condition 7  M4.1	Meteorological station	Non-compliant	During the 2016-2017 AEMR period, data from the Austar meteorological station was reviewed and data backed up on an interim and monthly basis. During the end of month download of February 2017, an issue was identified with the data storage which included rainfall and temperature. The meteorological station had stored data up to the 17/02/2017 then ceased storing data for a period of 11 days, the meteorological station commenced downloading data as of the 1 March 2017 after the Environment and Community Coordinator routinely checked the station and it was found to be operating normally after that time during the 2016-2017 reporting period. Austar will continue to download the data on an interim fortnightly and monthly basis to monitor and prevent data loss.	<b>Section 3.3.2</b>



Relevant approval	Condition #	Condition description (summary)	Compliance Status	Comment	Where addressed in AEMR
08_0111  EPL416	Schedule 4 Condition 2(b)  Condition U2.1	Noise and Vibration	Non-compliant	<p>As per the Industrial Noise Policy (INP), the nature of the measured noise indicated that C2 and C5 in quarter 3 of 2016, and C2, C3, C4, C5 in quarter 2 2017 were classified as low frequency and attracted the 5dB modifying factor. When the modifying factor was applied the resultant noise level exceeded the relevant EPL or the adopted Noise and Vibration Management Plan LA90 noise limit. No atypical operations were occurring at the CHPP during the monitoring events. A review of the existing meteorological data indicated that noise limits were applicable at the time of monitoring.</p> <p>Austar notified the EPA and DPE. Austar reviewed previous reports on the CHPP for potential noise control options and potential low frequency sources, Austar also carried out follow up monitoring when the CHPP was in operation and the weather conditions suitable. Incident reports were submitted to the EPA and DPE. Austar has been undertaking a voluntary noise pollution reduction program in consultation with the EPA for several years and will continue to do so in the next reporting period.</p>	<b>Section 3.11.2</b> <b>Appendix G</b>
DA29/95  PA08_0111  EPL416	Schedule 3 Condition 5  Schedule 4 Condition 8  L1.1	Water incidents	Non-compliant	<p>There were two (2) surface water environmental incidents which were reportable (comprising reportable leak from a mine water or tailings pipeline), and one potential environmental incident which was reported on suspicion during the AEMR period.</p>	<b>Section 3.5.2</b> <b>Appendix G</b>

**Table H3 – DPE Compliance Status Key for Table H2 (from DPE Annual Review Guideline, 2013)**

Risk level	Colour code	Description
<b>High</b>	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
<b>Medium</b>	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>• potential for serious environmental consequences, but is unlikely to occur; or</li> <li>• potential for moderate environmental consequences, but is likely to occur</li> </ul>
<b>Low</b>	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> <li>• potential for moderate environmental consequences, but is unlikely to occur; or</li> <li>• potential for low environmental consequences, but is likely to occur</li> </ul>
<b>Administrative non-compliance</b>	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)